

The
CATHOLIC
FAITH
& SCIENCE



Practical Resources for Modern Classrooms

ROBERT SPITZER, S.J., PH.D.

SOPHIA INSTITUTE FOR TEACHERS

The
CATHOLIC
FAITH
& SCIENCE

*Practical Resources for
Modern Classrooms*

About Sophia Institute for Teachers

Sophia Institute for Teachers was launched in 2013 by Sophia Institute to renew and rebuild Catholic culture through service to Catholic education. With the goal of nurturing the spiritual, moral, and cultural life of souls, and an abiding respect for the role and work of teachers, we strive to provide materials and programs that are at once enlightening to the mind and ennobling to the heart; faithful and complete, as well as useful and practical. Sophia Institute is a 501(c)(3) nonprofit organization founded in 1983.

About Magis Center

Fr. Robert Spitzer, S.J., Ph.D., the President and co-founder of Magis, is a Catholic priest in the Society of Jesus and former President of Gonzaga University. The Magis Center provides comprehensive and systematic responses to restore, reconstruct, and revitalize belief in God, the transcendent dignity of every person, the significance of virtue, the higher levels of happiness, love, and freedom, and the Real Presence of Jesus Christ.

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Lessons in this supplemental guide are taken from the catechetical series *Spirit of Truth* and from *Apologetics I: The Catholic Faith and Science*.

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About Magis Center

The mission of the Magis Center is to create content that helps people find higher purpose in life, an awareness of their transcendent dignity, a sense of the transcendent Providential Power who guides them, and a determination to live ethically responsible lives. To that end, the Magis Center produces and distributes media that provides contemporary commentary on timeless topics.

The Magis Center's partnership with Sophia Institute for Teachers opens new opportunities to help young people maintain their faith, and to turn the rising tide of unbelief through scientific and rational evidence.



How to Use This Guide

No textbook or teacher's guide can replace your own witness. Each and every day, offer students your own personal examples and stories. Most of all, pray often with your class. Sharing and modeling how to treat others with respect and charity will help them grow in understanding of how Christ calls us each to treat our neighbors and engage in the public square.

Each elementary and middle school lesson in this Teacher's Guide has a recommended grade range, but feel free to use them outside of these suggestions, and/or to adapt them for use with older or younger learners. Each lesson is designed as a supplement. Lessons are also designed to be self-contained, so that you may just as easily present a single lesson or all of them.

This guide also includes a complete unit from the High School course *Apologetics I: The Catholic Faith and Science*. We recommend presenting these lessons in the order they are presented here.

Each lesson includes:

- › Lesson overview, suggested grade level, learning goals
- › Connections to the *Catechism of the Catholic Church*
- › Activities and handouts
- › Scripture selections
- › Warm-ups
- › Formative assessments
- › Answer keys

Tips

- › You know best what your students already know, so keep that in mind when approaching warm-up exercises, which are meant to recall prior knowledge and/or create a mindset for the lesson.
- › Whenever possible, have students use their own copies of the Holy Bible to do readings.

A note on scriptural selections

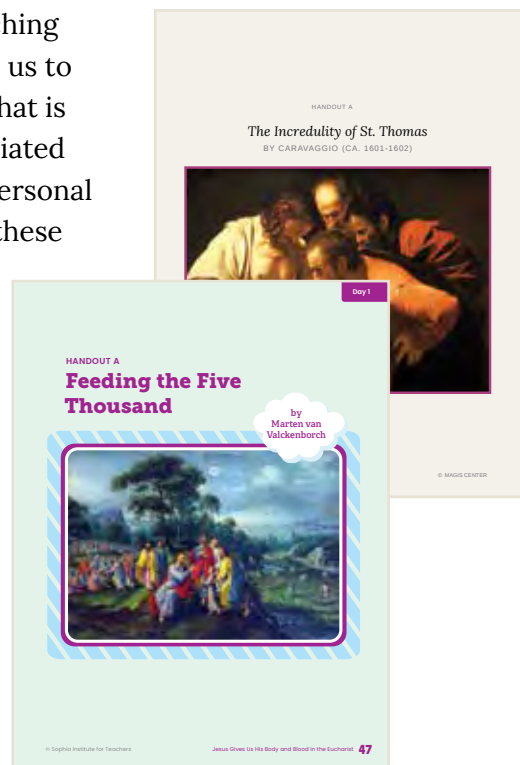
The translation of the Bible used in the Pre-K–5 lessons in this Teacher's Guide is the New American Bible, Revised Edition (NABRE). The translation of the Bible used in the middle and high school lessons is the Revised Standard Version, Catholic Edition (RSVCE). For the sake of readability on certain student handouts, we have removed biblical line breaks, line numbers, footnotes, and other references. Whenever possible, we encourage you to have students use their own copies of the Holy Bible to do readings.

Sacred Art and Catechesis

How to Use the Works of Art in This Guide

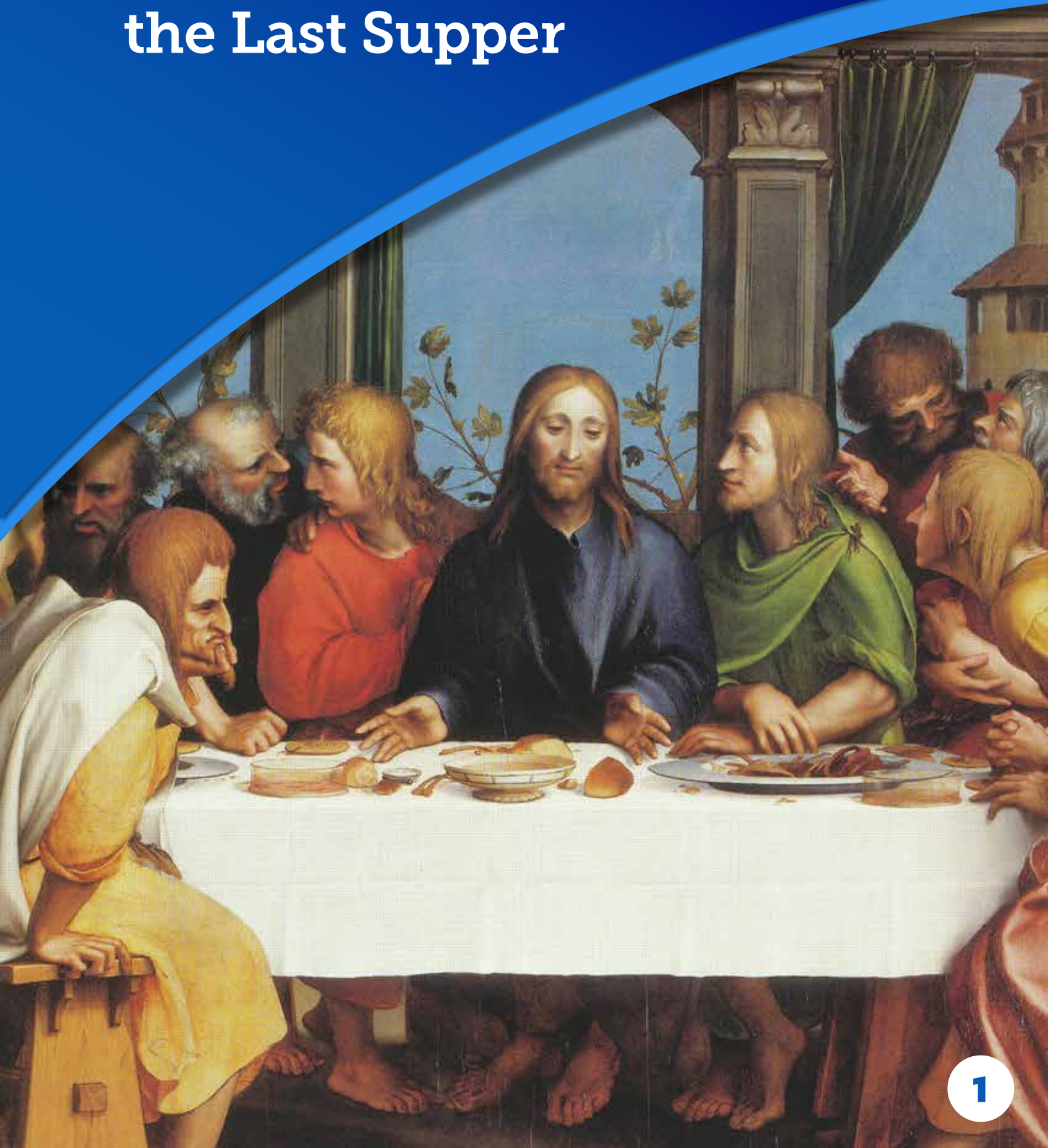
This Teacher's Guide uses sacred art as a means of teaching young people about the Catholic Faith. Beauty disposes us to the divine, and sacred art helps lead students to love what is good, beautiful, and true. Art can be viewed and appreciated by all students, no matter their grade, reading ability, personal background, or level of sophistication. Feel free to use these works of art with students of all grade levels. Add your own questions if these are too hard. Say them out loud if students cannot read the questions themselves. Have older students compose their own questions. Have fun.

- Before presenting artwork, we recommend you gather relevant Scripture passages and sections of the *Catechism* to contextualize discussion.
- We recommend projecting a full-screen image of each work of art, and/or handing out color copies for each student or small group of students.
- Allow students to view the art quietly for several minutes — or for as long as you can. Encourage them to appreciate it for its own sake before beginning any analysis.
- Begin your discussion by asking questions that are easy to answer. This may help “prime the pump” for future discussion.
- Be willing to share your own response to the painting. Allow your students to see the painting move you. Sharing the feelings and ideas the artwork evokes in you may encourage your students to be more willing to take risks in the ways they contribute to the discussion.
- Add your own favorite works of art. Don't be limited to paintings. Think about using sculpture, wood carvings, stained glass, and so forth. Your enthusiasm for works of art will be contagious.
- When appropriate, talk with your students about how sacred art, unlike other forms of artwork, is meant to draw our attention not the particularities of the figures in the work, but to universals: truth, beauty and goodness, and most of all, to the Author of beauty who is God Himself.



Pre-K–Gr. 2

Jesus Celebrated the Last Supper



Lesson at a Glance

Suggested Grade Level: Pre-K–2nd Grade



Learning Goals

- Jesus gave us the Eucharist at the Last Supper.
- He changed bread and wine into His Body and Blood.
- The Consecration is the part of the Mass in which the priest repeats the words that Jesus said at the Last Supper to change the bread and wine into His Body and Blood.
- Jesus is present in the Eucharist.
- St. Padre Pio was a holy priest.



Lesson Plan Chart

DAY 1

Warm-Up: Teacher guided activity

Activity: Handout A: The Last Supper Coloring Page

Formative Assessment: Teacher guided activity

DAY 2

Warm-Up: Teacher guided activity

Activity: Handout B: The Consecration

- *You will need: a chalice (real or made of paper) and a host made of card stock*

Formative Assessment: Handout C: The Holy Eucharist

- *You will need: a half-sheet of construction paper per student*

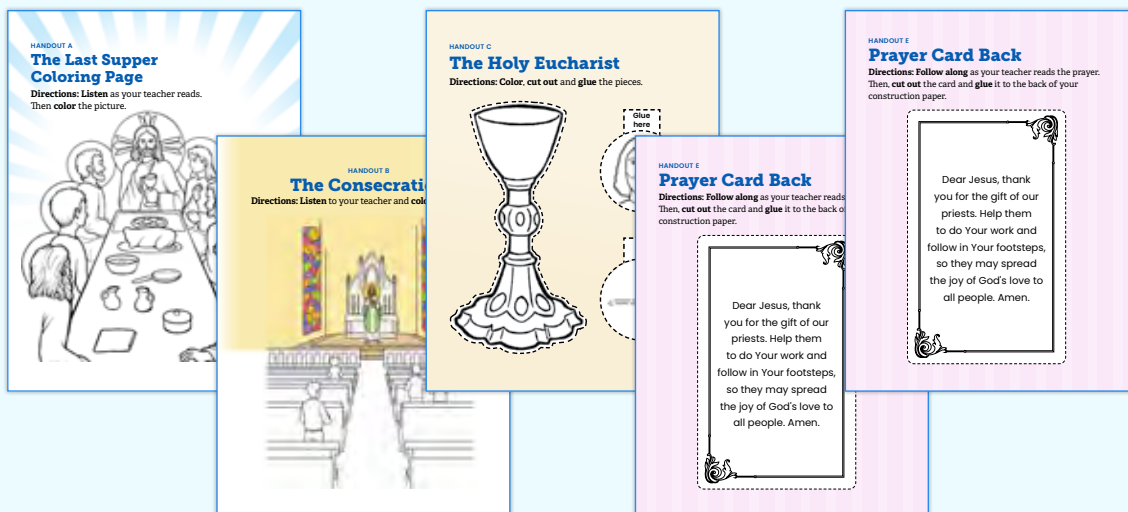
DAY 3

Warm-Up: Teacher guided activity

Activity: Teacher guided activity

Formative Assessment: Handouts D and E: Prayer Card Front/Back

- *You will need: a half-sheet of construction paper per student*



Connections to the *Catechism* in This Lesson

CCC 621, 611, 1323, 1337

Vocabulary Your Students Will Learn

- The **Last Supper** was the final meal Jesus shared with His Apostles.
- The **Consecration** is the part of the Mass where the priest uses the same words Jesus used at the Last Supper to change the bread and wine into the Body and Blood of Jesus Christ.

Key Scripture Passages

On the first day of the Festival of Unleavened Bread, the disciples came to Jesus and asked, "Where do you want us to make preparations for you to eat the Passover?"

—*Matthew 26:17-19, 26-30*

Prayer for This Lesson

Bless us, O Lord, and these thy gifts, which we are about to receive from your bounty, through Christ Our Lord. Amen.

Day 1

Warm-Up

- A.** Begin with the Sign of the Cross. Practice the prayer for this lesson, the grace before meals:




Bless us, O Lord, and these thy gifts, which we are about to receive from your bounty, through Christ Our Lord. Amen.

- B.** Ask your students to share a time they had a special meal with family or friends. It could be Thanksgiving, Christmas, birthday, and so forth.
- C.** Ask what made those meals special. *Answers could be because it was a special occasion, because it was with family, and so forth.*
- D.** Ask what special steps they or their parents took before the meal, such as cleaning the house, setting up the table and chairs, buying decorations, and so forth.

Activity

- A.** Tell your students that after Jesus entered into Jerusalem, He sent His disciples on an important errand: to prepare a room for the Passover feast.
- B.** Explain that Passover was a very important and special feast for the Jewish people. It celebrated a time long, long ago when God spared the lives of Jewish babies and freed the Jews from slavery in Egypt.



- C.** Distribute to your students **Handout A: The Last Supper Coloring Page**. Explain that this picture shows the Passover meal that Jesus shared with His disciples. It was the last time He would eat with them, so it is called the **Last Supper**.
- D.** Tell your students that we can read about the Last Supper in the Bible. The Bible is the story of God's love for us, and the Last Supper is a very special moment in that story. They may look at the picture in their workbooks while you read. **Read aloud**  **Matthew 26:19, 26-30:**



The disciples then did as Jesus had ordered, and prepared the Passover.

While they were eating, Jesus took bread, said the blessing, broke it, and giving it to his disciples said, "Take and eat; this is my body."

Then he took a cup, gave thanks, and gave it to them, saying, "Drink from it, all of you, for this is my blood of the covenant, which will be shed on behalf of many for the forgiveness of sins.

I tell you, from now on I shall not drink this fruit of the vine until the day when I drink it with you new in the kingdom of my Father."

Then, after singing a hymn, they went out to the Mount of Olives.

E. Cover the following with your students:

- At the Last Supper Jesus said some very special words. What are they? *This is my Body; this is my Blood.*
- Take a look at the bread and wine that Jesus is holding. Do they look like His Body and His Blood? They do not, but they really and truly are!
- How do you think Jesus could change bread and wine into His Body and Blood? *Help students see that Jesus is God and therefore all-powerful, the changing of bread and wine into His Body and Blood was a miracle.*

DAY 1 > Formative Assessment

A. There is a special word that we use for Jesus' Body and Blood under the appearance of bread and wine. We learned it earlier this year. Can anyone remember? *Eucharist (or students may also say Communion).*

B. Allow your students time to color the picture in their workbooks.

Day 2



Preparation before Class

Before class, have ready a gold chalice (make one out of paper if you cannot find a real one) and a host made out of cardstock.

Warm-Up

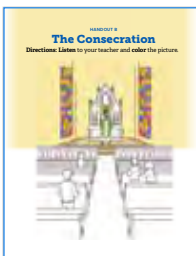
- A.** Begin with the Sign of the Cross. Lead your students in the prayer for this lesson:



Bless us, O Lord, and these thy gifts, which we are about to receive from your bounty, through Christ Our Lord. Amen.


- B.** Ask your students to recall the words Jesus spoke at the Last Supper. What did He do while He spoke those words? *He turned the bread and wine into His Body and Blood.*
- C.** Ask your students to recall the special word for Jesus' Body and Blood. *Eucharist.*
- D.** Jesus also said some other important words at the Last Supper. Yesterday we heard from the Gospel of St. Matthew. In the Gospel of St. Luke Jesus says, "Do this in memory of Me." (Luke 22:19) These are important words because Jesus was telling us to continue eating and drinking his Body and Blood, even after He went back to Heaven.
- E.** Ask your students where they think Catholics can receive the Eucharist. *At Mass.*

Activity



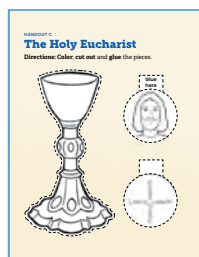
- A.** Distribute to your students **Handout B: The Consecration**. Point to the priest and tell your students that it is a priest, but also Jesus. At the Last Supper when Jesus said "Do this in memory of Me," He was telling His Apostles to turn bread and wine into His Body and Blood. Only very special people are able to do that, and we call them priests. The men at the Last Supper, the Apostles, were the first priests.
- B.** Explain to your students that at every Mass there is a special moment where the priest turns the bread and wine into Jesus' Body and Blood. This moment is the **Consecration**. Have your students repeat the word *Consecration* a few times. Allow your students to color the bottom half of the picture.
- C.** On a small table in front of you, lay out the chalice and the host. Point to and name each item. **Be sure to tell your students that these are only pretend**, not the real ones that the priest uses. The real chalice would have wine in it, and the real host would be bread made out of flour and water.

- D.** Allow your students to pass around the host and the chalice.
- E.** Tell your students that you are going to show them what the priest does at the Consecration. Again, **remind them that this is only pretend**; you are not a priest and so are not able to consecrate the bread and wine.
- F.** Lift the host off the table and repeat the words of Consecration: “Take this, all of you, and eat of it, for this is my Body, which will be given up for you.
- G.** Lift the host up into the air. Explain to your students that this is called the “Elevation” and that at Mass they would hear bells ring at the Elevation.
- H.** Return the host to the table, and lift the chalice slightly. Repeat the words of Consecration: “Take this, all of you, and drink from it, for this is the chalice of my Blood, the Blood of the new and eternal covenant, which will be poured out for you and for many for the forgiveness of sins. Do this in memory of me.”
- I.** Elevate the chalice and return it to the table.
- J.** If time permits, allow your students to take turns performing the actions of the Consecration and the Elevation while you say the words for them.

 **Invitation to Witness:** Share your awe and reverence for this miracle we are able to share in at every Mass. The bread and wine still look like bread and wine, but they truly become the Body and Blood of Jesus.

- K.** After you have shared your reverence for our Eucharistic Lord, share with the class that the act of transubstantiation is itself miraculous, but on very rare occasions, Eucharistic miracles have occurred. When a Eucharistic miracle happens, a consecrated host visibly becomes a piece of cardiac (heart) muscle tissue. You can share briefly about some of these events using information from the lesson on Eucharistic Miracles beginning on pg. 89 of this guide.

DAY 2 > Formative Assessment



- A.** Distribute to your students **Handout C: The Holy Eucharist** and give them time to color and decorate the chalice and picture.
- B.** Have your students cut out the host and glue the tab onto the picture. Show them how they can lift the host to reveal Jesus inside.
- C.** Glue the completed picture onto half a sheet of construction paper. Allow your students to take their pictures home and share what they learned about Jesus is truly in the Eucharist with their families.

Day 3

Warm-Up

- A.** Begin with the Sign of the Cross. Lead your students in the prayer for this lesson:




Bless us, O Lord, and these thy gifts, which we are about to receive from your bounty, through Christ Our Lord. Amen.

- B.** Ask your students to recall Jesus' words, "Do this in memory of Me." Ask them who Jesus was speaking to when He spoke these words. *To priests.*
- C.** Ask what special thing priests can do. *They can consecrate bread and wine and turn it into Jesus' Body and Blood.* You may have to review the word "consecrate." To consecrate something means to set it apart and make it holy.
- D.** Remind your students that Jesus gives priests the power to act just like Him. We should be very respectful to priests, because they are acting in the place of Jesus. Because Jesus is acting through the priest, priests can do many wonderful things! Jesus makes priests able to consecrate bread and wine, baptize people, forgive sins, witness people's marriages, bless people and objects, and much more! We should also pray for our priests so that they can do Jesus' work well and be holy.

Activity

- A.** Tell your students that today they are going to learn about a very special priest. He was such a good and holy priest that he became a saint. His name is Padre Pio. Padre is an Italian and Spanish word that means "Father," which is what we call priests.

- B. Read aloud**  the story of St. Padre Pio:



Pius of Pietrelcina, better known as Padre Pio, wanted to be a priest ever since he was about your age! His father was a poor farmer, but he worked extra hard so that his son could enter the seminary and become a priest.

As a young priest, Padre Pio struggled with his health. He was weak and often sick, but that never kept him from his prayers. One day Padre Pio was saying his usual prayers when a sharp pain stabbed through his hands and feet. The pain was so great that he fainted. When he woke up, he found that he, too, had been given the gift of the stigmata. That means that his hands and feet bore the same wounds that Jesus had suffered when He was nailed to the Cross.

God also worked many miracles through Padre Pio. When people came to him for confession, he would remind them of sins they had forgotten. Once, a little blind girl came to him for her First Confession and First Holy Communion. Afterward, he rubbed her eyes, and she could see!

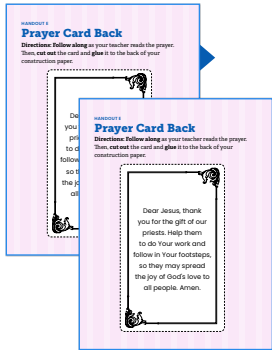
Padre Pio could also be in two places at the same time. Once, there was a concert at the monastery. A fellow monk noticed that during the intermission, Padre Pio remained seated in his chair and closed his eyes.



The next day, the monk visited a sick villager and discovered that the villager had been healed. The happy villager explained that Padre Pio had visited him the night before. Padre Pio had miraculously visited the villager while remaining in his chair!

St. Padre Pio, help my suffering remind others of Jesus!

DAY 3 > Formative Assessment



- A.** Distribute to your students **Handout D: Prayer Card Front** and have them trace the words, color the picture and cut it out.
- B.** Next, distribute to your students **Handout E: Prayer Card Back** and have them color and cut out the picture. Then, distribute to your students a half sheet of construction paper and have them glue the cutouts to the front and back of the construction paper. Invite your students to take their prayer cards home and share the Prayer for Priests with their families.

HANDOUT A

The Last Supper Coloring Page

Directions: Listen as your teacher reads.
Then **color** the picture.



HANDOUT B

The Consecration

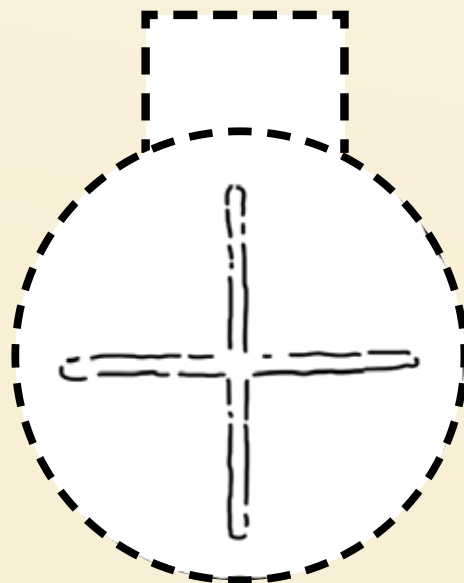
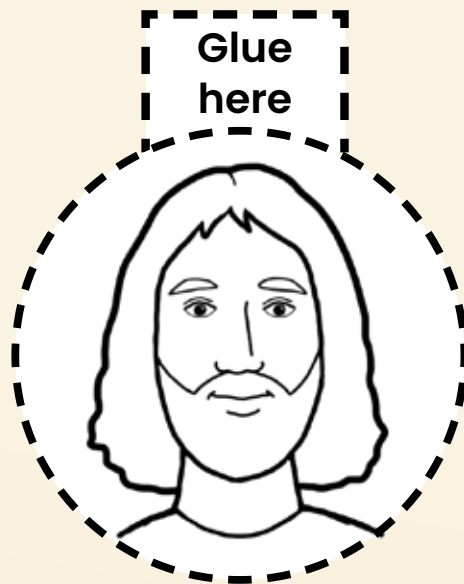
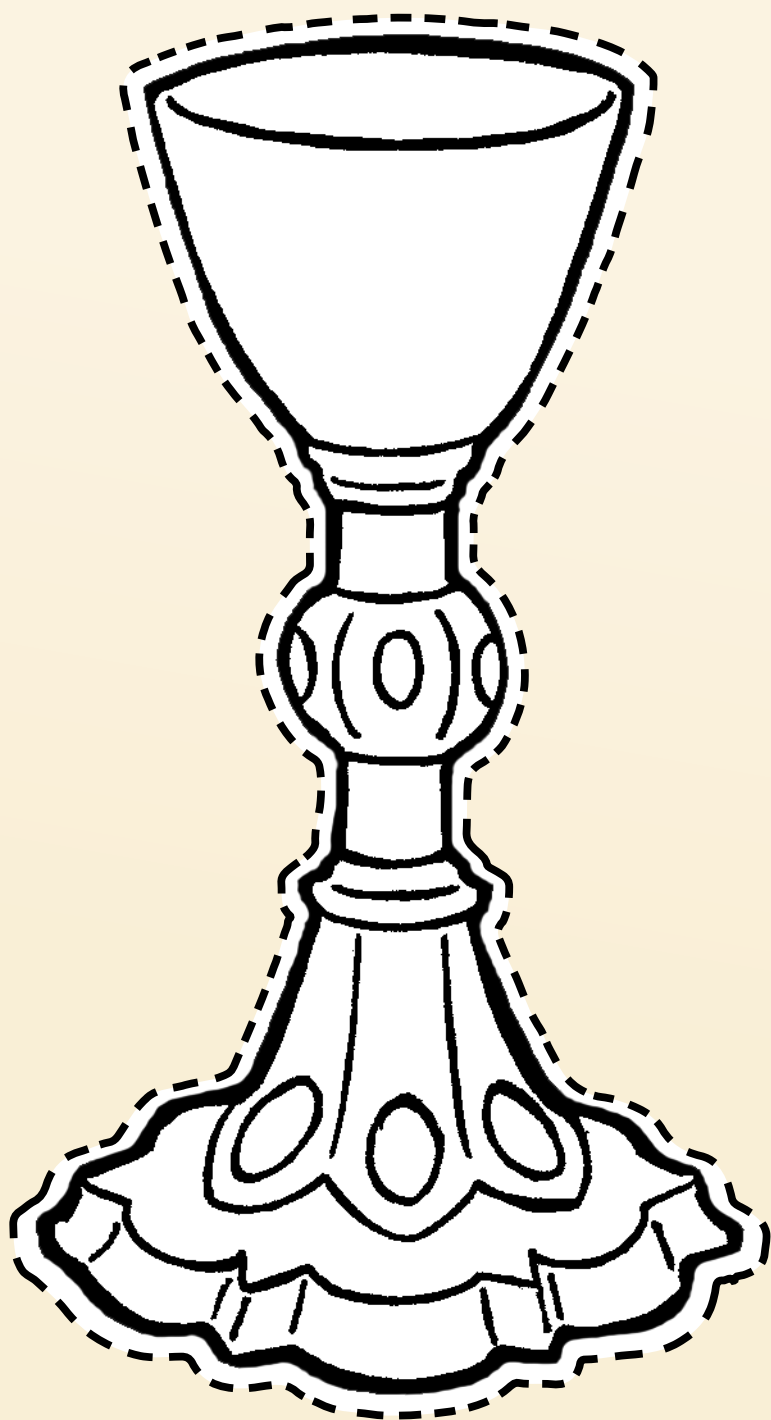
Directions: Listen to your teacher and **color** the picture.



HANDOUT C

The Holy Eucharist

Directions: Color, cut out and **glue** the pieces.



HANDOUT D

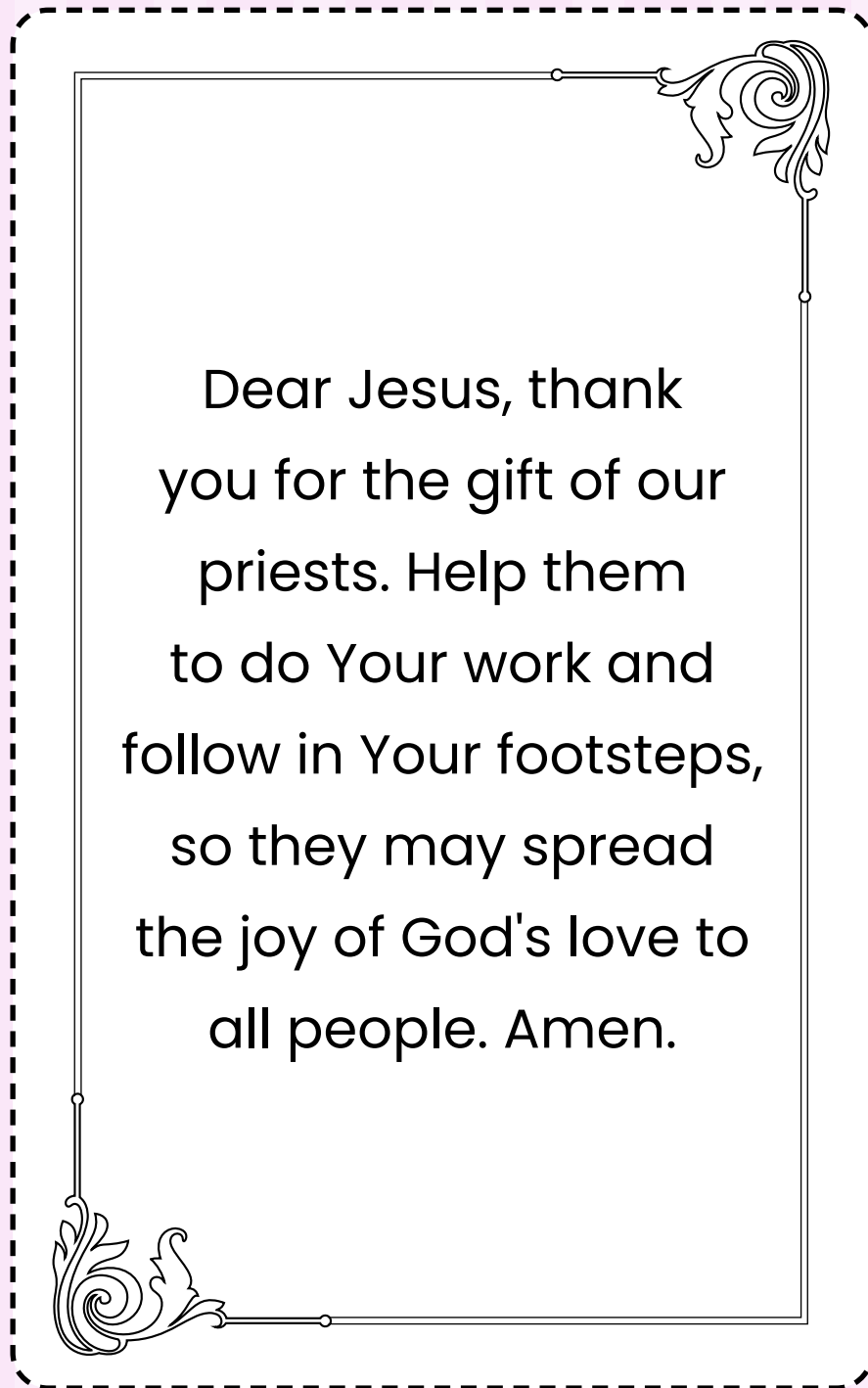
Prayer Card Front

Directions: Color and decorate the picture. Then, **cut it out** and **glue** it to the front of your sheet of construction paper.



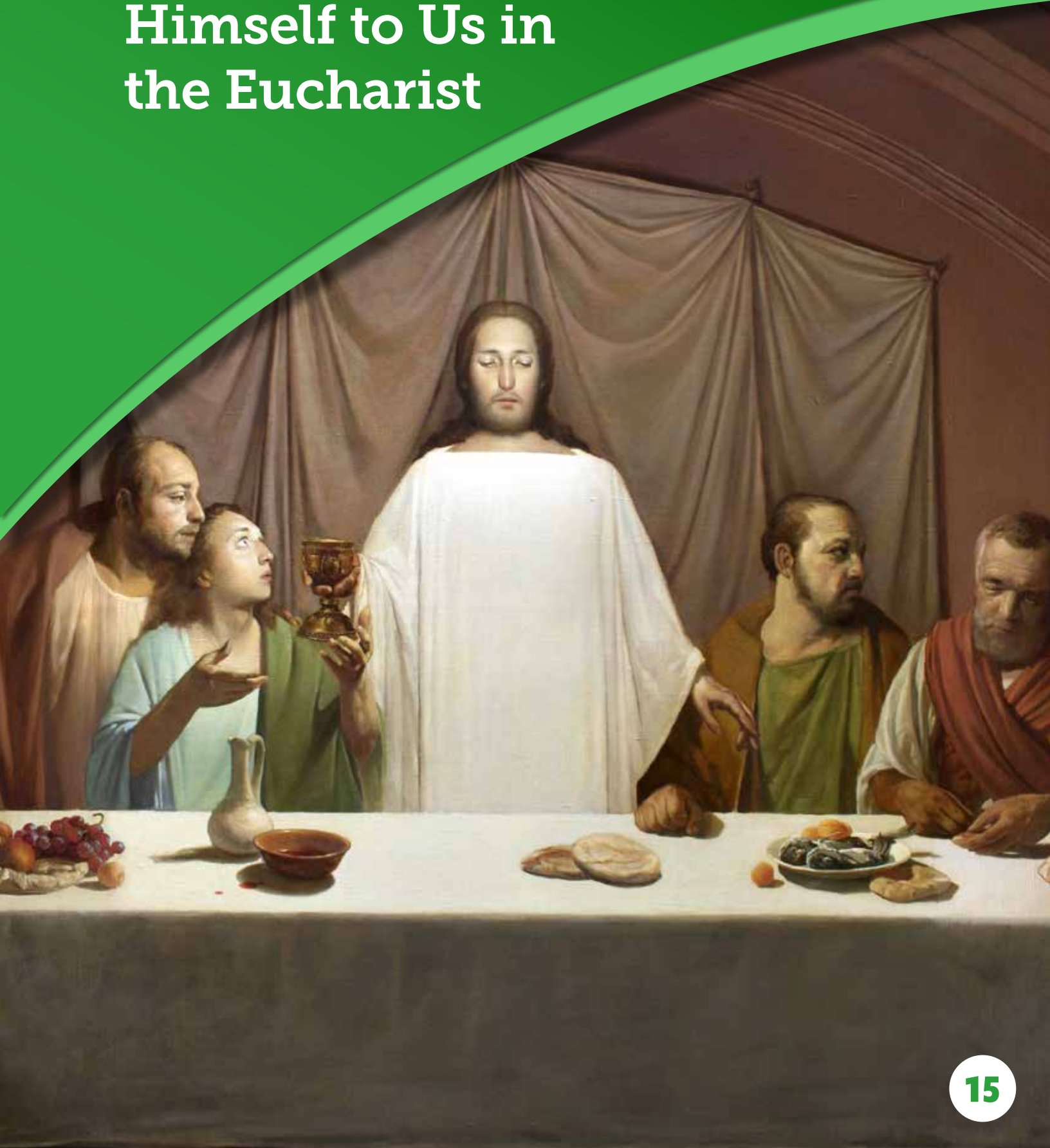
Prayer Card Back

Directions: Follow along as your teacher reads the prayer. Then, **cut out** the card and **glue** it to the back of your construction paper.



Gr. 1–Gr. 3

Jesus Gives Himself to Us in the Eucharist



Lesson at a Glance

Suggested Grade Level: 1st–3rd Grades



Learning Goals

- At the Last Supper Jesus instituted the Eucharist by changing bread and wine into His Body and Blood.
- Jesus taught us that He is the Bread of Life and that we must eat His Body and drink His Blood in order to have eternal life.
- The Eucharist is spiritual food that nourishes our souls.



Lesson Plan Chart

DAY 1

Warm-Up: Teacher guided activity

- *You will need: the video of the hymn “Sacrament Most Holy,” found at [SophiaOnline.org/SacramentMostHoly](https://www.sophiaonline.org/SacramentMostHoly)*

Activity: Teacher guided activity

- *You will need: salt, yeast, flour, water, grapes, a loaf of bread, grape juice, small containers (cups or bowls) to display each of these items, and small paper cups (enough for each student)*

Formative Assessment: Handout A: Christ and the Eucharist Coloring Page

DAY 2

Warm-Up: Teacher guided activity

Activity: Handout B: Bread of the World and Handout C: Types of Bread

- *You will need: scissors and glue*

Formative Assessment: Handout D: Eucharist Decoding

DAY 3

Warm-Up: Handout E: Highest Summits

Activity: Handout F: Sources of Health

- *You will need: old magazines, scissors, and glue*

Formative Assessment: Handout G: First Communion Journey



Connections to the *Catechism* in This Lesson

CCC 1324, 1337, 1365, 1392, 1412–1413



Vocabulary Your Students Will Learn

- The **Eucharist** is the Sacrament in which we receive the Body and Blood, Soul and Divinity of our Lord Jesus Christ under the appearances of bread and wine. The Eucharist is the source and summit of our Christian life. It is spiritual food for the soul. It is not merely a symbol but is Jesus' true flesh and blood.
- The **Bread of Life** is a title for the Body and Blood of Jesus Christ given to us as spiritual food in the Eucharist.
- **First Communion** refers to the first time a Catholic receives Holy Communion, typically around the age of 7.



Key Scripture Passages

Then he took the bread, said the blessing, broke it, and gave it to them saying, "This is my body, which will be given for you; do this in memory of me." And likewise the cup after they had eaten, saying, "This cup is the new covenant in my blood, which will be shed for you."

— *Luke 22:19–20*

"I am the living bread that came down from heaven; whoever eats this bread will live forever; and the bread that I will give is my flesh for the life of the world."

— *John 6:51*



Prayer for This Lesson

O Sacrament most Holy,
O Sacrament Divine,
All praise and all thanksgiving,

Be every moment Thine.
Amen.

Day 1



Preparation before Class

Prior to class, collect the following materials: salt, yeast, flour, water, grapes, a loaf of bread, grape juice, and small containers (such as cups or bowls) to display each material.

Warm-Up

- A.** Begin by teaching your students the prayer for this lesson and pray it together.



O Sacrament most Holy,
O Sacrament Divine,
All praise and all thanksgiving,

Be every moment Thine.
Amen.

- B.** Next, explain that this prayer is recited, and often sung, in front of Jesus in the Eucharist. Ask your students if there are any words they are unfamiliar with and explain them. In this prayer, the word Sacrament refers to the **Eucharist**, the true presence of Christ.
- C.** Then, teach your students to sing this prayer, according to the melody of the traditional hymn. Refer to the video of the hymn found at the following link: **[SophiaOnline.org/SacramentMostHoly](https://www.sophiaonline.org/SacramentMostHoly)**. Sing it a few times together as a class.

Activity

- A.** Begin by placing the salt, yeast, flour, and water on a table in the front of the classroom where your students can see them. If possible, invite them to stand in a circle around the table.
- B.** Ask them what they see and what they think the ingredients are used to make. *Accept reasoned answers. These are the ingredients for making bread.* Then, place the bread on the table.
- C.** Next, place the grapes on the table. Ask your students what they see and what they can be used to make. *Grapes. They can be used for making grape juice and wine.* Then, place the grape juice on the table.
- D.** Explain to your students that the Eucharist is the Real Presence of the Body and Blood, Soul and Divinity of Jesus Christ under the appearance of bread and wine. The simple gifts of bread and wine, made from these simple ingredients, are changed by the Holy Spirit into Jesus' Body and Blood at every Mass.
- E.** Have your students taste a small piece of the bread and a small sip of the grape juice from individual cups.



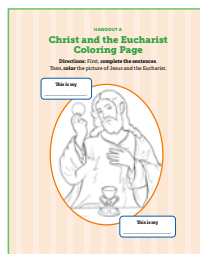
Teacher's Note

Be aware if any of your students have a gluten allergy, and observe appropriate precautions.

- F.** Explain that, while the examples of bread and grape juice we have before us on this table are not the Eucharist, humble bread and wine (similar to this grape juice) are offered by the priest at Mass in sacrifice, and, with the power of the Holy Spirit, are changed into Christ's Body and Blood while still looking, feeling, smelling, and tasting like bread and wine. Jesus gave His Apostles the power to change the bread and wine into the Eucharist. At the Last Supper, Jesus took bread and wine and Jesus said to His Apostles, "This is my body... this is my blood" (**Matthew 26:26, 28**). He did not say it was a symbol, but that they truly are His Body and Blood. Today, bishops and priests faithfully do as Jesus said, and continue the work of the Apostles throughout the world.

You may wish to share with the class that on very rare and special occasions, God has given the faithful a sign that the Eucharist is truly His Body and Blood in Eucharistic miracles. When a Eucharistic miracle happens, a consecrated host visibly becomes a piece of cardiac (heart) muscle tissue. You can share briefly about some of these events using information from the lesson on Eucharistic Miracles beginning on **pg. 89** of this guide.

DAY 1 > Formative Assessment



- A.** Distribute to your students **Handout A: Christ and the Eucharist Coloring Page**. Help them fill in the blanks with the words of Christ from the Last Supper: "This is my body," and "This is my blood."
- B.** Then, make crayons, markers, and/or colored pencils available, and have them color the picture.

"Christ and the Eucharist Coloring" Answer Key

Top left box: Body

Bottom right box: Blood

Day 2


Warm-Up

A. Begin by leading your students in the prayer for this lesson.



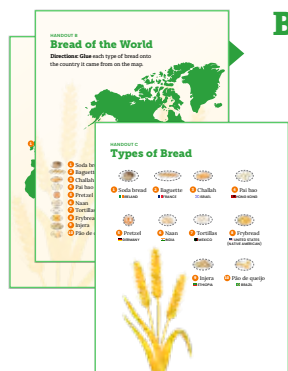
O Sacrament most Holy,
O Sacrament Divine,
All praise and all thanksgiving,


Be every moment Thine.
Amen.

- B.** Next, **project**  an image of a large family gathered for a holiday meal, such as Thanksgiving or Christmas. Choose an image with many joyful people seated at a table with food. Give your students a moment to observe the photograph, and then ask the following questions:
- What do you notice about the picture? What are the people doing? *Accept reasoned answers.*
 - What common elements are a part of family gatherings such as this one? *Good food, family/friends, joy, and love.*
 - Why do you think meals like this one are important? *Accept reasoned answers. They bring people together in one place to share something together.*
 - Why do you think Jesus chose a meal to give the greatest gift of the Eucharist to His Apostles? *Accept reasoned answers. Similarly, because people come together in one place to share the same meal together, He gave us the gift of Himself in the Eucharist in a tradition where we come together for a shared purpose.*
- C.** Point out the importance of Jesus intentionally choosing a meal to bring people together and to share the gift of the Eucharist with them.

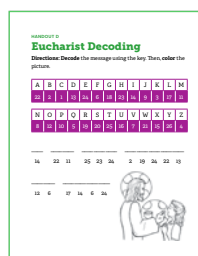
DAY 2 › Activity

- A.** Begin by asking your students the following questions:
- Why do you think Jesus chose bread to be the physical substance of the Eucharist? *Accept reasoned answers. Help students conclude that bread is a simple and ordinary food that is common in most cultures around the world. It is a staple in most diets and provides nutrition and substance.*
 - What kinds of things do you eat that include bread? *Accept reasoned answers. Examples may include sandwiches, hamburgers, hot dogs, even pizza or spaghetti (garlic bread).*
 - What different kinds of bread can you think of from around the world? *Accept reasoned answers, which may include French bread, Italian bread, naan, croissants, frybread, and even pretzels.*



- B.** Next, distribute to your students **Handout B: Bread of the World**. Ask them what they see depicted on the page. *A map of the world.*
- C.** Then, distribute **Handout C: Types of Bread** and make scissors and glue available. Have your students cut out each of the different pictures of bread. Then, using the map key, discuss each of the types of bread with your students, explaining to them which country each originates from and helping them locate the country on the map. Finally, help them to glue each image of bread onto corresponding countries on their maps.
- D.** Conclude the activity by **reading aloud**  **John 6:48–51** from your Bible and discussing it with your students. In this passage, Jesus tells His Apostles, “I am the bread of life.” While other bread is good for our bodies and sustains us, eventually we get hungry again. When Jesus said, “I am the **Bread of Life**” (**John 6:48**), He was telling us that the Eucharist, His own body, brings eternal life. It is our spiritual food that helps us grow in faith and leads us to Heaven.

DAY 2 > Formative Assessment



- A.** Distribute to your students **Handout D: Eucharist Decoding** and have them use the provided key to decode the message.
- B.** Then, make crayons, markers, and/or colored pencils available for your students to color the illustration.

“Eucharist Decoding” Answer Key

I AM THE BREAD OF LIFE

Day 3



Preparation before Class

Prior to class, collect a variety of old magazines from which your students can cut out images. Review each magazine thoroughly to be sure it does not contain any inappropriate images or content.

Warm-Up

- A.** Begin by leading your students in the prayer for this lesson.



O Sacrament most Holy,
O Sacrament Divine,
All praise and all thanksgiving,
Be every moment Thine.
Amen.

- B.** Next write the word *summit* on the board and ask your students if they know what it means. A *summit* is the highest point, commonly used to describe the peak of a mountain.
- C.** Then, ask if they know any of the world's tallest mountains. *Accept reasoned answers.*



- D.** Distribute to your students **Handout E: Highest Summits**. Look at the illustration together and **read aloud** 🗣️ the names of the mountains and their heights. (You may also wish to search the internet for display images of a few, or all, of these mountains and **project** 🖥️ them for your students to see.)


- E.** Next, explain to your students that just as the summit of a mountain is its highest point, we can also use the word *summit* to describe the highest point of our Faith. We do not mean a literal mountain top or geographical place, but rather its biggest and greatest part.

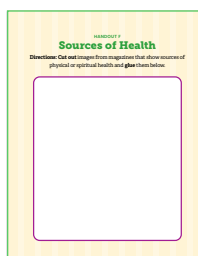
- F.** Then, ask your students what they think the highest point — the summit — is of the Christian life is. *Accept reasoned answers.*

- G.** Finally, **read aloud** 🗣️ *Catechism of the Catholic Church* no. 1324: “The Eucharist is the source and summit of the Christian Life.”

- H.** Explain that the Eucharist is the greatest of the Sacraments because it is the Body, Blood, Soul and Divinity of Jesus Christ. The Eucharist is God Himself present to us. Therefore, it is the highest summit of our Christian Faith. There is nothing bigger or greater than the gift of God Himself to us.

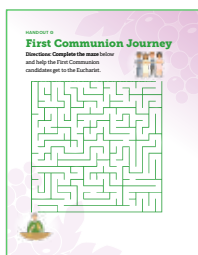
DAY 3 › Activity

- A. Begin by **reading aloud**  again the following passage from the *Catechism*. “The Eucharist is the source and summit of the Christian Life.” CCC 1324
- B. Next, ask your students what they think the word *source* means. *A source is where something comes from or originates.*
- C. On the board, write “Sources of Health” and ask your students to help you brainstorm all the sources of a healthy life. Write these ideas on the board. *Accept reasoned answers. Encourage students to think of sources of physical health (a sport or working out, healthy food), brain health (books, writing), and spiritual health (praying, reading the Bible).*



- D. Distribute to your students **Handout F: Sources of Health**. Make magazines, scissors, and glue available to them, and have them cut out any examples of sources of health they can find in the magazines and glue them in the space provided. These can include physical, brain, or spiritual health.
- E. When they have finished, call on student volunteers to share and explain some of the images they cut out.
- F. Then, explain that it is important to keep our bodies, minds, and spirits healthy using these sources of health. The Church describes the Eucharist as the “source” of the Christian life because it provides spiritual nourishment, or health, for our souls. All good things in the Christian life come from the Sacrament of the Eucharist. For this reason, Catholics in a state of grace are encouraged to receive the Eucharist frequently, at least once a week at Sunday Mass. Most Catholics receive their **First Communion** when they are around the age of 7, typically in the second grade. When we receive the Eucharist, we are united to Jesus Himself. We are made members of the one Body of Christ. All who receive the Eucharist participate in the one bread and one cup, which makes us one People of God, united to Christ and each other. Receiving your First Communion is something you should look forward to with joy and excitement.

DAY 3 › Formative Assessment



- A. Begin by explaining that next year, when your students are in the second grade, they will prepare for and receive the Eucharist at their First Communion. This is something they can look forward to and pray about starting now!
- B. Distribute to your students **Handout G: First Communion Journey** and have them complete the maze.

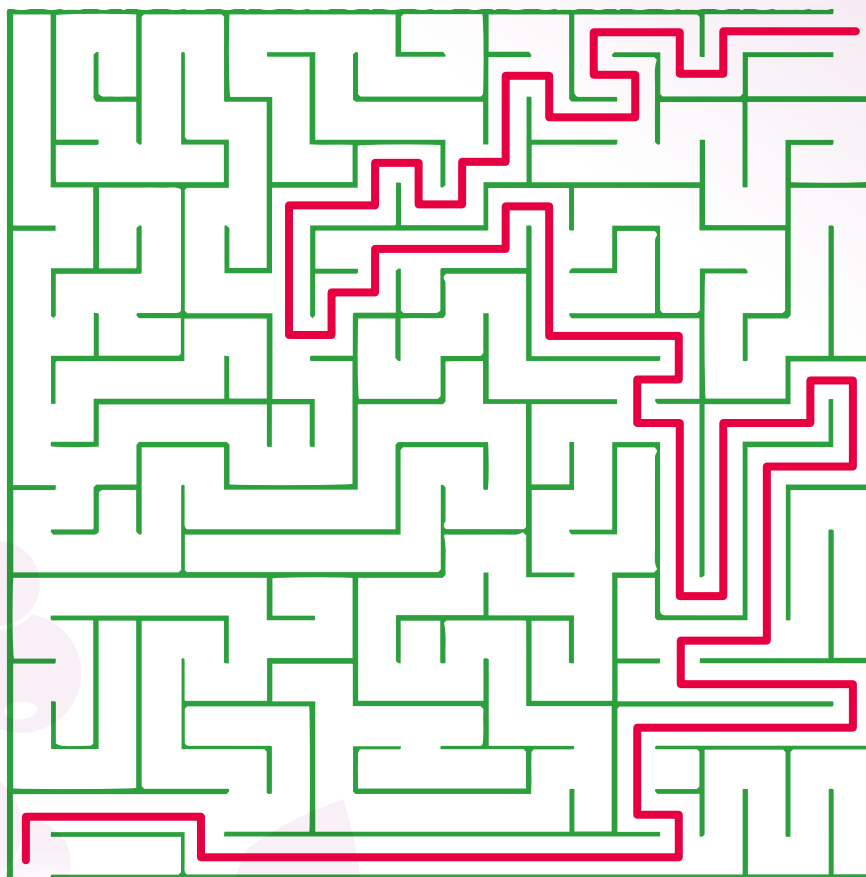
"First Communion Journey" Answer Key

Day 3

HANDOUT G

First Communion Journey

Directions: Complete the maze below and help the First Communion candidates get to the Eucharist.



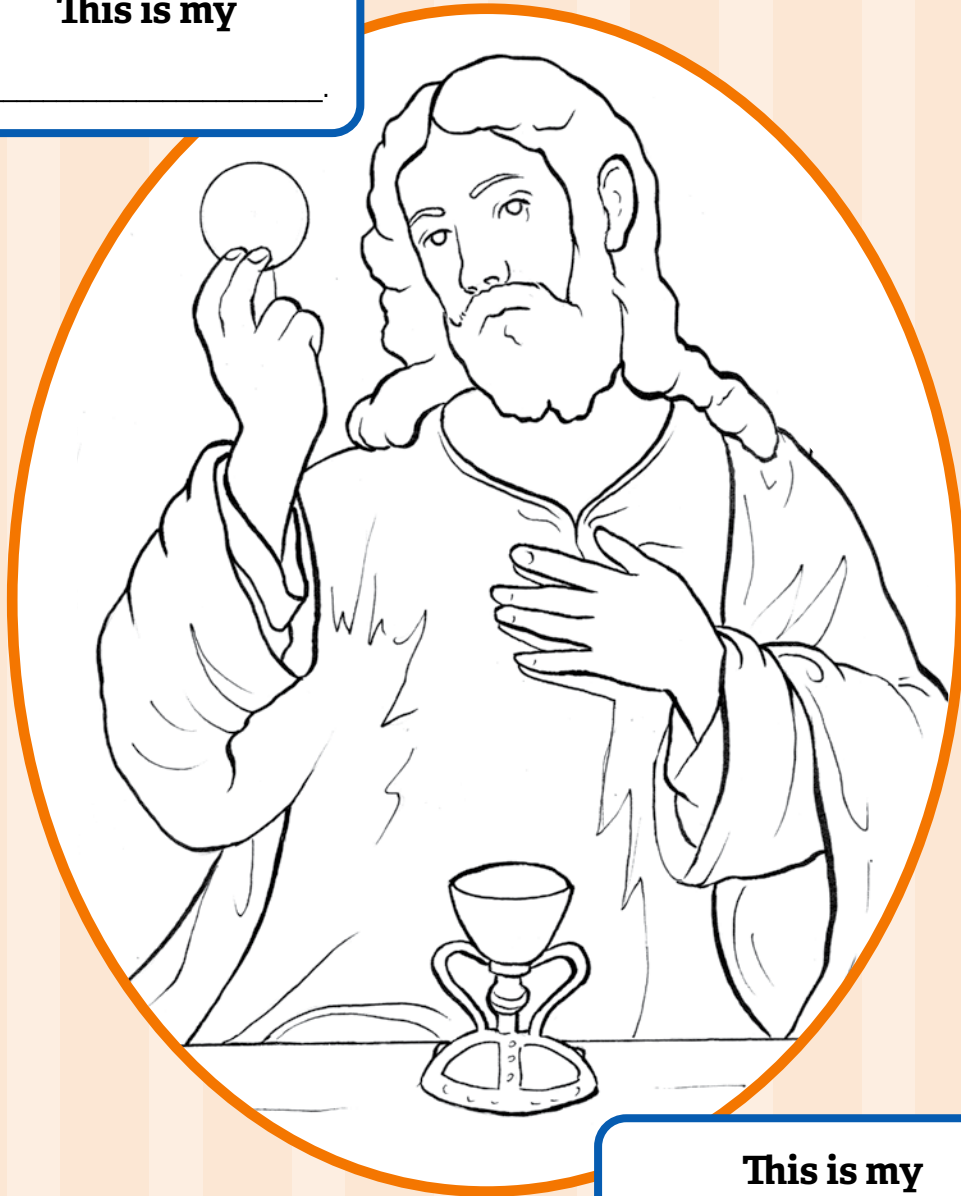
HANDOUT A

Christ and the Eucharist Coloring Page

Directions: First, **complete the sentences**.
Then, **color** the picture of Jesus and the Eucharist.

This is my

_____.



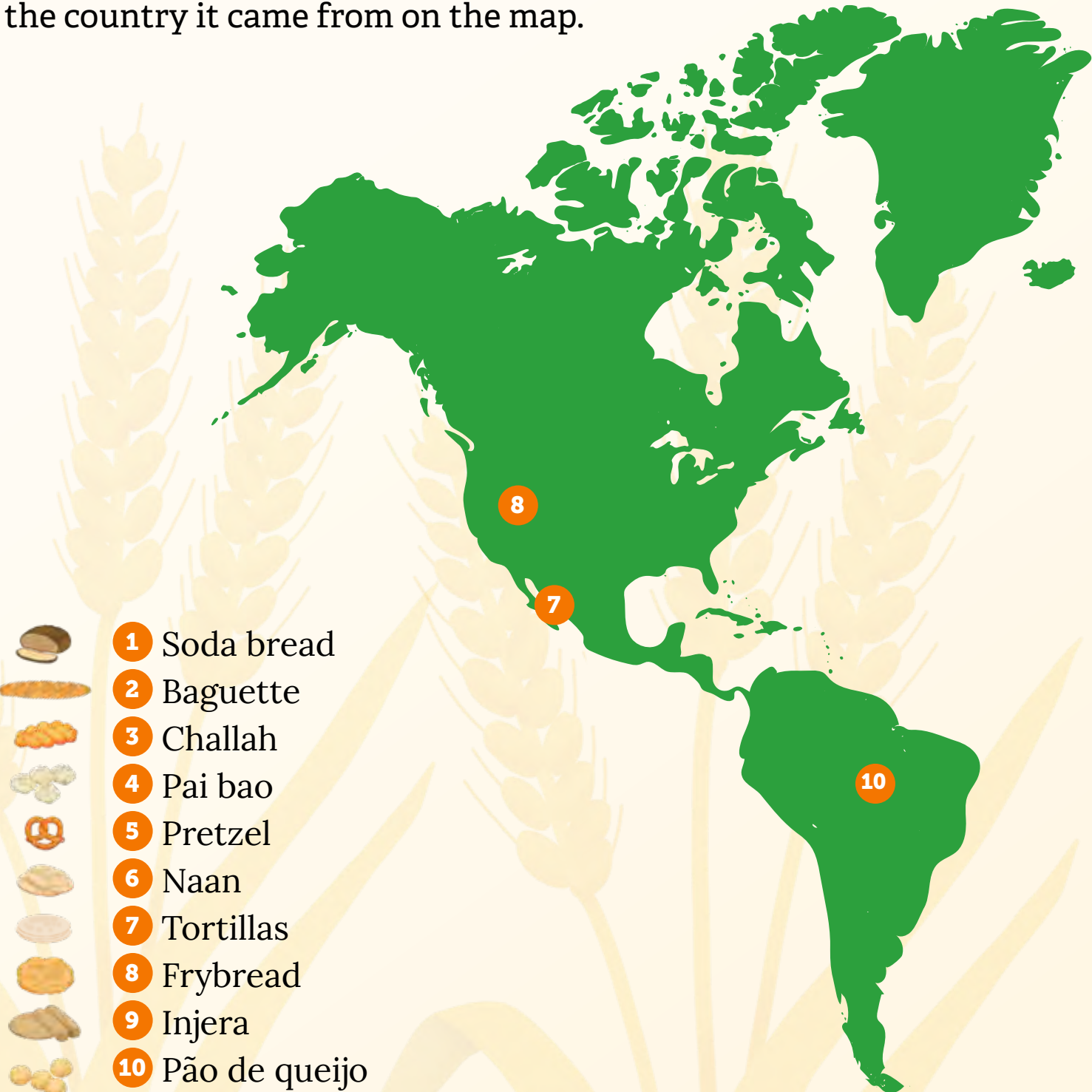
This is my

_____.

HANDOUT B

Bread of the World

Directions: Glue each type of bread onto the country it came from on the map.



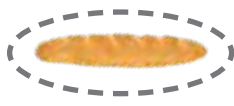
-  1 Soda bread
-  2 Baguette
-  3 Challah
-  4 Pai bao
-  5 Pretzel
-  6 Naan
-  7 Tortillas
-  8 Frybread
-  9 Injera
-  10 Pão de queijo



Types of Bread



1 Soda bread
🇮🇪 IRELAND



2 Baguette
🇫🇷 FRANCE



3 Challah
🇮🇱 ISRAEL



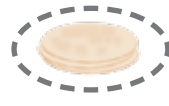
4 Pai bao
🇭🇰 HONG KONG



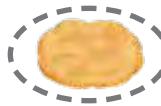
5 Pretzel
🇩🇪 GERMANY



6 Naan
🇮🇳 INDIA



7 Tortillas
🇲🇽 MEXICO



8 Frybread
🇺🇸 UNITED STATES
(NATIVE AMERICAN)



9 Injera
🇪🇹 ETHIOPIA



10 Pão de queijo
🇧🇷 BRAZIL



HANDOUT D

Eucharist Decoding

Directions: **Decode** the message using the key. Then, **color** the picture.

A	B	C	D	E	F	G	H	I	J	K	L	M
22	2	1	13	24	6	18	23	14	9	3	17	11

N	O	P	Q	R	S	T	U	V	W	X	Y	Z
8	12	10	5	19	20	25	16	7	21	15	26	4

 14 22 11 25 23 24 2 19 24 22 13

 12 6 17 14 6 24



HANDOUT E

Highest Summits

Mt. Everest, Himalayas



29,032 ft

Mt. Kilimanjaro, Tanzania



19,341 ft

Mt. Rushmore, South Dakota



5,725 ft

Average-height man

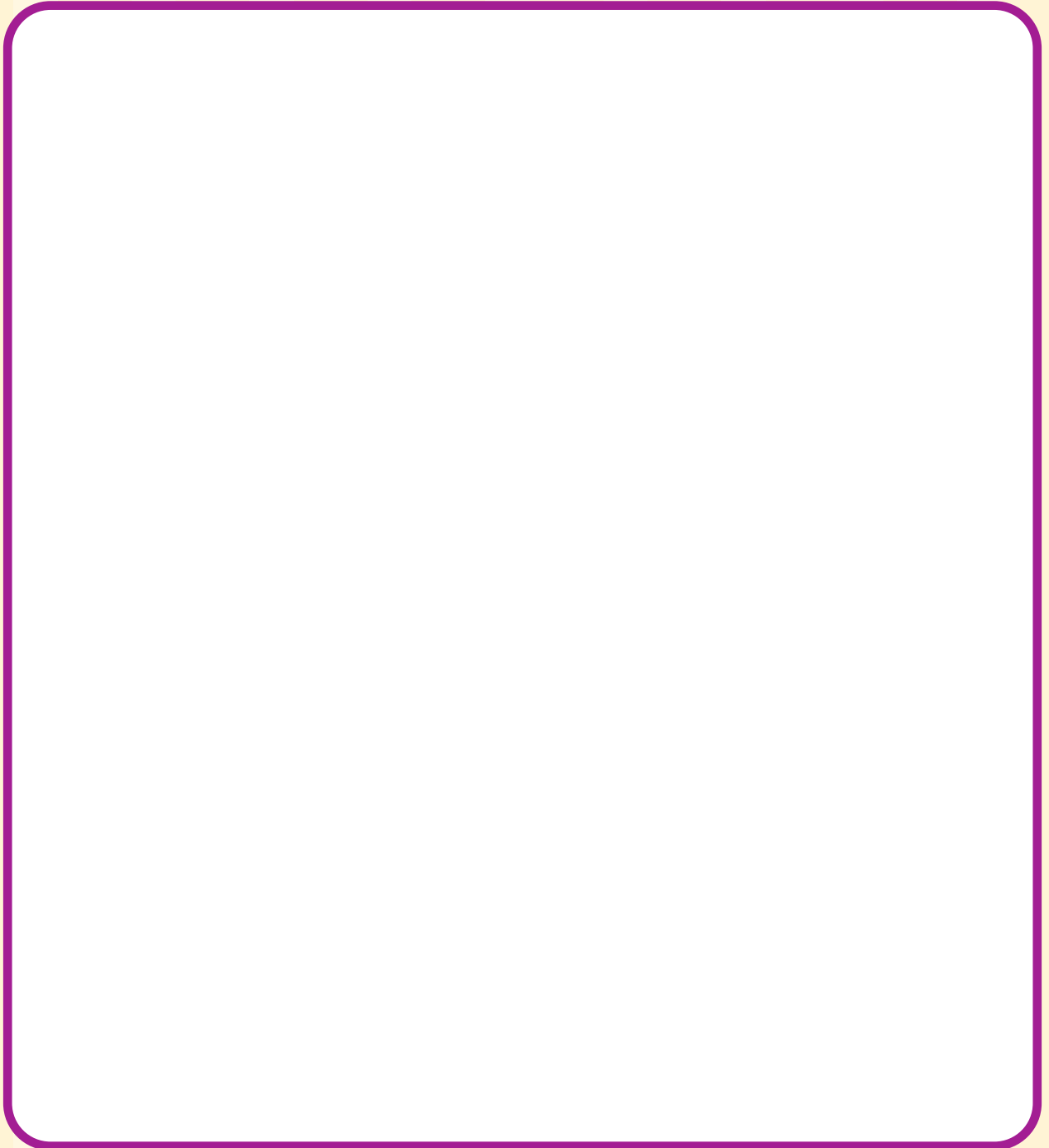


6 ft

HANDOUT F

Sources of Health

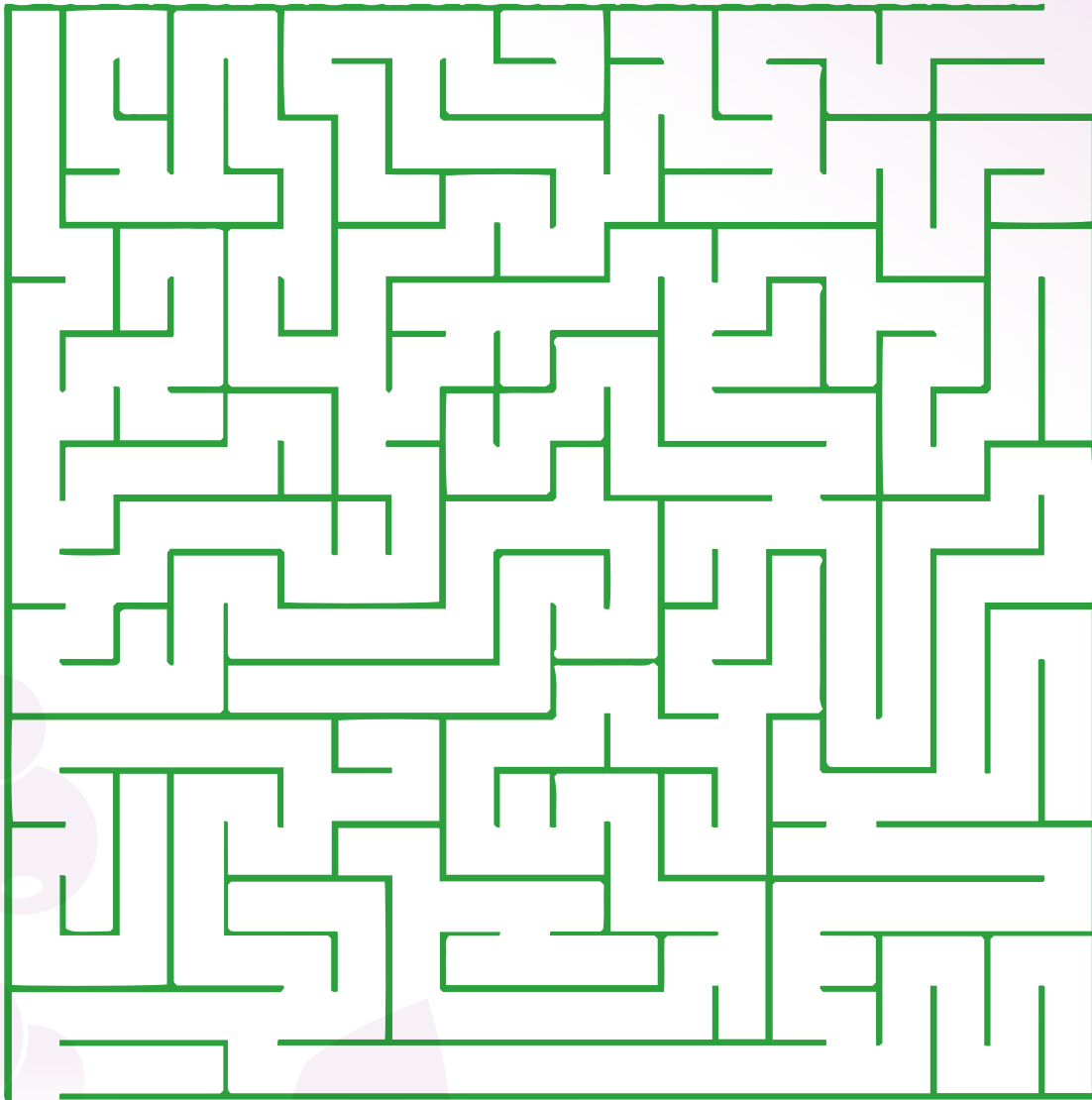
Directions: **Cut out** images from magazines that show sources of physical or spiritual health and **glue** them below.



HANDOUT G

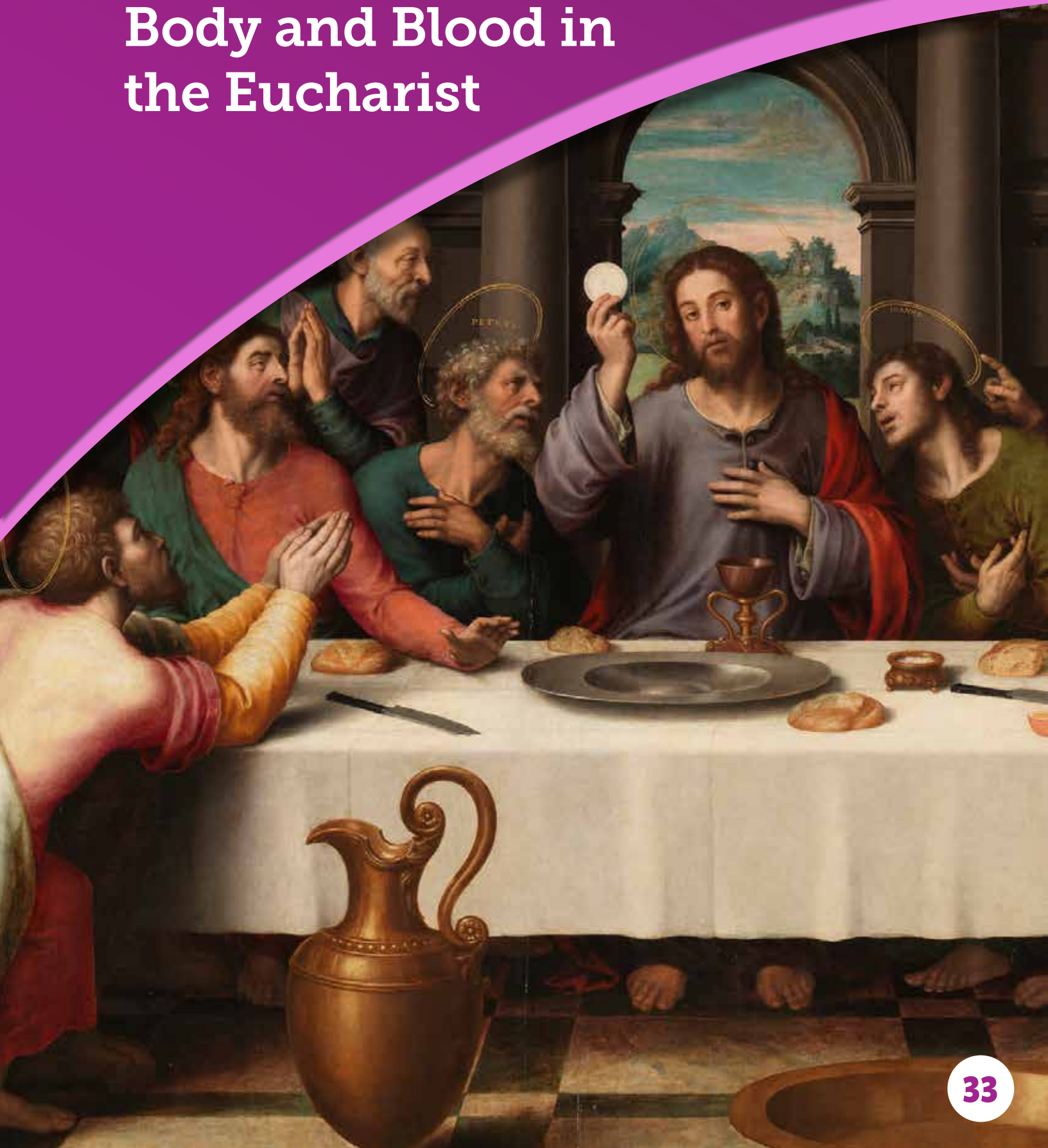
First Communion Journey

Directions: Complete the maze below and help the First Communion candidates get to the Eucharist.



Gr. 2–Gr. 4

Jesus Gives Us His Body and Blood in the Eucharist



Lesson at a Glance

Suggested Grade Level: 2nd–4th Grades



Learning Goals

- The miracle of the multiplication of the loaves and the fishes foreshadows the institution of the Eucharist at the Last Supper.
- Jesus taught us that He is the Bread of Life and that we must eat His Body and drink His Blood to have eternal life.
- Jesus instituted the Eucharist at the Last Supper as a memorial of His Death and Resurrection, and He commanded His Apostles to celebrate it until His return.
- Jesus transformed that Old Testament offering of bread into the sacrificial meal of the New Covenant.



Lesson Plan Chart

DAY 1

Warm-Up: Handout A: Feeding the Five Thousand

Activity: Handout B: What Did Jesus Do?

Formative Assessment: Handout C: Loaves and Fish

- *You will need: scissors, glue, and a paper plate for each student*

DAY 2

Warm-Up: Teacher guided activity

Activity: Handout D: What Is the Eucharist?

Formative Assessment: Handout E: The Living Bread

DAY 3

Warm-Up: Teacher guided activity

Activity: The Story of the Last Supper

- *You will need: a tablecloth (the color of the current liturgical season, if possible), two flameless candles, a special plate, a napkin, and a wine glass (Optional: a loaf of bread and grape juice or water that has been colored red.)*

Formative Assessment: Handout F: The Last Supper

- *You will need: scissors and (optional) cardstock for printing Handout F: The Last Supper*



Connections to the *Catechism* in This Lesson

CCC 547–548, 1335–1336, 1365, 1373–1376



Vocabulary Your Students Will Learn

- The **Bread of Life** is a title for the Body and Blood of Jesus Christ given to us as spiritual food in the Eucharist.
- The **Last Supper** is the final meal Jesus shared with His Apostles. There, Jesus changed bread and wine into His Body and Blood to eat in the Eucharist and commanded His Apostles to do the same in memory of Him.
- A **chalice** is a special cup to be used at a special feast.



Key Scripture Passages

“I am the living bread that came down from heaven; whoever eats this bread will live forever; and the bread that I will give is my flesh for the life of the world.”

— *John 6:51*

Then he took the bread, said the blessing, broke it, and gave it to them, saying, “This is my body, which will be given for you; do this in memory of me.” And likewise the cup after they had eaten, saying, “This cup is the new covenant in my blood, which will be shed for you.

— *Luke 22:19–20*



Prayer for This Lesson

Soul of Christ, **sanctify me.**
Body of Christ, **save me.**
Blood of Christ, **fill me.**
Water from the side of Christ, **wash me.**
Passion of Christ, **strengthen me.**
O good Jesus, **hear me.**
Within your wounds, **conceal me.**

All:
Do not permit me to be parted from you.
From the evil foe, protect me.
At the hour of my death, call me.
And bid me come to you,
to praise you with all your saints
forever and ever. Amen.

Day 1

Warm-Up

- A.** Begin by leading your students in the prayer for this lesson, the *Anima Christi*. For the first part of the prayer, have your students respond after you pray each line. Pray the second part together.





Soul of Christ, **sanctify me.**
 Body of Christ, **save me.**
 Blood of Christ, **fill me.**
 Water from the side of Christ, **wash me.**
 Passion of Christ, **strengthen me.**
 O good Jesus, **hear me.**
 Within your wounds, **conceal me.**

All:
 Do not permit me to be parted from you.
 From the evil foe, protect me.
 At the hour of my death, call me.
 And bid me come to you,
 to praise you with all your saints
 forever and ever. Amen.

- B.** Next, explain to your students that today they are going hear a very special and important story from the Gospel of John about a miracle Jesus performed. Ask your students to recall what a miracle is (*a supernatural act of God that demonstrates His power over all things*). Remind them that Jesus' miracles invited people to believe in Him and were signs of the Kingdom. One of Jesus' most well-known and important miracles is the multiplication of the loaves and the fishes. In this miracle, Jesus multiplied five loaves of bread and two fish to feed a crowd of 5,000 people and have some left over. Just as we learned about the importance of bread in the Old Testament, bread becomes even more important to our Faith in the New Testament. By this miracle, Jesus began to teach us about the bread He would give to us—the **Bread of Life**—that is, His own Body and Blood in the Eucharist. This miracle is so important that the story of it appears in all four Gospels! Today, we are going to read about this important miracle from the Gospel of Luke.

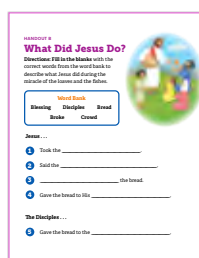


- C.** Then, distribute to your students **Handout A: Feeding the Five Thousand by Marten van Valckenborch**. **Project**  an image of the painting, which can be found at SophiaOnline.org/FeedingTheFiveThousand. Give your students a few moments to observe the painting.
- D.** Next, ask your students to take a deep breath, listen to the quiet, and observe the painting as you **read aloud**  **Luke 9:10–17** from your Bible.
- E.** Then, ask the following questions:
- What in this painting stands out to you the most? *Accept reasoned answers.*
 - Who is in the forefront of the picture? *Jesus, the Apostles, a young boy.*
 - Who is in the background of the picture? *The crowd of 5,000 people.*

- What is Jesus holding? What is He doing? *Jesus is holding the bread and He is blessing it or praying over it.*
- What is the people's reaction? What does their body language suggest to you? *They are in awe—amazed at the miracle.*
- Imagine you are present at this miracle. What would be your reaction? *Accept reasoned answers.*

DAY 1 > Activity

A. Explain to your students that, in the miracle of the multiplication of the loaves and the fishes, Jesus did very specific and intentional things to accomplish the miraculous multiplication of the loaves and fishes. He would later do these same things to accomplish another miracle at the Last Supper. We will look now at those things He did.



B. Next, distribute to your students **Handout B: What Did Jesus Do?**. Re-read **Luke 9:16** aloud to them:

Then taking the five loaves and the two fish, and looking up to heaven, he said the blessing over them, broke them, and gave them to the disciples to set before the crowd.

C. Then, help your students to fill in the blanks on the worksheet to contemplate the steps Jesus took to accomplish His miracle. When finished, review the correct answers.

D. Next, explain the following to your students in a mini-lecture:

The miracle of the multiplication of the loaves and the fishes is a sign of the Kingdom of God. It shows us that Jesus is concerned for His people. He cares about them and is attentive to their needs, even providing food for them when they are physically hungry. He provides for us in abundance, more than we could ever imagine. When we ask Jesus something in faith, He provides for us.

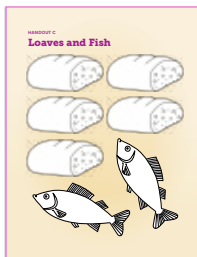
The miracle is also a preview of the special bread Jesus will give us to help us on our journey to Heaven: the Bread of Life, the Eucharist. As we have learned, the Eucharist is the Sacrament in which we receive the Body and Blood, Soul and Divinity of our Lord Jesus Christ, under the appearances of bread and wine. The Eucharist is the source and summit of our Christian life. It is spiritual food for the soul. It is not merely a symbol but is Jesus' true flesh and blood. Jesus told us that He is the Bread of Life. He said, "I am the bread of life; whoever comes to me will never hunger, and whoever believes in me will never thirst" (**John 6:35**). (We will learn more about Jesus' teaching that He is the Bread of Life on day two of this lesson.)

At the **Last Supper**, on the night before He died, Jesus performed another miracle: He took bread, said the blessing, broke the bread, and gave it to His disciples. Notice that the exact same words are used in the story of the Last Supper as are used in the story of the multiplication of the loaves and the fishes. Only this time, Jesus did not multiply the bread; He changed it into His Body and Blood, food not just for the body, but for our souls. (We will learn more about the Last Supper on day three of this lesson.)

“What Did Jesus Do?” Answer Key

1. Bread
2. Blessing
3. Broke
4. Disciples
5. Crowd

DAY 1 > Formative Assessment



- A. Distribute to your students **Handout C: Loaves and Fish**. Distribute to each student a paper plate and make crayons, markers, and/or colored pencils, scissors, and glue available. Have your students write on each loaf of bread one thing they are thankful for. Then, have them color and cut out the loaves and the fish and glue them onto their paper plates.
- B. When they have finished, review with your students the actions Jesus took during the miracle of the multiplication of the loaves and fishes. Then, ask your students the following questions:
 - How did Jesus care for the needs of the crowd with this miracle? *He provided for their physical hunger by giving them bread and fish.*
 - Why do you think it is important that the Gospel noted that there were 12 baskets of food left over? *Accept reasoned answers. Help your students recognize that, not only does Jesus provide for our immediate needs, He does so in abundance—He gives us more than we could ever want. The same is true with every blessing Jesus gives to us. He wants to pour out His grace upon us, not to just give us the bare minimum, but an abundance of His grace and love.*
- C. Conclude by leading your class in a brief prayer of thanksgiving for the blessings Jesus has given to them. Consider displaying your students' work around your classroom.

Day 2



Preparation before Class

If possible, invite your parish priest to participate in this lesson with the vessels.

Warm-Up

A. Begin by leading your students in the prayer for this lesson, the *Anima Christi*.



Soul of Christ, **sanctify me.**
 Body of Christ, **save me.**
 Blood of Christ, **fill me.**
 Water from the side of Christ, **wash me.**
 Passion of Christ, **strengthen me.**
 O good Jesus, **hear me.**
 Within your wounds, **conceal me.**

All:
 Do not permit me to be parted from you.
 From the evil foe, protect me.
 At the hour of my death, call me.
 And bid me come to you,
 to praise you with all your saints
 forever and ever. Amen.

B. Next, explain to your students that, after the miracle of the multiplication of the loaves and fishes, Jesus continued to teach His disciples about the Eucharist — His own Body and Blood — that He would soon give them. In the Gospel of John, Jesus taught us about another important kind of bread — the Bread of Life — that feeds not only our bodies, but our souls as well.

C. Then, make a prayerful atmosphere in your classroom and ask your students to listen carefully to the Gospel reading you will be reading to them. Invite them to close their eyes and to imagine that they are present in the crowd as Jesus teaches them. **Read aloud** 🗣️ to your students **John 6:48–58** from your Bible.

D. When finished, ask them the following questions:

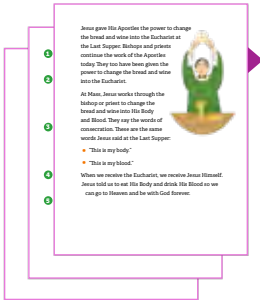
- What did Jesus tell the crowd that He was? *The Bread of Life, the living bread that came down from Heaven.*
- What did Jesus say about the people's ancestors? *They ate manna in the desert but still died. (We learned about manna in Lesson 34.)*
- What will happen to the ones who eat the bread that comes from Heaven? *They will eat and not die — they will live forever.*
- What is the living bread that came down from Heaven, the bread of life? *The flesh (the Body) of Jesus.*
- What does Jesus say about His flesh and blood? *It is true food and true drink.*

- What will the person who eats Jesus' flesh and drinks His Blood have? (*Eternal*) life.
- Overall, what do we understand Jesus to be teaching about in this passage? (Hint: Many people receive it every time they attend Mass.) *The Eucharist, Jesus' Body and Blood, Soul and Divinity.*

E. Conclude by explaining to your students that this passage from the Gospel of John is very important to our Catholic Faith. Here, Jesus began to teach His disciples about the meaning of the Eucharist that He would give us. Just as bread is an essential food for physical life, the Eucharist is spiritual food for the soul. Jesus told us plainly and clearly that He would give us His Body to eat and His Blood to drink. The Eucharist—the Bread of Life—is not merely a symbol but is Jesus' true flesh and blood. His Body and Blood are food that nourishes our souls and leads us to eternal life.

DAY 2 > Activity

A. Explain to your students that the Eucharist is the true Body and Blood, Soul and Divinity of Jesus Christ. Jesus very clearly taught us that, just as bread is an important food that provides nourishment for our bodies, His Body and Blood are true food that nourishes our souls. And He gives us His Body and Blood in the Eucharist under the appearances of bread and wine.



- B.** Distribute to your students **Handout D: What Is the Eucharist?** and have them read about the Eucharist (or **read aloud** 🗣️ to them as they follow along). Then, have them answer the questions.
- C.** Conclude by reviewing and discussing the correct answers.

“What Is the Eucharist?” Answer Key

1. Body, Blood
2. b
3. a
4. Apostles
5. b

DAY 2 > Formative Assessment

- A.** Distribute to your students **Handout E: The Living Bread**. First, have them complete the sentences:
- This is my _____. (*Body*)
 - This is my _____. (*Blood*)
- B.** Then, make crayons, markers, and/or colored pencils available, and have your students color the image of Jesus and the Eucharist.
- C.** As students color, you may wish to share with students that on very rare and special occasions, God has given the faithful a sign that the Eucharist is truly His Body and Blood in Eucharistic miracles. When a Eucharistic miracle happens, a consecrated host visibly becomes a piece of cardiac (heart) muscle tissue. You can share briefly about some of these events using information from the lesson on **Eucharistic Miracles** beginning on **pg. 89** of this guide.

Day 3



Preparation before Class

Before class begins, place a table at the front of your classroom. Set it with a tablecloth (the color of the current liturgical season, if possible), two flameless candles, a special plate, a napkin, and a wine glass. (If possible, invite your parish priest to participate in this lesson with the sacred vessels.) To enhance the lesson, consider bringing in a loaf of bread and grape juice or water that has been colored red.

Warm-Up

- A.** Begin by leading your students in the prayer for this lesson, the *Anima Christi*.




Soul of Christ, **sanctify me.**
 Body of Christ, **save me.**
 Blood of Christ, **fill me.**
 Water from the side of Christ, **wash me.**
 Passion of Christ, **strengthen me.**
 O good Jesus, **hear me.**
 Within your wounds, **conceal me.**

All:
 Do not permit me to be parted from you.
 From the evil foe, protect me.
 At the hour of my death, call me.
 And bid me come to you,
 to praise you with all your saints
 forever and ever. Amen.

- B.** Next, ask your students to turn to a neighbor and share with each other what they would have for a special birthday meal if they could have anything they wanted. After a few moments, call on a few pairs of students to share their responses with the class.
- C.** Then, guide the conversation to a discussion of special meals, such as birthday dinners, Thanksgiving, or Christmas. Ask your students to brainstorm with you all the elements they can think of that make a meal special. In other words, what makes Thanksgiving or Christmas dinner different from any other dinner? *Accept reasoned answers, which may include the people present at the meal, where people sit around the table, the use of the dining room table rather than the kitchen table, going out to a special favorite restaurant, the use of good china and silverware, special favorite foods and drinks served, days of preparation for the meal, candles at the table, the use of a nice tablecloth or placemats, and so forth.*
- D.** Conclude the discussion by asking them why they think we do all these things for a special meal? *Accept reasoned answers. We may do these things for a special meal to honor the person or event the meal is inspired by, to show the importance of the meal or the people gathered, to enhance the beauty and significance of the occasion, and so forth.*

DAY 3 > Activity

- A.** Begin by inviting your students to gather around the table in the front of your room. Then, set the table with them, using the items you have brought from home (or borrowed from the parish) so they can see the different elements that would have been present at the Last Supper and that are also present at the Mass. Choose a few students to help you, giving each of them an item to hold until it is time to place it on the table.
- B.** Explain that we are setting this table before us to remind us of the Last Supper, which we will hear about in the Gospel story we will soon read together.
- C.** Next, show and explain each item, and then hand it to a student.
- Begin with the tablecloth. Explain that we cover the table to prepare a proper place for the meal to be served. Ask two or three students to help place the tablecloth on the table.
 - Next, give the two flameless candles to different children, and have them turn them on. Explain that candles add a sense of importance and joy to the table, and, in this case, they remind us of Jesus, who is the Light of the World, of His presence, and of our prayer. Ask the students, one at a time, to place the candles on each end of the table.
 - Then, give a student the wine glass (or chalice), and explain that a **chalice** is a special cup to be used at a special feast. At the Last Supper, the chalice would be the special cup in which Jesus changed the wine into His very Blood. Have the student place it on the table.
 - Then, give a student the plate (or paten), and explain that a plate like this holds our food. At the Last Supper (and at every Mass), it would hold the precious Body of our Lord, Jesus Christ. Have the child place it on the table.
 - If possible, place a small piece of bread on the plate, and fill the **chalice** with grape juice or water dyed red to enhance the lesson.
- D.** Then, explain to your students that you would like them to listen to the Gospel story of the most important meal of all time: the Last Supper. This meal was greater than any other, for during it, Jesus performed the greatest miracle of all: He gave us the Holy Eucharist, His very Body, Blood, Soul, and Divinity. Ask the children to close their eyes, take a deep breath, and listen to the silence. Pray with them that God would prepare their hearts to hear the Gospel. Then, **read aloud**  **Luke 22:14–20** from your Bible.
- E.** When finished, ask your students the following questions:
- On what feast did the Last Supper take place? *The Passover.*
 - What did Jesus do with the bread? *He took the bread, said the blessing, broke it, and gave it to His disciples.*
 - When Jesus took bread, what were the words He said? *“This is my body, which will be given for you; do this in memory of me.”*
 - When Jesus took the cup, what were the words that He said? *“This cup is the new covenant in my blood, which will be shed for you.”*

- What did Jesus command His Apostles to do? *“Do this in memory of me.” Explain to your students that, here, Jesus commanded His Apostles to celebrate this sacred meal until the end of time.*
- How is the story of the Last Supper similar to the miracle of the multiplication of the loaves and the fishes that we learned about in the last lesson? *The miracle of the multiplication of the loaves and fishes prefigured the Eucharist. Both stories contain miracles. In both stories Jesus takes the bread, says the blessing, breaks the bread, and gives it to His disciples, and they eat. Jesus gives bread to supply for the needs of His people. In the miracle of the loaves and the fishes, Jesus gave them bread for their physical hunger. At the Last Supper, Jesus gives us the Eucharist, which is spiritual food for our body and soul. Accept other reasoned answers.*

DAY 3 > Formative Assessment



A. Distribute to your students **Handout F: The Last Supper** and make crayons, markers, and/or colored pencils, and scissors available. Have them color and cut out the chalice, plate, and bread. (You may consider using cardstock to print the cutout page and distributing it to your students instead of having them cut out the paper versions.)

B. Explain that these items would have been found at the Last Supper and are still used at every Mass today.

C. Then, ask your students to do the following:

- Hold up the cutout that represents what Jesus changed into His Body at the Last Supper. *The bread.*
- Hold up the cutout that represents the container that held the wine that Jesus changed into His Precious Blood at the Last Supper. What is this container called? *The chalice.*
- Hold up the container that represents what held Jesus' Body at the Last Supper. What is this container called? *The paten.*
- Hold up the cutout that represents what the priest uses to change the wine into Jesus' Precious Blood at Mass. *The chalice.*
- Hold up the cutout that represents what the priest uses at Mass to hold Jesus' Body. *The paten.*
- Hold up the cutout that represents what the priest changes into Jesus' Body at Mass. *The bread.*

D. Finally, conclude by discussing with your students how their previous loaves-and-fishes craft compares with this one. What elements are similar? *Both involve bread, much like the stories we have learned about in the Old Testament involved bread. Jesus transformed the meaning and importance of bread to the faith into part of the sacrificial meal of the New Covenant.*

HANDOUT A

Feeding the Five Thousand

by
Marten van
Valckenborch



HANDOUT B

What Did Jesus Do?

Directions: Fill in the blanks with the correct words from the word bank to describe what Jesus did during the miracle of the loaves and the fishes.

Word Bank**Blessing****Disciples****Bread****Broke****Crowd****Jesus . . .**

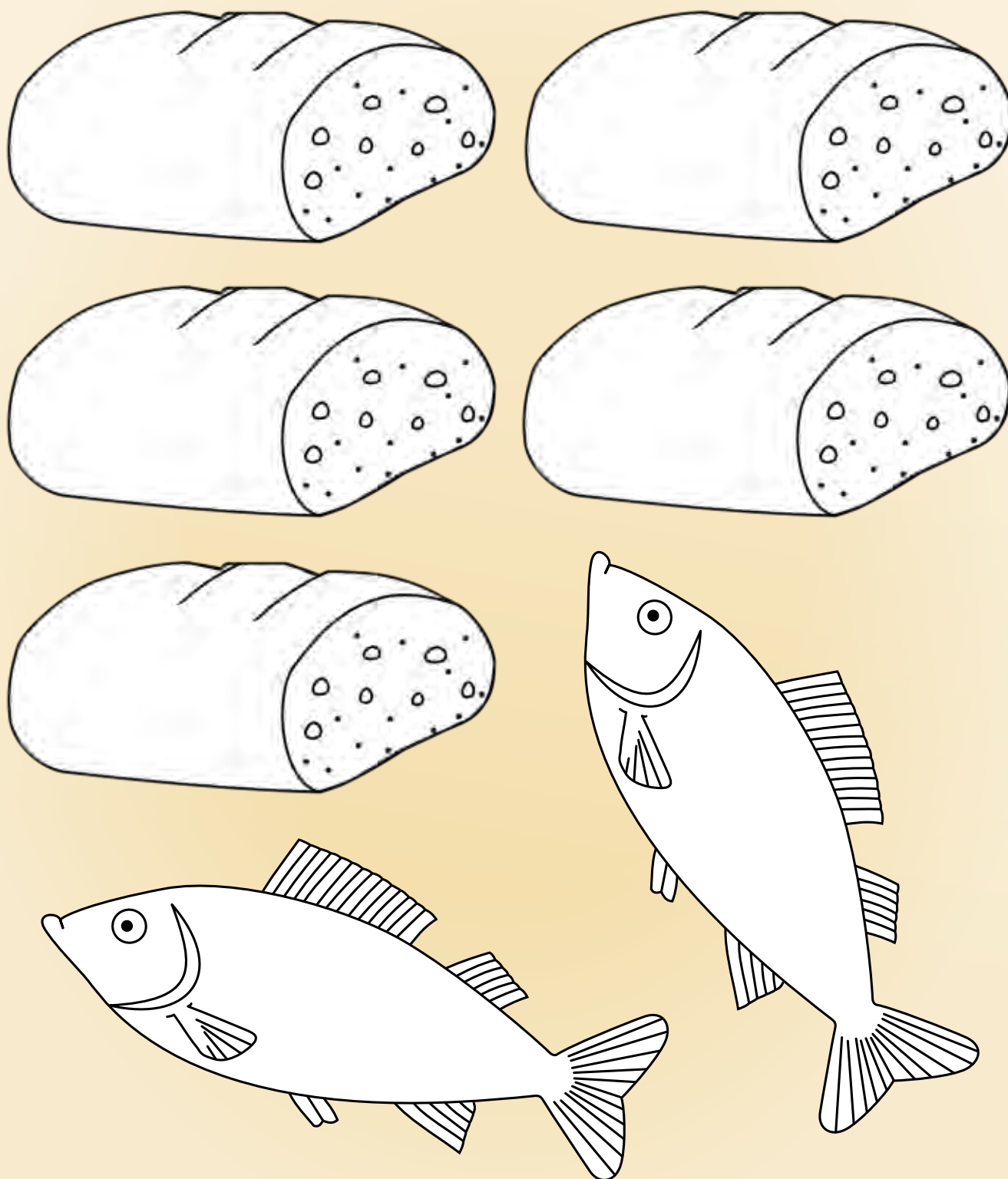
- 1** Took the _____.
- 2** Said the _____.
- 3** _____ the bread.
- 4** Gave the bread to His _____.

The Disciples . . .

- 5** Gave the bread to the _____.

HANDOUT C

Loaves and Fish



HANDOUT D

What Is the Eucharist?

Directions: Read about the Eucharist. Then, **answer the questions.**

We receive the Eucharist at Mass.

The Eucharist is the real Body and Blood of Jesus Christ. Gifts of bread and wine are changed into Jesus' Body and Blood at every Mass.

The Eucharist still looks, feels, tastes, and smells like bread and wine. Even so, it is no longer bread and wine. It has become the real Body and Blood of Jesus.

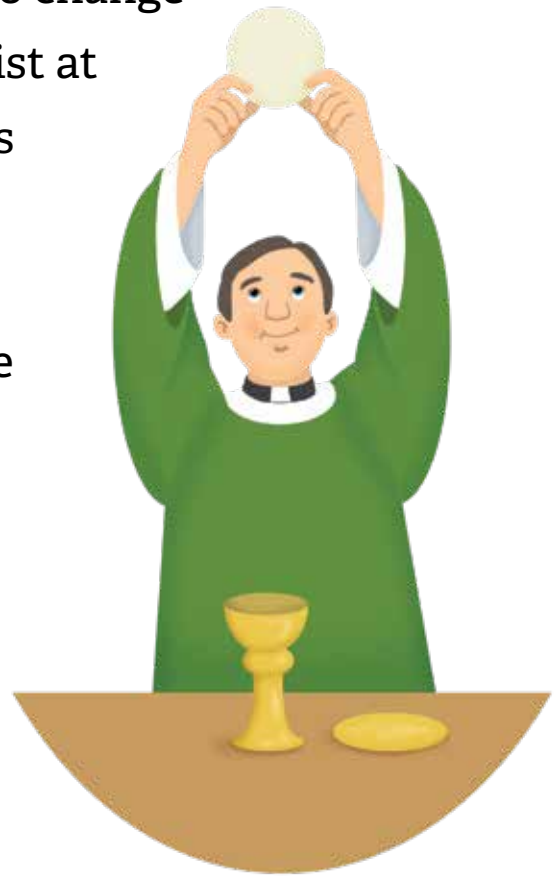


Jesus gave His Apostles the power to change the bread and wine into the Eucharist at the Last Supper. Bishops and priests continue the work of the Apostles today. They too have been given the power to change the bread and wine into the Eucharist.

At Mass, Jesus works through the bishop or priest to change the bread and wine into His Body and Blood. They say the words of consecration. These are the same words Jesus said at the Last Supper:

- “This is my body.”
- “This is my blood.”

When we receive the Eucharist, we receive Jesus Himself. Jesus told us to eat His Body and drink His Blood so we can go to Heaven and be with God forever.



1 The Eucharist is the real _____ and _____ of Jesus.

2 What is changed into Jesus' Body at Mass?

- a** Wine
- b** Bread
- c** An apple

3 What is changed at Mass into Jesus' Blood?

- a** Wine
- b** Bread
- c** An apple

4 Jesus gave the _____ the power to change bread and wine into the Eucharist.

5 Jesus told us to receive the Eucharist so we can... .

- a** Grow up strong.
- b** Go to Heaven.
- c** Never be sad.

HANDOUT E

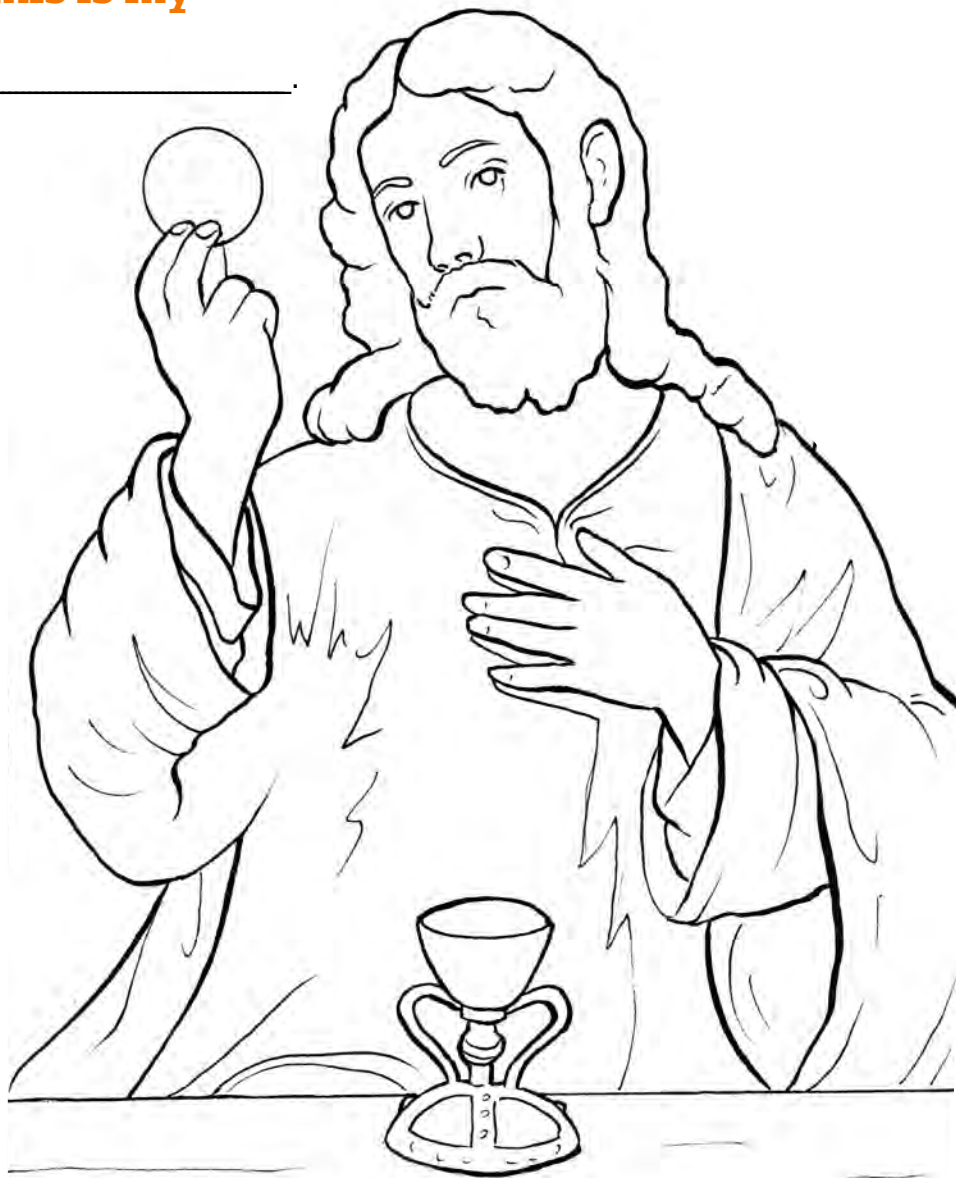
The Living Bread

First, **complete the sentences**.

Then, **color** the picture of Jesus and the Eucharist.

This is my

_____.

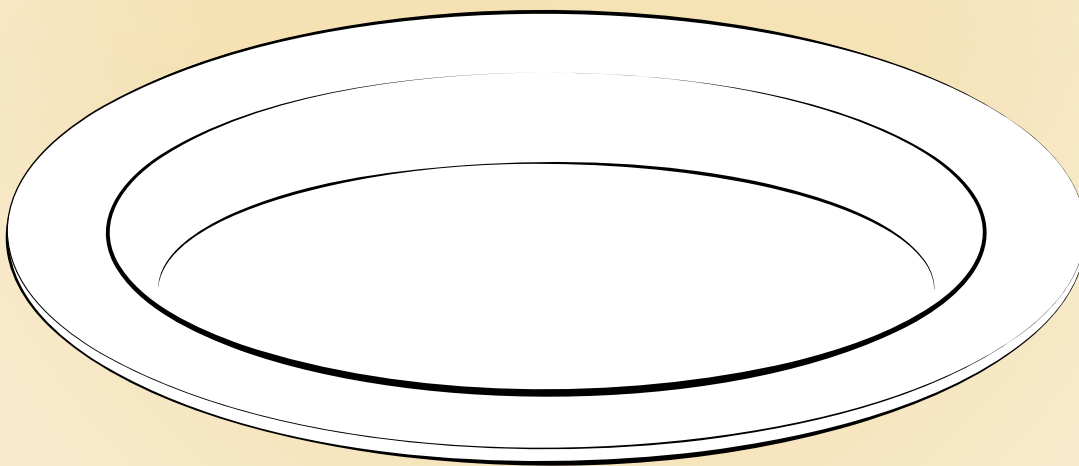
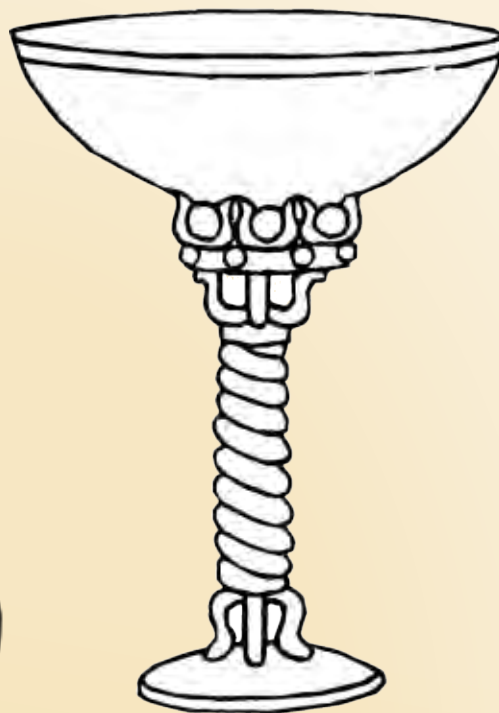


This is my

_____.

HANDOUT F

The Last Supper



Transubstantiation

SUGGESTED GRADE LEVELS: 4TH-5TH GRADE

Learning Goals

- All that needs to be explained about something can be done by answering four questions: What is it? What is it made of? Who or what made it or caused it to happen? What is it for?
- Transubstantiation is the teaching that the bread and wine at Mass cease to be in substance bread and wine and transform into the true Body and Blood of Jesus Christ, while retaining the accidental forms of bread and wine.
- It takes faith to truly recognize Jesus.



Connection to the *Catechism of the Catholic Church*

- CCC 1373–1376



Vocabulary

- Substance
- Matter
- Agent
- Purpose
- Transubstantiation
- Substantial Form
- Accidental Form

BIBLICAL TOUCHSTONES

“I am the living bread that came down from heaven; whoever eats this bread will live forever; and the bread that I will give is my flesh for the life of the world.” The Jews quarreled among themselves, saying, “How can this man give us [his] flesh to eat?”

JOHN 6:51-52

Thomas answered and said to him, “My Lord and my God!” Jesus said to him, “Have you come to believe because you have seen me? Blessed are those who have not seen and have believed.”

JOHN 20:28-29

Lesson Plan

Materials

- › Handout A: What Is It?
- › Handout B: Transubstantiation
- › Handout C: How Is This Possible?

DAY ONE

Warm-Up

Project or draw a simple picture of a peanut butter and jelly sandwich on the board. Ask your students the following questions:

- › What is this? *A peanut butter and jelly sandwich.*
- › What is a peanut butter and jelly sandwich made of? *Two pieces of bread, peanut butter, and jelly. You may push the conversation further and ask what the bread is made out of, such as wheat or grain and yeast, what the peanut butter is made out of, such as peanuts, and what the jelly is made out of, such as grapes or strawberries.*
- › Who or what made the sandwich? *A hungry person, or a mom or dad, or a chef.*
- › What is the sandwich for? *To eat, to provide nutrition, to satisfy hunger.*

Activity

- Explain to your students that St. Thomas Aquinas, (a brilliant theologian who lived in the 11th century and believed that what we know by faith and what we know by the power of human reason are actually compatible and complimentary to each other) and many ancient Greek philosophers such as Aristotle, believed that you could fully explain something by answering four basic questions about that thing.
- Write the following four questions on the board:
 - › What is it?
 - › What is it made of?
 - › Who or what made it or caused it to happen?
 - › What is it for?
- Explain to your students and write on the board next to each question the following vocabulary words:
 - › **Substance** — What a thing is. A thing's substance describes what a thing is, or what is absolutely necessary to a thing being the thing that it is.
 - › **Matter** — What a thing is made out of.
 - › **Agent** — Who or what made or caused a thing to exist.
 - › **Purpose** — What a thing is for or meant to do.

- D. Explain that these four questions are known as the “four causes” and that if you can answer each question successfully and satisfactorily then you have fully explained the thing you’re trying to explain.
- E. Arrange students into pairs and trios and distribute **Handout A: What Is It?** to each group. Have them discuss and determine the “four causes” of each item on the worksheet. Circulate the room and assist groups as needed.

HANDOUT A
What Is It?

Object	What is it?	What is it made of?	Who/what made it?	What is its purpose?
A wooden chair				
A watch				
A novel				
A pepperoni pizza				
The Statue of Liberty				
Think of your own item:				

Formative Assessment

- A. Review and discuss the answers to each question for each item on Handout A: What Is It? Ask for a few volunteers to share the item and explanation of the “four causes” that they thought of on their own.
- B. Point out to your students that this sort of thought experiment, while not scientific *per se*, shares characteristics with the scientific method, particularly how it uses observation as a basis for drawing conclusions about reality. Both methods – the inquiry St. Thomas uses with the four causes and the scientific method – seek to understand the world around us as it is.

DAY TWO

Warm-Up

Review the previous day’s lesson. Ask for volunteers to explain each of the “four causes” of a lasagna, a marble statue, and a car. Accept reasoned answers for each.

Activity


Distribute to your students **Handout B: Transubstantiation** and have them read the essay and complete the focus questions.

HANDOUT B
Transubstantiation

Directions: Read the essay and complete the focus and reflection questions.

At Mass, when the priest says the words of consecration, “This is my body which will be given up for you... this is the cup of my blood...” the bread and wine literally become the Body and Blood of our Lord, Jesus Christ. This is a difficult teaching to understand. The Eucharist still looks like bread and wine and when we receive it, it still tastes like bread and wine. But it is truly no longer bread and wine. It has become Jesus’ Body and Blood, Soul and Divinity. How does this happen?

We can think about what is necessary for something to be what it is and not something else. For example, what makes a chair a chair rather than a table? A chair has certain necessary characteristics that make it a chair. It does not possess the characteristics to be a table. These necessary characteristics are called “substantial forms.” The substantial form of a chair is its “chair-ness.” In other words, the substantial form of a chair is what is necessary for a chair to be a chair and not a table, or a banana, or something else entirely. Normally, you cannot change the substantial form of something without changing that thing into something else completely. If you take it apart and use the wood and nails to make something else. Then it would become a table, or a stool, or something else entirely.



Holy Mass: Heaven, Earth, Purgatory

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- HANDOUT C

Directions: First, read John 6:51-52, then write a 5-7 sentence paragraph that responds to the writing prompt below.

"I am the living bread that came down from Heaven; whoever eats this bread will live forever; and the bread that I will give is My Flesh for the life of the world." The Jews quarreled among themselves, saying, "How can this man give us [His] flesh to eat?"

Imagine that you have traveled back in time and are standing in the crowd when the quarreling Jews asked: "How can this man give us His flesh to eat?" How would you answer their question?

[illegible]

Warm-Up

- Distribute to your students **Handout C: How Is This Possible?** Have them complete the activity on the worksheet individually.

What Is It?

Object	What is it?	What is it made of?	Who/what made it?	What is its purpose?
A wooden chair				
A watch				
A novel				
A pepperoni pizza				
The Statue of Liberty				
Think of your own item: _____				

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Answer Key

1. A wooden chair/some kind of wood/a carpenter, or a chair maker, or a factory/to sit on, for rest, for decoration, to make money (in the case of the carpenter who made it and sold it)
2. A watch/the various parts of a watch/a watch maker/to tell time, for fashion
3. A novel/words, ideas, paper, ink/an author, a publisher, a printer/to read, to educate, to communicate ideas
4. A pepperoni pizza/cheese, sauce, pepperoni, pizza dough/a chef, or a pizza maker/to eat
5. The Statue of Liberty/copper, gold/Frederic Auguste Bartholdi, the French government/to be a symbol of freedom, to enhance the relationship between the US and France
6. Accept reasoned answers.

Transubstantiation

Directions: Read the essay and complete the focus and reflection questions.

At Mass, when the priest says the words of consecration, “This is my body which will be given up for you... this is the cup of my blood...,” the bread and wine literally become the Body and Blood of our Lord, Jesus Christ. This is a difficult teaching to understand. The Eucharist still looks like bread and wine and when we receive it, it still tastes like bread and wine. But it is truly no longer bread and wine. It has become Jesus’ Body and Blood, Soul and Divinity. How does this happen?

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something without changing that thing into something else completely. If you change the substantial form of a chair, it would no longer be a chair. You could take it apart and use the wood and nails to make something else. Then it would become a table, or a stool, or something else entirely.

We can also think about characteristics of something that do NOT make it what it is. For example, what a chair is made of does not make it a chair. A chair can be made of wood, or metal, or plastic, or many other types of material. A chair is also not a chair because of its color. A chair could be colored red, or blue, or green. What a chair is made of or what color it is doesn't make a chair what it is. These sorts of characteristics are called "accidents." The word "accident" simply means that even though the characteristic is a part of something, it does not make that something what it is. Color, for example, only makes a chair red, or blue, or green. It does not make a chair a chair, or something else instead. You can even change the accidents of a thing, and it will still be that thing. You can paint a red chair blue, or replace a wooden chair's legs with plastic, and it still remains a chair.

What does any of this have to do with the Eucharist? On one hand, it is enough just to know that by the power of the Holy Spirit, Jesus' Body and Blood, Soul and Divinity become truly present under the appearances of bread and wine. On the other hand, we can describe what happens at Mass during the consecration using the ideas we just learned: substantial forms and accidents.

At Mass, the change of bread and wine into the Real Presence of Jesus is called "transubstantiation." If you look closely at the word transubstantiation, it is made of two parts: the prefix trans, which means change, and the root word substance. In other words, transubstantiation is a "change of substance."

In the Eucharist, the substantial forms of the bread and wine are transformed into the substantial form of Christ's Body and Blood, Soul and Divinity. That means, the essential characteristics of bread and wine are changed into the essential characteristics of the Body and Blood of Jesus. The now consecrated hosts, however, keep the accidents of bread and wine. In other words, the look, smell, taste, size, shape, and so forth of bread and wine remain. This is why at Mass the bread still looks and tastes like bread. But, hidden beneath those non-essential characteristics of bread and wine is Jesus' Body and Blood, Soul and Divinity.

The Eucharist is 100% Jesus Christ, in substance. It is not just a symbol or an idea. We truly receive Jesus when we receive the Eucharist, just as He told us that He would give us His Flesh to eat and His Blood to drink as true food for the nourishment of our souls.

Answer Key

1. The words of consecration.
2. The bread and wine literally become the Body and Blood of our Lord, Jesus Christ.
3. The necessary qualities for something to be what it is. The “chair-ness” of a chair.
4. It changes into something else completely.
5. Qualities of something that, though they might be a part of that thing, do not make that thing what it is. The color of a chair, or the material it is made out of.
6. The things remains what it is. If you paint a blue chair red, it does not change into something else.
7. Transformation and substance.

1. What are the words the priest says at Mass at the Eucharist called?

2. What happens to the bread and wine when the priest speaks these words?

3. What is a substantial form? Describe the substantial form of a chair.

4. What happens if you change the substantial form of something?

5. What is an accidental form? Give an example.

6. What happens if you change an accidental form of something?

7. What are the two root words of the word “transubstantiation”?

Answer Key

8. A transformation of substance.
9. In the Eucharist, the substantial forms of the bread and wine are transformed into the substantial form of Christ's Body and Blood, Soul and Divinity. The bread and wine are literally no longer bread and wine. They do, however, keep the accidental forms of bread and wine.

Reflection Question:

Because we truly receive Jesus when we receive the Eucharist, just as He told us that He would give us His flesh to eat and His Blood to drink as true food for the nourishment of our souls.

8. What does the word "transubstantiation" mean?

9. How does the word "transubstantiation" help explain what happens in the Eucharist?

Reflection Question

Why is the Eucharist not just a symbol or an idea?

How Is This Possible?

Directions: First, read John 6:51-52, then write a 5-7 sentence paragraph that responds to the writing prompt below.

“I am the living bread that came down from Heaven; whoever eats this bread will live forever; and the bread that I will give is My Flesh for the life of the world.” The Jews quarreled among themselves, saying, “How can this man give us [His] flesh to eat?”

Imagine that you have traveled back in time and are standing in the crowd when the quarreling Jews asked: “How can this man give us His flesh to eat?” How would you answer their question?

What Is It?

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A novel				
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2. What happens to the bread and wine when the priest speaks these words?

3. What is a substantial form? Describe the substantial form of a chair.

4. What happens if you change the substantial form of something?

5. What is an accidental form? Give an example.

6. What happens if you change an accidental form of something?

7. What are the two root words of the word “transubstantiation”?

8. What does the word “transubstantiation” mean?

9. How does the word “transubstantiation” help explain what happens in the Eucharist?

Reflection Question

Why is the Eucharist not just a symbol or an idea?

How Is This Possible?

Directions: First, read John 6:51-52, then write a 5-7 sentence paragraph that responds to the writing prompt below.

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Imagine that you have traveled back in time and are standing in the crowd when the quarreling Jews asked: “How can this man give us His flesh to eat?” How would you answer their question?

Evidence for Jesus' Divinity

SUGGESTED AGE LEVEL: MIDDLE SCHOOL

Overview

In this lesson, students will begin to explore the evidence that supports the Christian belief in Jesus' divinity, and the claim that He is truly Emmanuel, "God with us." They will encounter evidence from outside the Bible, evidence from the Gospels and the rest of the New Testament, and from the witness of the Apostles themselves.

Learning Goals

- › There are sources outside of Scripture that verify Jesus' historical existence, His authority as a teacher, and His Crucifixion.
- › The earliest information we have about Jesus is found in the *kerygmas*, brief texts that proclaim in a simple way the core teachings of Christianity.
- › The Apostles' accounts of Jesus' life reveal striking patterns that give us confidence in their claims.
- › St. Paul explains how the many witnesses to the Risen Jesus had everything to lose and nothing to gain by bearing false witness to the Resurrection of Christ.



Connection to the *Catechism of the Catholic Church*

- › CCC 445
- › CCC 464–478
- › CCC 638–655

Key Questions

- › What evidence exists that supports Jesus' claim to be divine?
- › What did the Apostolic Church preach about Jesus' divinity?
- › Why are the New Testament accounts of Jesus' life trustworthy and persuasive?

BIBLICAL TOUCHSTONES

For I delivered to you as of first importance what I also received, that Christ died for our sins in accordance with the scriptures, that he was buried, that he was raised on the third day in accordance with the scriptures, and that he appeared to Cephas, then to the twelve. Then he appeared to more than five hundred brethren at one time most of whom are still alive, though some have fallen asleep.

1 CORINTHIANS 15:3–6

[I]f Christ has not been raised, then our preaching is in vain and your faith is in vain.

1 CORINTHIANS 15:14

Lesson Plan

Materials

- Handout A: More or Less Likely?
- Handout B: Historical Evidence
- Handout C: The Preaching of the Apostolic Church
- Handout D: Jesus' Resurrection in Glory
- Handout E: Evidence for Christianity Group Activity
- Handout F: Letter to a Loved One

Warm-Up

- A. Begin by distributing **Handout A: More or Less Likely?** and have students complete it in pairs. When they have finished, call on students to share and discuss their answers with the class. *Students should mark that all the statements would make them more likely to believe someone. Accept reasoned answers for the additional examples.*
- B. Next, ask your students to think to themselves for a moment about what evidence would exist 2,000 years from now that they existed and lived their lives here on this earth. What would scholars or archeologists 2,000 years from now be able to know about them and how would they know it? Allow a few minutes for discussion (which may be humorous at times).
- C. Then, point out that there will most likely be little, if any, evidence that any of us existed 2,000 years from now, especially given that so much of our records today are digital. Who is to say that there will even be a way to read the digital information of today in the far future! There may be stray fast-food receipts, random letters or photographs, and maybe even some of our collected junk that will remain to preserve a record of us. But it is highly unlikely that any of us will have detailed accounts of our lives written that will affect the course of human history after we have died. Encourage your students to think about the ancient world of 2,000 years ago and how it was even more unlikely that people would still be known 2,000 years after their death.
- D. Ask your students how we know today that Jesus historically existed 2,000 years ago. *Students will most likely respond that we know about Jesus through Scripture, and some may cite the teachings and Tradition preserved by the Church.*
- E. After allowing students to respond, ask if they are aware that there is non-biblical evidence for the existence of Jesus. Then, explain that there exists evidence from outside of the Bible that Jesus existed. This non-biblical evidence not only reveals that Jesus existed, but that He had wisdom and authority, worked miracles, attracted many followers, and was crucified under Pontius Pilate, just as the Gospels tell us. In this lesson, we will explore the early historical and first-hand accounts of Jesus' existence, as well as the evidence of His Resurrection, which is the essential foundation of the belief in His divinity.

Activity

- A. Distribute to each student **Handout E: Evidence for Christianity Group Activity**. Then, arrange your class into groups of three. Designate groups as 1, 2, or 3, and explain that each group will be given a short essay to read together. They will then work together to fill out the appropriate section of **Handout E**.
- B. Next, distribute to each group either **Handout B: Historical Evidence**, **Handout C: The Preaching of the Apostolic Church**, or **Handout D: Jesus' Resurrection in Glory**. (Make sure each handout is given to at least one group). Have each group read their essay and fill out their parts of the charts together.
- C. When they have finished, have the class jigsaw into new groups of three made up of a former 1-group, 2-group, and 3-group student. Members of each trio will take turns interviewing each other using the respective questions from **Handout E**. You may choose to have the interviewees work from their **Handout E** answers, or answer from memory.
- D. When all students have completed **Handout E**, use the answer key to review and discuss the handout questions as a class.

Wrap-Up

- A. Briefly review the checklist on **Handout A** with your students and have them help you check off the qualities satisfied by the Gospel accounts. Conclude that the Gospels are a trustworthy source for evidence of Jesus, whether or not one is a Christian.
- B. Explain that most of the evidence they have learned about today has never been heard by many who reject Christianity. Can you imagine what a difference it might make to the world if more people knew the evidence for Christ's existence and divinity? There may even be friends or loved ones in our own lives who do not know about Jesus and His love for us. Recall that a key element to persuasion is trustworthiness — if we know and trust someone, we are more willing to truly hear and consider their message. This is a vital part of our Faith — trust in God, in His divine Revelation, and in His total love for us.
- C. Next, distribute to your students **Handout F: Letter to a Loved One**. Have them imagine that a close friend or relative has asked them why they should believe in Jesus Christ. Have them write a personal letter offering evidence for the existence and divinity of Jesus, drawing from what they have learned today. They may use **Handout E** for reference.
- D. Invite students to take their letters home and share them with a friend or family member. (You may choose to have them record whether the recipient had ever heard of the evidence provided in the letter or not, and follow up at the beginning of the next class with a tally.)

More or Less Likely?

Directions: Read each statement and check off which of them would make you more likely to believe someone who told you about a miraculous event.

- ☐ The person has nothing to gain personally by convincing you.
- ☐ The person is risking personal harm to bring you this message.
- ☐ The person lists concrete details you can verify by asking other people.
- ☐ The person gives you a long list of names of other people who also witnessed this miracle.
- ☐ The person tells you how he, too, was doubtful when he first heard about this miracle.
- ☐ Other people who were there also tell you they saw the same miraculous event.
- ☐ You find out that the miracle happened a long time ago, and the story of what happened has not changed, even a little bit.
- ☐ You learn that some do not believe the event was a miracle, but those people do acknowledge that the events themselves happened.

List some other qualities that would make you more or less likely to believe someone who tells you something incredible.

Historical Evidence

God loves us and wants us to know and love Him. As the greatest sign of His love, God sent His only Son to become man. Jesus Christ is truly “God with us.”

Is there any evidence to support the claim that Jesus Christ is God? We have the Bible, first and foremost. But someone who is not Christian may not think the Bible is trustworthy. So, to help show it is reasonable to believe Jesus is God, it is important to look at sources other than the Bible.

Historical Works

Outside of the Gospels, there are three notable historical sources from the time period of the early Church. The authors who wrote them did not believe Christ was the Messiah. They were even hostile to Him! Yet they mention Him in their own historical works.

The Roman historian, Cornelius Tacitus

Cornelius Tacitus was a Roman historian. He wrote a history of Rome called the *Annals* (ca. AD 105–120). In this work, Tacitus makes a non-Christian historical reference to Jesus. He states that Jesus was executed by crucifixion at the hands of Pontius Pilate during the reign of the Roman Emperor Tiberius. This factual record perfectly matches the Gospel accounts of the life of Jesus.

The Jewish historian, Flavius Josephus

Flavius Josephus was a Jewish historian who wrote a history of the Jewish people (ca. AD 93). Next to Scripture, Josephus’ *Antiquities of the Jewish People* gives us the most detailed evidence for Jesus. Josephus cites Jesus’ Crucifixion under Pontius Pilate. He also refers to Jesus as wise, having authority, and as being a teacher and wonder-worker (miracle worker). Recall that the Jewish people of Jesus’ time did not believe He was the Messiah. The fact that a Jewish historian would mention not only Jesus’ execution by crucifixion, but also His wisdom, authority, teaching, and miracle-working shows us how widespread Jesus’ reputation was.

The Babylonian Talmud

The Talmud is a Jewish book, written between AD 50–AD 300, which compiled Jewish law and other teachings from prior centuries. It contains several references to Jesus, including His Crucifixion and His reputation for supernatural power. The Babylonian Talmud is unique as evidence since it takes a negative view of Jesus. This negative tone means that its presentation of Jesus was not influenced by Christians.

In sum, Tacitus speaks to the historical accuracy of Jesus’ trial and Crucifixion — naming both Pontius Pilate as procurator and Tiberius as Caesar. Josephus also speaks to Jesus’ Crucifixion under Pontius Pilate, clearly mentioning Jesus as wise, authoritative, and as teacher and miracle worker. And the Babylonian Talmud affirms Jesus’ Crucifixion and miracle working.

The Preaching of the Apostolic Church

God loves us and wants us to know and love Him. As the greatest sign of His love, God sent His only Son to become man. Jesus Christ is truly “God with us.” What evidence exists supporting the fact that Jesus is God?

The earliest information we have about Jesus is found in the *kerygmas*. These are short texts that proclaim the core teachings of the Gospel in a simple way (*kerygma* is Greek for “proclamation”). The first *kerygmas* were written shortly after Jesus’ Death and Resurrection. They are found in the Acts of the Apostles and the Letters of St. Paul in the New Testament.

The *kerygmas* have eight themes:

1. Jesus was a descendant of David.
2. Jesus was predicted by the Old Testament Prophets.
3. Jesus worked miracles.
4. Jesus was crucified and buried for our sins.
5. Jesus rose from the dead in glory.
6. Jesus gave His disciples the Holy Spirit.
7. Jesus is now exalted in God.
8. Jesus is the Messiah and Lord.

These claims made by Christians may not seem bold to us because we are used to hearing them. It helps to think of them and how they



St. Paul Preaching in Athens, by Raphael.

would have been heard in the context of Jesus' time. Jesus was a Jew, and God's promised Messiah to His Chosen People. But most Jews of the time did not accept this. Calling a man the Lord would have been highly blasphemous to other Jews. Calling a crucified man God would have been disgusting to everyone. Even more, the early Christians suffered terribly for their claims that Jesus is God. They lost their social and financial status, they were religiously shunned, and kicked out of the synagogue. They were even persecuted to the point of death. Why would anyone risk such suffering for claiming Jesus is God if they were not sure of the truth?

The Evidence of the Heart

The way in which the early Church preached about Jesus gives us another important piece of evidence that Jesus is God. The authors of the New Testament, as well as the preaching of the Apostles, reveal several patterns that support the truth of their claims:

1. **Restraint:** Miracles are reported as simply fact, like a news report. They are not told with exaggeration like we find in other ancient stories of miracles.
2. **Initial doubt:** The three Gospels that tell about the Risen Jesus appearing to the Apostles explain the initial doubts of the Apostles. This doubt is an honest admission if the authors meant to inspire belief.
3. **Humility:** Other embarrassing details like the insults the religious authorities leveled at Jesus or the failings and weaknesses of the Apostles (e.g. Peter's betrayal) are also included in the New Testament. This fact shows that reporting the whole truth was more important to the authors and the Apostles than making the leaders of the early Church look good.
4. **Challenging tone:** The authors of the New Testament and the Apostles did not explain away challenging teachings. This fact shows they were certain of the truth. They did not try to make that truth easier to win over more people.
5. **Inspiring:** Amazingly, laying out the mission of the Gospel without trying to soften it or downplay its challenges can be inspiring, inviting us to live up to its high calling.

The evidence from the preaching of the Church and the New Testament itself shows us that we can be confident in believing Jesus is truly God.

Jesus' Resurrection in Glory

God loves us and wants us to know and love Him. As the greatest sign of His love, God sent His only Son to become man. Jesus Christ is truly “God with us.” What evidence exists supporting the fact that Jesus is God? Specifically, how can we know that Jesus truly rose from the dead?

Belief in Jesus as God requires us to recognize our need for love and to be open to receiving that love. This openness, however, is not enough. As good-willed as we may be, our minds also need evidence for the truth that He is divine. It is for this reason the Resurrection is so central to Christianity. It is the greatest demonstration of Jesus' divine power. St. Paul even says that if Jesus did not rise from the dead, Christians are essentially wasting their time (1 Corinthians 15).

The Empty Tomb

On the third day after Jesus was crucified, His tomb was discovered empty. The empty tomb by itself is not enough to prove Jesus' Resurrection, but it does support the Apostles' claim that He rose again. After all, Jesus' body could not be found to disprove the Apostles' claim. In the Gospels, the Jewish leaders tried to discredit the news of the Resurrection by spreading the rumor that the Apostles stole Jesus' body from the tomb. They could not have made this accusation unless there really was a burial site that was found empty.

The Gospel Accounts of Jesus' Risen Appearances to the Apostles

The Gospel accounts of the Resurrection show that the Apostles were not expecting to see

Jesus again after He died on the Cross. In fact, the Gospels record how the Apostles were doubtful of the Resurrection at first. When the Risen Jesus appeared to them, Jesus had to reassure them that it was His actual body they were seeing. Several accounts show a pattern: Jesus appeared to the Apostles with a spiritually transformed body, the Apostles doubted about Him being Jesus, and Jesus proved to them that it was really He.

St. Paul's Testimony to the Resurrection of Jesus

In 1 Corinthians 15:3–8, St. Paul records a list of the witnesses to the Resurrection of Jesus. In this record he states that Jesus appeared to more than 500 people, and that most of them were still alive at the time Paul was writing. This list would have been important as legal evidence. St. Paul was saying that his audience could have heard the accounts of these witnesses in person.

After sharing the evidence of these witnesses, St. Paul then raises a dilemma: either the witnesses believed in God, or they did not believe in God. In either case, it would make no sense for them to falsely claim they witnessed the Resurrection.

For those who believed in the divinity of Jesus, lying about the Resurrection would have been a terrible crime. It would have meant rejecting their beliefs and breaking God's Commandment to not bear false witness. A believer would have risked losing his own salvation by publicly lying. It also would have undermined the Faith and caused many people to leave the Church. So, it



Resurrected Jesus Christ with Thomas the Apostle, by Sebastiano Santi.

would make no sense for a believer in Jesus to lie about the Resurrection.

Those who did not believe in the divinity of Jesus would also have had to make great sacrifices to preach the Resurrection. Belief in the Resurrection set the early Christians at odds with the Jews and the Roman authorities. Lying about witnessing the Resurrection would have led to active persecution, torture, and

death. Why would an unbeliever willingly put himself in so much danger for a lie he did not even believe?

This dilemma shows that both believers and unbelievers alike had everything to lose and nothing to gain by bearing false witness to the Resurrection of Christ. The most reasonable conclusion is that these witnesses were telling the truth.

Evidence for Christianity Group Activity

Directions: Read your assigned essay with your group and answer the appropriate questions in the chart below (corresponding to **Handouts B, C, or D**). Then, switch groups and work with your new partners, using the questions to interview each other until you have all filled out the remainder of your charts.

Historical Evidence	
Who was Cornelius Tacitus? What did he write and what does it tell us about Jesus?	
Who was Flavius Josephus? What did he write and what does it tell us about Jesus?	
What is the Babylonian Talmud? What does it tell us about Jesus and why is it especially notable?	

Preaching of the Apostolic Church

**What is a *kerygma*?
Where have the
kerygmas been
preserved?**

**What are the eight
repeated themes of
the *kerygmas*?**

**What did the early
Christians often
face for holding to
the claims of the
kerygmas?**

**What five patterns
or characteristics
are present in the
New Testament that
give us confidence in
its authors? Briefly
explain each.**

Jesus' Resurrection in Glory	
<p>What indirect evidence does the empty tomb give us about Jesus' Resurrection?</p>	
<p>What is the general pattern of the Resurrection narratives? Why is this notable?</p>	
<p>What list does St. Paul provide in 1 Corinthians 15? Why is this list noteworthy?</p>	

Jesus' Resurrection in Glory *(continued)*

What dilemma does St. Paul raise in 1 Corinthians 15? What would this mean for one who believed in the divinity of Jesus?

What would St. Paul's dilemma mean for someone who did not believe in the divinity of Jesus?

Dear _____,

[illegible]

Answer Key

Handout D: Evidence for Christianity Group Activity

Historical Evidence	
Who was Cornelius Tacitus? What did he write and what does it tell us about Jesus?	A Roman historian who provides a non-Christian historical reference to Jesus, recording that Jesus was executed by crucifixion at the hands of Pontius Pilate during the reign of the Roman Emperor Tiberius. This information corresponds with the Gospel accounts.
Who was Flavius Josephus? What did he write and what does it tell us about Jesus?	A Jewish historian writing a history of the Jewish people for a Roman audience in approximately AD 93. In his <i>Antiquities of the Jewish People</i> , Josephus cites Jesus' Crucifixion under Pontius Pilate, and refers to Jesus as wise, having authority, and as a teacher and a wonder-worker (miracle worker). This reveals Jesus' widespread reputation.
What is the Babylonian Talmud? What does it tell us about Jesus and why is it especially notable?	A Jewish source text, written between AD 50–AD 300 that compiled Jewish oral law and other rabbinical material from prior centuries. It contains several references to Jesus, including His Crucifixion and His reputation for supernatural power. The Babylonian Talmud is especially notable as evidence since the passages indicate a rabbinical hostility toward Jesus. Their negative tone cancels any suspicion of Christian influence.
Preaching of the Apostolic Church	
What is a kerygma? Where have the kerygmas been preserved?	A brief text that proclaims in a simple way the core teachings of the Gospel message. Kerygma is Greek for “proclamation”. They have been preserved in the New Testament within the Acts of the Apostles and the Letters of St. Paul.
What are the eight repeated themes of the kerygmas?	<ol style="list-style-type: none"> 1. Jesus was a descendant of David 2. Jesus was predicted by the Prophets 3. Jesus worked miracles 4. Jesus was crucified and buried for our sins (in all major kerygmas) 5. Jesus rose in glory (in all major kerygmas) 6. Jesus gave His disciples the Holy Spirit 7. Jesus is now exalted in God 8. Jesus is, therefore, Messiah and Lord

<p>What did the early Christians often face for holding to the claims of the kerygmas?</p>	<p>The early Christians suffered terribly for their claim of Jesus' divinity. They lost their social and financial status, were religiously ostracized and ultimately expelled from the synagogue, and were persecuted to the point of death.</p>
<p>What five patterns or characteristics are present in the New Testament that give us confidence in its authors? Briefly explain each.</p>	<ol style="list-style-type: none"> 1. <i>Restraint:</i> Miracles are reported in simple factual prose, like a news report, without the dramatic embellishment we find in any other ancient story of miracles. 2. <i>Initial doubt:</i> All three Gospel accounts of Jesus' risen appearance to the Apostles report the initial doubts of the Apostles, a notably honest admission for an account intending to inspire belief. 3. <i>Humility:</i> Unflattering details like the insults the religious authorities leveled at Jesus or the failings and weaknesses of the Apostles (e.g. Peter's betrayal) are also included, indicating that reporting the whole truth was more important than making the early Church leaders look good. 4. <i>Challenging tone:</i> The restrained reporting, honest inclusion of unpleasant details, and refusal to explain away challenging teachings all convey a tone of authors who are convinced of the truth of what they are reporting but who are not trying to soften the difficulty of that truth to win people over with a flattering presentation. They are earnest in their faith. 5. <i>Inspiring:</i> laying out the mission of the Gospel without trying to soften it or downplay its challenges can be inspiring, inviting us to aspire to its high calling.
<p>Jesus' Resurrection in Glory</p>	
<p>What indirect evidence does the empty tomb give us about Jesus' Resurrection?</p>	<p>When the Apostles began gaining converts by preaching the Resurrection, it was in the interests of the Jewish authorities to undermine this claim by producing the body of Jesus. They were unable to do this, pointing to the likelihood that the body really was not in the tomb. Even more, in the Gospels, the Jewish authorities charge that the Apostles stole Jesus' body (an accusation that would not be necessary unless there was an identifiable burial site that was now empty). It is unthinkable that the Christians would have reported such a damaging claim to their own credibility in the Gospel (Matthew 28:13) unless it were true. The empty tomb also indicates that it was Jesus' same body that was buried and later raised and left the tomb transformed in glory.</p>

What is the general pattern of the Resurrection narratives? Why is this notable?	<i>Jesus appears to His disciples as a spiritually and gloriously transformed body, the Apostles initially doubt that it is Jesus they see, and Jesus proves to them that it is really He. It is noteworthy because Jesus Himself reassured them (and us) that it was really He and really His actual body.</i>
What list does St. Paul provide in 1 Corinthians 15? Why is this list noteworthy?	<i>In 1 Corinthians 15:3–8, St. Paul records a list of witnesses to the Resurrection. St. Paul mentions that there are more than 500 witnesses of the risen Christ, and that they are still alive at the time of his writing. This indicates that St. Paul offered the list of witnesses as sound, legal evidence for the Resurrection.</i>
What dilemma does St. Paul raise in 1 Corinthians 15? What would this mean for one who believed in the divinity of Jesus?	<i>Either the witnesses he listed believed in God, or they did not believe in God. In either case, Paul argues, they had everything to lose and nothing to gain by falsely claiming to have witnessed the Resurrection. For a believer to publicly lie that he had witnessed the Resurrected Christ, he would have put his own salvation in jeopardy by bearing false witness that undermined and caused apostasy to the Jewish faith. Lying about the Resurrection represented the worst possible crime in the eyes of St. Paul. The witnesses of the Risen Christ, if they were believers, had everything to lose and nothing to gain by publicly lying about the Resurrection (causing apostasy), for they were jeopardizing their eternal salvation.</i>
What would St. Paul's dilemma mean for someone who did not believe in the divinity of Jesus?	<i>Those who did not believe in God would also have had to make great sacrifices to preach the Resurrection, which would have made lying about it senseless. Such a lie would have brought needless suffering onto oneself.</i>

Notes

Scientific Evidence for Eucharistic Miracles

SUGGESTED AGE LEVEL: MIDDLE SCHOOL

Overview

Are Eucharistic miracles real? Or are they just made-up stories designed to amaze the gullible? In this lesson students will examine the scientific evidence for Eucharistic miracles and read some recent accounts of Eucharistic miracles that they may not have heard before. As with the Resurrection, the evidence supporting Christ's Real Presence in the Eucharist is more extensive than they might first think!

Learning Goals

- › Eucharistic miracles are rare external signs of Jesus' Real Presence in the Eucharist.
- › Recent Eucharistic miracles have occurred in Tixtla, Mexico; Buenos Aires, Argentina, and Sokółka, Poland.
- › While evidence alone will not move us to Faith, it can enhance our faith and love for the Lord.



Connection to the *Catechism of the Catholic Church*

- › CCC 35
- › CCC 1406
- › CCC 1413
- › CCC 1418

Key Questions

- › Considering that the Sacrament of the Eucharist is miraculous by nature, what is meant by the term "Eucharistic miracle"?
- › What evidence supports the accounts of the Eucharistic miracles that took place in Mexico, Argentina, and Poland?
- › What is the relationship between evidence and faith?

BIBLICAL TOUCHSTONES

And the Word became flesh and made His dwelling among us, and we saw His glory, the glory as of the Father's only Son, full of grace and truth.

JOHN 1:14

He who eats my flesh and drinks my blood abides in me, and I in him.

JOHN 6:56

Lesson Plan

Materials

- › Handout A: The Incredulity of St. Thomas
- › Handout B: Tixtla, Mexico
- › Handout C: Buenos Aires, Argentina
- › Handout D: Sokółka, Poland
- › Handout E: Faith and Eucharistic Miracles
- › A Bible, a set of markers, and a piece of poster board for every group of 2-3 students

Warm-Up

- A. Arrange students into pairs or trios and give each group a Bible and a copy of **Handout A: The Incredulity of St. Thomas**. Ask them to take a few minutes to look at the image. You may also wish to project it.
- B. Have your students discuss the conversation questions with each other. During this time, focus on keeping students attention on the artwork and the questions, letting their conversations go in unexpected directions.
- C. Reconvene the class and discuss the conversation questions as a large group.
- D. Ask the class to silently reflect for a moment on the extent to which they ever feel like St. Thomas did. In what ways does our Catholic Faith mean we believe in things we cannot necessarily see with our own eyes? *Accept reasoned answers. If students do not mention it, offer the example of how when we receive Holy Communion, we receive Jesus Himself under the appearance of bread and wine.*

Activity

- A. Ask for a volunteer to explain what happens at every Mass when the priest says the words of consecration. *The bread and wine become the Body, Blood, Soul, and Divinity of Jesus Christ. The Church calls this miraculous process Transubstantiation.*
- B. Explain that the act of Transubstantiation is itself miraculous, but the term Eucharistic miracle usually refers to rare external signs of Jesus' presence in the Eucharist – most notably bleeding hosts, or a consecrated host becoming a piece of cardiac (heart) muscle tissue.
- C. Ask the class if anyone is familiar with any Eucharistic miracles and allow them to share what they know.
- D. Arrange students into pairs or trios and give each group a piece of posterboard and a set of markers. Distribute to each group one of the following handouts on Eucharistic miracles: **Handout B: Tixtla, Mexico; Handout C: Buenos Aires, Argentina; or Handout D: Sokółka, Poland**. Have each group read their assigned handout together.
- E. When they are finished, have each group work together to create a 6-panel (or longer) comic strip on their posterboard showing what happened when their assigned Eucharistic miracle was discovered, the steps taken in each investigation, and the results of scientific analysis.

Wrap-up

- A. Have students present and discuss their comic strips with the class.
- B. After all groups have presented, explain that these three Eucharistic miracles are a very small sample of miracles from throughout the centuries. They are recounted here because they have been subject to considerable scientific scrutiny by experts who are believers and non-believers. These miracles help give credence to the Christian Faith, the Risen Jesus, and His Real Presence in the Eucharist. Ultimately, however, this evidence is not necessary for faith. Remember that Christ told St. Thomas “Blessed are those who have not seen and yet believe” (John 20:29). Our hearts must be open to belief. If we are not open, no amount of evidence can move our hearts to faith.
- C. Distribute **Handout E: Faith and Eucharistic Miracles** and have students complete it for homework.
- D. Discuss for a moment how when Sr. Julia, the sacristan in Poland, saw the bleeding host, she said she felt like Moses in front of the burning bush. Most of us will not witness a miraculous event like Sr. Julia did, but we all have the chance to behold the Lord Himself! We can do this at every Mass and in Eucharistic adoration, “Because Christ himself is present in the sacrament of the altar, he is to be honored with the worship of adoration. ‘To visit the Blessed Sacrament is . . . a proof of gratitude, an expression of love, and a duty of adoration toward Christ our Lord’” (CCC 1418).
- E. Finally, if possible, take your class to visit Our Lord in an Adoration chapel for 10-15 minutes of silent prayer. Remind them that if they ever feel like St. Thomas, they may ask the Lord to strengthen their faith.

Optional Extension

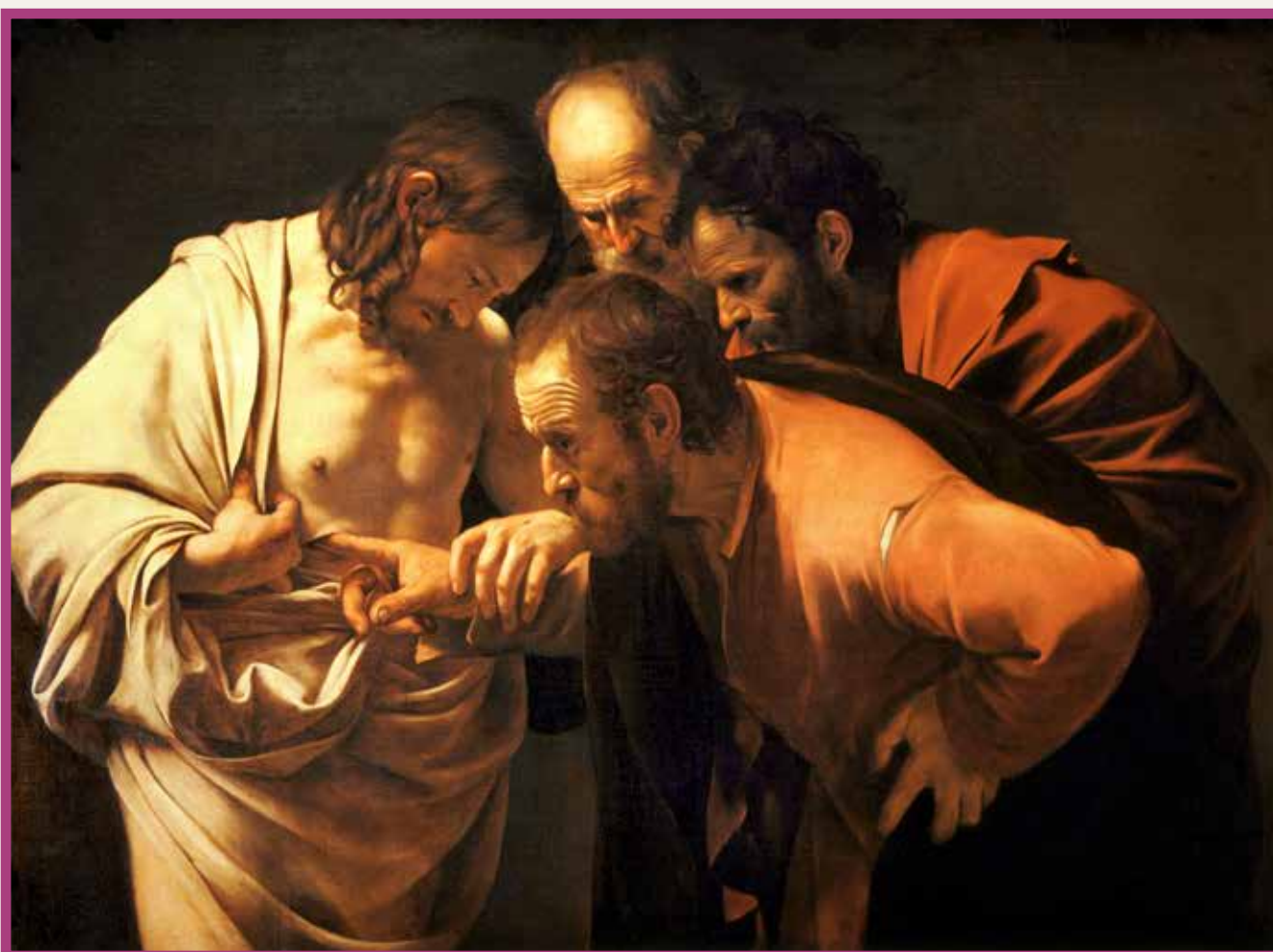
If time permits, you may watch with students any or all of these short videos on each of the miracles studied in this lesson, found at:

- › SophiaOnline.org/Poland
- › SophiaOnline.org/Tixtla
- › SophiaOnline.org/BuenosAires
- › SophiaOnline.org/BuenosAiresDocumentary

HANDOUT A

The Incredulity of St. Thomas

BY CARAVAGGIO (CA. 1601-1602)



The Incredulity of St. Thomas

Directions: Take some time to quietly view and reflect on the art. Let yourself be inspired in any way that happens naturally. Then, think about the questions below and discuss them with your classmates.

Conversation Questions

1. Who are the figures in this painting?
2. What do you notice first about this painting?
3. How does this painting make you feel?
4. How would you describe the way Jesus looks?
5. Read **John 20:24–25**. What do we learn about St. Thomas in this Scripture passage?
6. Read **John 20:26–29**. How does Jesus respond to St. Thomas's doubt?
7. Having viewed this painting, and read the story of St. Thomas' doubt, what can we learn about how God responds to us if we ever struggle to believe in Him?

Tixtla, Mexico

Tixtla is a town of 23,000 people in southwestern Mexico.

Fr. Leopoldo Roque of St. Martin of Tours parish held a spiritual weekend retreat for his parishioners in October 2006. He invited a famous preacher he knew, Fr. Raymundo Reyna Esteban (known as “Fr. Rayito”), to take part.

On Sunday, October 22, 2006, the two concelebrated the Mass at the end of the retreat. There were about 600 people who could not fit inside the church, so the Mass was offered at the nearby town hall. Two nuns were helping with the distribution of the Eucharist for Holy Communion. One of them, Sr. Arely Marroquín, was holding a ciborium full of consecrated hosts when she suddenly paused and turned pale.

The woman who had been right in front of Sr. Arely witnessed what happened next. The nun returned to the altar with teary eyes. She knelt without saying a word and showed the ciborium to Fr. Rayito. One of the hosts was stained with blood. It had a moist, crumbly texture, so much so that a small fragment had come off it by gently touching it. Fr. Rayito and Fr. Leopoldo quickly talked to one another until Fr. Rayito loudly spoke out, “This is a miracle!” He publicly showed the host that was stained by a few drops of fresh blood. With his booming voice, he began singing “*Que viva mi Cristo, que viva mi Rey*,” a hymn well known to all Mexicans. Some people applauded and some people wept. Looking back, Fr. Rayito remembered that moment as “shocking, but also simple, sublime and eternal at the same time.”

In the following weeks, the bishop began establishing facts through interviews.

Seventeen statements were given by different people which confirmed what had happened. The bishop then put Dr. Ricardo Castañón in charge of overseeing the investigations on the Tixtla host. He authorized Dr. Castañón to take small samples of the material. The bishop specifically asked to learn if the blood-like substance had been added to the host from the outside, or if it actually originated from the inside. The bishop thought it was important to rule out fraud.

Dr. Castañón sampled three millimeter-sized fragments of the apparently bloodstained host. Then, a series of investigations began that were finally concluded on February 25, 2013. Dr.

Castañón relied on several forensic medical laboratories in Mexico, Guatemala, Bolivia, and the US that specialized in immunohistochemistry and genetics. During the course of the analyses, the same findings were often verified multiple times by different scientists. The scientists themselves were also unaware of each other’s tests and worked under “blind” conditions — that is, they did not know the origin of the material they were testing.

Results

1. **Human Blood was found:** A laboratory in Bolivia documented the presence of hemoglobin (the substance in blood that carries oxygen).
2. **The blood group was AB.** Two independent laboratories in Mexico and Bolivia demonstrated the presence of A and B

antigens (the substances in our bodies that stimulate an immune response) with immuno-fluorescence techniques on the tissues examined.

3. There were cellular fibers belonging in all likelihood to **heart muscle**.
4. **There was human DNA, but no genetic profile could be obtained.** Two independent

laboratories in Mexico and Guatemala both reached the same conclusion.

5. Under a superficial layer of clotted blood, **fresh blood was still present in contact with the host**.
6. **The blood arose from within the host.** Two studies ruled out the hypothesis that the blood could have wetted the surface of the host from the outside.

**This report is adapted from A Cardiologist Examine Jesus, by cardiologist and author Dr. Franco Serafini.*

Buenos Aires, Argentina

Buenos Aires, the capital of Argentina, is a busy city of around 3 million people.

The red brick church of St. Mary's is barely a hundred years old. It has a common but dignified look, like that of the surrounding neighborhood. At the end of the distribution of Holy Communion at the 7:00 p.m. Mass on Sunday, August 18, 1996, one of the faithful turned to the priest celebrant, Fr. Alejandro Pezet. She was embarrassed. She had noticed a host hidden in the base of a candlestick in front of the crucifix. Fr. Alejandro picked up the abandoned host. He thought of consuming it himself, but it was too dirty and dusty. He asked Emma Fernandez — a seventy-seven-year-old extraordinary minister of the Eucharist — to immerse it in water and lock it in the tabernacle.

Mrs. Fernandez, the only lay person who had access to the tabernacle, saw something strange in the round glass container she had left in it and discussed what she saw with Fr. Pezet on August 26. Fr. Pezet also noticed that the host was transforming into something else, something red in color. The red color would grow in the following weeks. He immediately suspected a supernatural cause for what was happening. He informed the curia, and Bishop Jorge Mario Bergoglio (the future Pope Francis), one of the four auxiliary bishops of Buenos Aires at the time, recommended taking professional photographs to begin with.

The dissolving host was less and less distinguishable, although the water was made more and more turbid by a red cloud-like substance and darker jelly-like clumps whose texture resembled that of clotted blood. After

about a month, the leftover foreign material was transferred to a closed bottle of distilled water.

After three years, the bloody tissue — unaccountably — had not decomposed. Archbishop Bergoglio asked that the tissue be scientifically examined, and it was sent to a scientific committee in New York (whose members were not told of the source).

Results

1. The committee determined the sample was a fragment of **heart muscle** taken from the left ventricle.
2. The blood type was **AB positive**.
3. **White blood cells** were present (indicating the heart was **alive** when the tissue fragment was taken) and embedded in the tissue (indicating great stress to the heart, as from the person's chest being severely beaten).
 - ▶ On April 20, 2004, the investigators were in the office of the chief medical examiner and cardiologist in Rockland County, New York, Prof. Frederick Zugibe.
 - ▶ Zugibe scrutinized the samples under the microscope and said: "I am a heart specialist. The heart is my business. This is heart muscle tissue, coming from the left ventricle, near a valvular area." He took a better look and specified: "This cardiac muscle is inflamed; it has lost its striations and is infiltrated by leukocytes [white blood cells]....This was a live sample at the time it was taken."

- The researchers asked how long the leukocytes would survive if the tissue were set in water. He answered, “They would dissolve within a few minutes and no longer exist.”
- The two researchers then revealed that the slide came from tissue kept for a month in tap water and for three years in distilled water, and Zugibe exclaimed, “Absolutely incredible! Inexplicable by science!”
- Later he would specify that after such a long period in water, not only would white blood cells disappear, but also any other human cell would lose any recognizable morphology.
- Only in hindsight, and to his amazement, they revealed to him that the tissue originated from a consecrated host.

**This report is adapted from A Cardiologist Examine Jesus, by cardiologist and author Dr. Franco Serafini.*

Sokółka, Poland

Sokółka is a small and quiet town of about 20,000 people in northeastern Poland.

October 12, 2008, was a Sunday like many others at St. Anthony of Padua Church in Sokółka. Fr. Filip Zdrodowski was saying the 8:30 am Mass. Another priest, Fr. Jacek Ingielewicz, was helping distribute Holy Communion. Suddenly, a woman kneeling at the altar rail touched Fr. Jacek's leg. With a glance, she showed him a host which had been dropped on the first step of the altar. Fr. Jacek picked up the host. It was dirty, and he decided not to consume it but rather to immerse it in water in the vasculum (a silver container used for the cleansing of hands). At the end of Mass, Fr. Jacek put the host-containing vasculum inside the tabernacle.

On the same day, parish priest Msgr. Stanisław Gniedziejko noticed the water container that had been unusually stored inside the tabernacle. He asked Sr. Julia Dubowska, the parish sacristan, to pour the contents of the vasculum into a larger glass vase, add water to it, and lock it in the sacristy's safe. Only the two of them had keys to that safe. The nun diligently did what she was told but she was curious about the unusual event. She kept checking the vase in the safe every day over the following week.

On the morning of Sunday, October 19, Sr. Julia opened the safe and smelled a bread fragrance. She thought it was from the dissolution of the host, but that was not the case. Looking back, Sr. Julia said when she looked at the vase, she felt like Moses in front of the burning bush! Part of the host had not yet dissolved and was partially covered by a red stain that looked like



Image courtesy of St. Anthony of Padua in Sokolka, Poland.

a clot. Yet the water in the container remained clear.

A few days later, the Archbishop and his chancellor came to St. Anthony's Parish to verify the facts. The bishop asked to have the host kept in reverent custody. So, on October 29, the vase was moved from the safe to the tabernacle of a small Divine Mercy chapel a short distance away.

Then, on October 30, the parish priest used a small spoon to separate the mysterious red clot from the water and laid it on a small corporal, as advised by the bishop. A small red cross was embroidered in the center of the corporal, and the clot partially covered it. The corporal was then inserted in a transparent monstrance and kept in the tabernacle. By mid-January 2009, the mysterious material was fully dried out and

tightly clinging to the linen fabric on which it had been laid. Even after many years, the Sokółka relic has maintained the same look.

The archbishop commissioned two anatomical pathologists from the University of Białystok to study the material: Prof. Stanisław Sulkowski and Prof. Maria Elżbieta Sobaniec-Łotowska. In the following weeks, the material was processed and studied under both a light microscope and a transmission electron microscope.

Results

1. The sampled material was **myocardial tissue (heart tissue)**.
2. Pathological signs show the tissue to have been taken **from a living person**. Segmentation and fragmentation were

present; these come from the rapid, repeated spasms of heart muscle cells near death (it does not take place after death). **It can only happen in a living heart muscle cell.**

3. The appearance of some muscle fibers was in keeping with contraction band necrosis (CBN), caused by a condition known as **stress-induced cardiomyopathy**.
4. There was **human DNA**, but no genetic profile could be obtained.
5. As with other Eucharistic miracles, the persistence of myocardial tissue along with the unleavened host bread is **inexplicable**. Both are intact, without signs of decay or degradation in the absence of any preservative.

**This report is adapted from A Cardiologist Examine Jesus, by cardiologist and author Dr. Franco Serafini.*

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Answer Key

Handout A: The Incredulity of St. Thomas

1. Jesus, St. Thomas and other Apostles.
2. Accept reasoned answers.
3. Accept reasoned answers.
4. Students may say He looks open, welcoming, or to be offering Himself.
5. Thomas doubted. The Risen Jesus had appeared to the Apostles, but St. Thomas was not with them at the time. Thomas said unless he saw and touched Jesus, he would not believe He had risen from the dead.
6. Jesus offers to let Thomas see and touch him.
7. If we struggle to believe, Jesus does not look passively on our struggle. While He noted that those who believed without seeing the proof were blessed, Jesus was not angered or impatient with Thomas. We also can ask Him to strengthen our Faith.

Handout E: Faith and Eucharistic Miracles

Accept reasoned answers for both prompts.

What Is the Shroud of Turin?

SUGGESTED AGE LEVEL: MIDDLE SCHOOL

Overview

The Shroud of Turin is a burial cloth that bears the image of a crucified man. This image perfectly matches the description of the wounds Jesus suffered during His Crucifixion. Modern science has shown the image to be anatomically accurate and that it could not have been produced by any kind of paint, dye, chemical, vapor, or scorching. All the evidence suggests that the Shroud of Turin is the burial cloth of Christ mentioned in the Gospels. This precious relic is powerful testimony to our faith in Christ, the historicity of His Resurrection, and His claims to be divine.

Learning Goals

- › The Shroud of Turin contains a miraculous image of a crucified man that all evidence suggests is Jesus Christ.
- › The shroud has undergone numerous scientific investigations over the years that all support the authenticity of the shroud and its image.
- › The empirical evidence presented by the shroud strongly supports the accuracy of the Gospel accounts of Jesus' Crucifixion and Resurrection.



Connection to the Catechism of the Catholic Church

- › CCC 606–630
- › CCC 638–640
- › CCC 651–655

Key Questions

- › What is the Shroud of Turin?
- › How was the image on the shroud formed?
- › How does the evidence support the Gospel accounts of Jesus' Crucifixion and Resurrection?

BIBLICAL TOUCHSTONES

And he bought a linen shroud, and taking him down, wrapped him in the linen shroud, and laid him in a tomb which had been hewn out of the rock; and he rolled a stone against the door of the tomb.

MARK 15:46

Then Simon Peter came, following him, and went into the tomb; he saw the linen cloths lying, and the napkin, which had been on his head, not lying with the linen cloths but rolled up in a place by itself.

JOHN 20:6–7

Lesson Plan

Materials

- Handout A: What Is the Shroud of Turin?
- Handout B: Gospel Accounts of Jesus' Crucifixion
- Handout C: Examining the Shroud Image

Homework

Distribute to your students and have them read **Handout A: What Is the Shroud of Turin?** and answer the focus and reflection questions.

Warm-Up

- Begin by reviewing and discussing the focus and reflection questions from **Handout A: What Is the Shroud of Turin**, which was assigned for homework.
- Next, review with your students that the Shroud of Turin is a 14-foot-long linen burial cloth that bears the image of a man. From examining the image, we can tell the man has a beard and mustache, and shoulder-length hair parted in the middle. He was muscular and stood between 5 feet 7 inches and 6 feet 2 inches tall. The shroud is bloodstained, and the man appears to be wounded, indicating he was tortured before his death. In fact, the image on the shroud matches the Bible's report of Jesus' Crucifixion in very specific ways.
- Then, distribute to your students **Handout B: Gospel Accounts of Jesus' Crucifixion** and have them read the Gospel accounts of Jesus' Crucifixion and identify the key details reported by the Gospels of Jesus' suffering, Crucifixion, and Death on the Cross.
- When they have finished, review and discuss the correct answers.
- Explain to your students that the Gospels tell us that Jesus was beaten, scourged, wore a crown of thorns, was nailed to a cross (while most crucified by the Romans were tied with rope), and His side was pierced by a spear (to speed up His Death so He could be removed from the Cross and buried before Passover began, which was not the usual Roman practice – they typically tried to extend a person's suffering as long as they could). For these reasons (and others we will learn about in the next lesson), there is good reason to believe the Shroud of Turin is the burial cloth of Jesus Christ.

Activity

- A. Begin by distributing to your students **Handout C: Examining the Shroud Image** and have them look carefully at the image.
- B. Point out that they are looking at the image of a man from the front and the back. Explain that it looks this way because the man was laid on the shroud, and it was folded over the top of him.
- C. Next, go through each of the items listed below and, using the answer key, help your students identify and label each one on the shroud image.
 1. Large round wound from piercing on one wrist and both feet. (The other wrist is hidden.)
 2. An upward gouge penetrating the side into the rib cage.
 3. Small punctures around the forehead and scalp.
 4. Many linear gashes throughout the body.
 5. Swelling of the face.
 6. Streams of blood down both arms.
- D. Then, arrange your students into pairs or groups of three or four and have them work together to provide an explanation for each item labeled on the shroud image. Students may refer back to **Handout A** and **Handout B** for help.
- E. When they have finished, call on groups to share and discuss their responses.

Wrap Up

- A. On their own paper, have students journal a response to the following question:

Why do you think the Shroud of Turin has been so important to the faith of so many people over the centuries?
- B. When they have finished, call on students to share and discuss their answers. Help them come to the recognition that the shroud is a tantalizing relic of Christ's suffering, Death, and Resurrection. It mysteriously connects us not only to the past (and the most important events of human history) but also to our own mysterious resurrection at the end of time.

What Is the Shroud of Turin?

The Shroud of Turin is a unique piece of historical evidence that Jesus Christ is God – if it is indeed His burial shroud.

The Shroud of Turin is a simple burial cloth made out of linen. It measures roughly 14 feet long by 3 ½ feet wide. It bears a striking image – a perfect photographic negative – of the front and back of what appears to be a crucified man. Though it is almost certainly much older, the first recorded reports of the shroud date to 1349 – almost 500 years before the photographic camera was even invented. Over the years, some have claimed that the shroud is a forgery created in the Middle Ages. In recent decades, however, extensive scientific testing strongly suggests that it is real.

Modern dating techniques place the origin of the shroud in the Holy Land around the time

of Christ. The image of the man in the shroud shows such accurate anatomical detail that modern medicine can use it to diagnose many of the injuries the man suffered. Amazingly, these injuries match the description of Jesus' Crucifixion in the Gospels. Both Jesus and the man in the shroud suffered unusual injuries. They were crowned with thorns, flogged, and pierced in the right side by a Roman spear. Most intriguing of all, scientific tests have revealed the image was not produced by any kind of paint, dye, chemical, vapor, or scorching. This fact seems to leave only supernatural explanations for how the image was formed.

In addition to the anatomically perfect image itself, several blood stains also appear on the shroud. The blood had congealed on the cloth before the image was formed. Yet the location



and flow of the blood precisely match where they appear on the image of the body. If the shroud were a forgery, its creator would have had to perfectly place all the blood stains on the cloth before there was an image on which to place them. Doing so would have been an extremely difficult (if not impossible) task, even before we consider how the image itself was put on the shroud without any paints, dyes, chemicals, vapors, or scorching.

Given all this evidence, the Shroud of Turin seems to have wrapped a real man who was crucified in a way that matched the unique manner in which Jesus Christ was crucified.

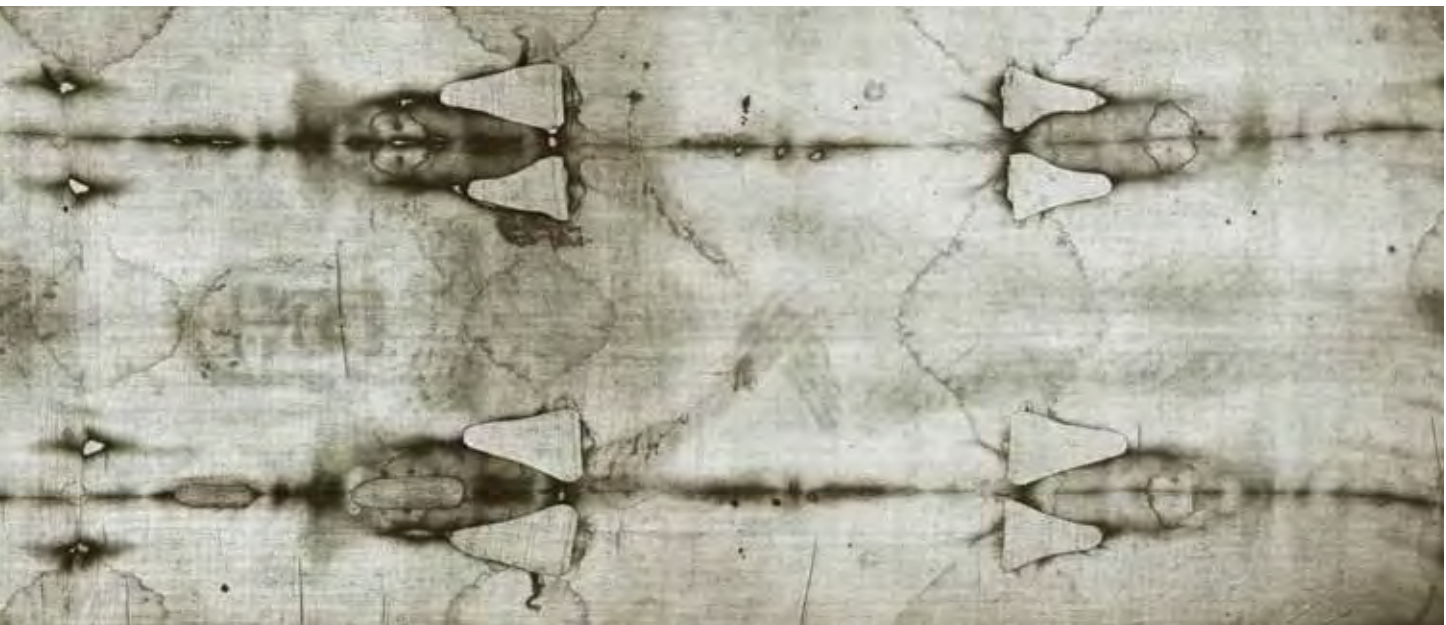
How Was the Image on the Shroud Formed?

There are many striking features about the image on the Shroud of Turin that science cannot explain.

First, the image appears only on the uppermost surface of the cloth. The image

does not penetrate into the cloth's fibers anywhere. This fact not only means paint and dyes could not have been used to create the image; it shows that the image was not produced by chemicals, vapors, or scorching of any kind. The most likely remaining explanation is that it was caused by light radiation (but, significantly, not by heat radiation). The image is also not a scorch, but rather discoloration coming from dehydration. This fact implies that the image could not have been produced by slowly dissipating radiation (which would have scorched it). The burst of light radiation that created the image would have had to be very brief and intense.

Second, the image is a perfect photographic negative, in which the image intensity is related to the distance of the cloth from the body. In other words, the image is present on the cloth regardless of whether a particular portion of the cloth touched the body or not. This fact again implies that radiation — not chemicals or vapors — was the source of image formation. The kind of light radiation that might fit these



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conditions is called vacuum ultraviolet radiation. In fact, in 2010, scientists successfully reproduced the kind of surface coloration found on the shroud by firing a burst of vacuum ultraviolet radiation through an excimer laser at a linen with exactly the same characteristics as the shroud. Based on their results, they concluded that the image produced on the shroud would have required an incredibly brief and intense burst of radiation equal to one million ten-thousand-watt search lights focused on a single spot seven feet in length. Only something very transformative and supernatural could have caused a dead body to produce such a powerful burst of radiation necessary to produce this image.

Third, parts of the image are resolvable into three dimensions. The inside skeletal parts of the hands (on the frontal image) and backbone (on the dorsal, or rear, image) are proportionately related to the surrounding exterior flesh. In other words, the radiation that discolored the cloth came from every point of the body equally, inside and outside. This fact implies that the cloth collapsed into and through the body it wrapped.

Fourth, there is a double image on the frontal part of the shroud. A more intense image appears on the front surface of

the cloth — nearest the body — and a less intense image on the back surface of the cloth — furthest from the body. This detail suggests that the radiation that created the image surrounded both the front and back surfaces of the frontal part of the shroud, further implying that the cloth collapsed into and through the body. It is obviously scientifically unheard of for a body to become physically transparent in such a way that solid objects like cloth can pass through it.

Who Is the Man on the Shroud?

Given this analysis, we must consider the parallels between the details of Jesus' Resurrection and the details of the figure on the shroud and how it was produced. There is no natural explanation for a deceased body to suddenly produce a burst of billions of watts of radiation in a fraction of a second and at the same instant gain a spirit-like physical transparency that enables solid matter to pass through it. We must conclude that there was some kind of supernatural cause. The description of Jesus' resurrected spiritual body in the Gospel narratives (and the letters of St. Paul) point quite convincingly to the Risen Jesus as the origin of the image.

Focus and Reflection Questions

1. What is the Shroud of Turin? When was the shroud discovered?
2. How does the shroud correspond with the Crucifixion account in the Gospels?
3. How do the blood stains on the cloth provide evidence that the shroud is not a forgery and was used to wrap Jesus' body?
4. How do we know that the image on the Shroud is not from paints, dyes, chemicals, vapors, or scorching?
5. What evidence do we have specifically that the image came from vacuum ultraviolet radiation?
6. What evidence implies that the cloth collapsed into and through the body? How does this evidence support the Resurrection?

Gospel Accounts of Jesus' Crucifixion

Directions: Read the following excerpts from the Gospels about Jesus' Passion, Crucifixion, Death on the Cross, and burial. Then, for each passage, identify and record what it tells us about what Jesus suffered or what was done to Him. .

1. [Pilate] had Jesus flogged, and handed him over to be crucified. The soldiers led Jesus away into the palace (that is, the Praetorium) and called together the whole company of soldiers. They put a purple robe on him, then twisted together a crown of thorns and set it on him. And they began to salute him, "Hail, King of the Jews!" And they struck his head with a reed, and spat upon him, and they knelt down in homage to him. And when they had mocked him, they stripped him of the purple cloak, and put his own clothes on him. And they led him out to crucify him. — *Mark 15:15–20*

2. So they took Jesus, and he went out, bearing his own cross, to the place called the place of a skull, which is called in Hebrew Gol'gotha. There they crucified him, and with him two others, one on either side, and Jesus between them. — *John 19:17–18*

3. Since it was the day of Preparation, in order to prevent the bodies from remaining on the cross on the sabbath (for that sabbath was a high day), the Jews asked Pilate that their legs might be broken, and that they might be taken away. So the soldiers came and broke the legs of the first, and of the other who had been crucified with him; but when they came to Jesus and saw that he was already dead, they did not break his legs. But one of the soldiers pierced his side with a spear, and at once there came out blood and water. — *John 19: 31–34*

4. After this Joseph of Arimathe'a, who was a disciple of Jesus, but secretly, for fear of the Jews, asked Pilate that he might take away the body of Jesus, and Pilate gave him leave. So he came and took away his body. Nicodemus also, who had at first come to him by night, came bringing a mixture of myrrh and aloes, about a hundred pounds' weight. They took the body of Jesus, and bound it in linen cloths with the spices, as is the burial custom of the Jews. Now in the place where he was crucified there was a garden, and in the garden a new tomb where no one had ever been laid. So because of the Jewish day of Preparation, as the tomb was close at hand, they laid Jesus there. — *John 19:38–42*
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5. Now Thomas, one of the twelve, called the Twin, was not with them when Jesus came. So the other disciples told him, "We have seen the Lord." But he said to them, "Unless I see in his hands the print of the nails, and place my finger in the mark of the nails, and place my hand in his side, I will not believe." Eight days later, his disciples were again in the house, and Thomas was with them. The doors were shut, but Jesus came and stood among them, and said, "Peace be with you." Then he said to Thomas, "Put your finger here, and see my hands; and put out your hand, and place it in my side; do not be faithless, but believing." Thomas answered him, "My Lord and my God!" Jesus said to him, "Have you believed because you have seen me? Blessed are those who have not seen and yet believe — *John 20:24–29*

Hint: What does this passage tell us about how Jesus was Crucified?

Examining the Shroud Image

The image shows the Shroud of Turin, a rectangular piece of fabric with a brownish-tan background and a faint, mirrored image of a man. The image is oriented vertically. Six numbered callout boxes are positioned around the central image, each with a white pointer directed at a specific feature:

- 1**: Points to the lower left corner of the image.
- 2**: Points to the right side of the image, near the middle.
- 3**: Points to the top left corner of the image.
- 4**: Points to the lower left corner of the image, near the bottom edge.
- 5**: Points to the top right corner of the image.
- 6**: Points to the left side of the image, near the middle.

Examining the Shroud Image

Directions: Take a few moments to observe the image of the man on the shroud. Then, discuss the following questions with a partner or in groups of three or four.

Examine the image and identify and label each of the items as guided by your teacher. Then, answer the questions.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

What is the explanation for each point on the image?

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

Answer Key

Handout A: What Is the Shroud of Turin?

1. The Shroud of Turin is a simple burial cloth containing a perfect photographic negative of a crucified man not produced by any kind of paint, dye, chemical, vapor, or scorching. The recorded reports of the shroud date to 1349 – almost 500 years before the photographic camera was invented.
2. The Shroud reveals a man crowned with thorns, nailed to a cross, pierced by a legionnaire's spear, and flogged by a three-stranded Roman whip made with bone fragments at the end.
3. There are several blood stains on the cloth that congealed before the image was made, yet the location and flow of the blood precisely match where they appear on the image of the body. If the shroud were a forgery, its creator would have had to perfectly place all the blood stains on the cloth before there was an image on which to place them. If not a forgery, this cloth enveloped a real man crucified in the same way as Jesus Christ, including the crown of thorns, the intense flogging, and the piercing of the side.
4. The image is limited to the uppermost surface of the cloth, and it does not penetrate the into the cloth's fibers anywhere. This fact not only means paint and dyes could not have been used to create the image; it shows that the image was not produced by chemicals, vapors, or scorching of any kind. In fact, the most likely remaining explanation is that it was produced by very brief and intense light (not heat!) radiation.
5. The image is a discoloration from dehydration, which implies that it came from very brief and intense light radiation. The image is a perfect photographic negative in which the image intensity is related to the distance of the cloth from the Body. In other words, the image is present on the cloth regardless of whether a particular portion of the cloth touched the body or not.
6. Parts of the image are resolvable into three dimensions. The inside skeletal parts of the hands (on the frontal image) and backbone (on the dorsal, or rear, image) are proportionately related to the surrounding exterior flesh. In other words, the radiation that discolored the cloth came from every point of the body equally, inside and outside. This fact implies that the cloth collapsed into and through the body it wrapped. Somehow the body became physically transparent in such a way that solid objects like cloth could pass through it, a fact for which there is no scientific precedent before or since. This evidence supports the Resurrection.

Handout B: Gospel Accounts of Jesus' Crucifixion

1. Jesus was flogged (or scourged), His head was struck with a reed; He was spit on; the purple robe was stripped off Him (potentially reopening wounds that had clotted).
2. Jesus carried His own Cross and was crucified.
3. After Jesus had died, His side was pierced with a Roman spear and blood and water poured out.
4. Jesus' body was taken down from the Cross, anointed with oils and spices, wrapped in a burial cloth, and placed in a tomb.
5. This passage from after Jesus' Resurrection reveals that Jesus' hands were nailed to the Cross.

Handout C: Examining the Shroud Image

Identifications:

1. Large round wound from piercing on one wrist and both feet. (The other wrist is hidden.)
2. An upward gouge penetrating the side into the rib cage.
3. Small punctures around the forehead and scalp.
4. Many linear gashes throughout the body.
5. Swelling of the face.
6. Streams of blood down both arms.

Explanations:

1. These wounds correspond to the holes made from being nailed to the Cross.
2. This wound corresponds to the wound made from being pierced in the side by a spear.
3. These wounds correspond to marks made from the crown of thorns.
4. These wounds correspond to being beaten, scourged, and being made to carry the Cross.
5. This wound corresponds to being beaten.
6. The blood streams correspond to bleeding from being nailed to the Cross.

Is the Shroud of Turin a Forgery?

SUGGESTED AGE LEVEL: MIDDLE SCHOOL

Overview

The Shroud of Turin is a simple linen burial cloth that bears a photographic negative image of a crucified man – an image that perfectly matches the description of the wounds Christ suffered during His Crucifixion. Recent scientific testing has dated the shroud to roughly the same time as Christ and has placed its origin near the Sea of Galilee. This precious relic is a powerful testimony to our faith in Christ, the historicity of His Resurrection, and His claims to be divine.

Learning Goals

- › The Shroud of Turin contains a miraculous image of a crucified man that all evidence suggests is Jesus Christ.
- › The shroud has undergone numerous scientific investigations over the years that all support the authenticity of the shroud and its image.
- › The Shroud of Turin and the Facecloth of Oviedo share numerous details that likely indicate they both were burial cloths of the same person.
- › The empirical evidence presented by the shroud strongly supports the accuracy of the Gospel accounts of Jesus' Crucifixion and Resurrection.



Connection to the Catechism of the Catholic Church

- › CCC 606–630
- › CCC 638–640
- › CCC 651–655

Key Questions

- › What is the Shroud of Turin?
- › What has the scientific testing of the shroud concluded about its date of origin?
- › What is the Facecloth of Oviedo?
- › How does the evidence support the Gospel accounts of Jesus' Crucifixion and Resurrection?

BIBLICAL TOUCHSTONES

And he bought a linen shroud, and taking him down, wrapped him in the linen shroud, and laid him in a tomb which had been hewn out of the rock; and he rolled a stone against the door of the tomb.

MARK 15:46

Then Simon Peter came, following him, and went into the tomb; he saw the linen cloths lying, and the napkin, which had been on his head, not lying with the linen cloths but rolled up in a place by itself.

JOHN 20:6–7

Lesson Plan

Materials

- › Handout A: Is the Shroud of Turin a Forgery?
- › Handout B: Scientific Testing on the Shroud Videos
- › Video titled “Shroud Carbon Dating Patch” found at **SophiaOnline.org/CarbonDating**
- › Video titled “Shroud Blood” found at **SophiaOnline.org/ShroudBlood**
- › Handout C: Are You Convinced?

Teacher’s Note: This lesson should be taught after the previous lesson on the Shroud of Turin titled **What is the Shroud of Turin?**

Homework

Distribute to your students **Handout A: Is the Shroud of Turin a Forgery?** and have them read the essay and answer the focus and reflection questions.

Warm-Up

- Begin by reviewing and discussing the focus and reflection questions from **Handout A: Is the Shroud of Turin a Forgery?**, which was assigned for homework.
- Next, review with your students that over the centuries, many have believed that the Shroud of Turin is the true burial cloth of Christ. This burial cloth was mentioned in the Gospel accounts of Jesus’ burial and would have been wrapped around His body when He was placed in the tomb. Given the striking image of the crucified man on the shroud and the way the wounds of the man in the image match perfectly with those of Christ from His Passion and Death on the Cross, belief in the authenticity of the shroud has long been compelling. But, throughout the years since the shroud’s first recorded appearance, there have also been those who believe the shroud is an intricate forgery created in the Middle Ages.
- Then, ask your students, if the shroud were actually a forgery, why they think someone might have created a fake relic of Jesus’ Passion, Crucifixion, and Death. *Accept reasoned answers, which may include to convince others of the truth of Jesus’ divinity, especially of His Resurrection; to make money or become famous (never mind that the identity of any potential forger is not known); or even to intentionally deceive others in a malicious way.*
- Next, ask your students how we might go about determining whether the shroud is the true burial cloth of Christ? *Accept reasoned answers. Students should be able to reference the many different kinds of tests that have been performed on the shroud over the centuries, including the anatomical analysis, tests on the blood stains, tests on the cloth of the shroud itself, analysis of the historical record, and so forth. Encourage students to think of other ways or tests that might be performed that might help find an answer.*

- E. Explain to your students that in this lesson they are going to take a closer look at some of the testing that has been performed on the shroud to find an answer to the question of whether it is a forgery or the true burial cloth of Christ.

Activity

- A. Begin by distributing to your students **Handout B: Scientific Testing on the Shroud Videos**.
- B. Next, explain to your students you are going to show them two brief video clips about some of the scientific testing performed on the shroud. The first video is about the 1988 radiocarbon (or Carbon-14) testing performed on the shroud and why these tests were in serious error.
- C. Then, show your students the brief video clip titled “Shroud Carbon Dating Patch” found at **SophiaOnline.org/CarbonDating**. While viewing the video, have your students respond to the corresponding questions. Allow time after showing the video for students to finish answering the questions. You may need to show the video twice.
- D. Next, explain to your students that the second video is about the bloodstains found on the shroud.
- E. Ask them to recall from the previous lesson on the shroud what they learned about the bloodstains on the shroud. Invite students to share what they remember. *There are several blood stains on the cloth that congealed before the image was made, yet the location and flow of the blood precisely match where they appear on the image of the body. If the shroud were a forgery, its creator would have had to perfectly place all the blood stains on the cloth before there was an image on which to place them. Accept other reasoned answers.*
- F. Then, show your students the brief video clip titled “Shroud Blood” found at **SophiaOnline.org/ShroudBlood**. While viewing the video, have your students respond to the corresponding questions. Allow time after showing the video for students to finish answering the questions. You may need to show the video twice.
- G. After viewing the videos and after your students have answered all the questions, review and discuss the correct answers.
- H. Conclude by asking your students, based on the testing discussed in these two video clips, what can be concluded about whether the shroud is a forgery or not. *Accept reasoned answers. The scientific studies addressed in these two videos strongly suggest that shroud is not a forgery. In fact, the results found in these tests suggest that it would have been nearly impossible for a forger to have created the shroud.*

Wrap-Up

- A. Distribute to your students **Handout C: Are You Convinced?** and have them answer the reflection questions based upon what they have learned from this lesson, including the videos, and the previous lesson on the shroud.
- B. When they have finished, call on students to share and discuss their answers.

- C. Help your students come to the conclusion that as convincing as the evidence might be that the Shroud of Turin is the burial cloth of Christ mentioned in the Gospels and evidence of both His divinity and of His Resurrection, ultimately, artifacts such as the shroud should always be considered as aids to our faith and not replacements for it, regardless of the amount of scientific testing and the results of those tests. Remember, when the Risen Jesus appeared to the Apostles in the Upper Room, He invited Thomas the Apostle to touch the wounds in His hands and side, evidence that it was indeed Him. Presented with this undeniable evidence – the Risen Christ standing before him with the wounds of His Crucifixion – Thomas had no choice but to exclaim, “My Lord and my God!” (John 20:28). But then Jesus said to Him, “Have you believed because you have seen me? Blessed are those who have not seen and yet believe” (John 20:29). Jesus made it clear that all the evidence in the world is intended only to increase our faith in Him.

Is the Shroud of Turin a Forgery?

The Shroud of Turin bears the striking image of a crucified man. The image is a perfect photographic negative. The details of the image match the description of Jesus' Crucifixion from the Gospels. From the first recorded reports of the shroud in 1349 to today, many have believed that it is Jesus' burial cloth. Others, however, have suggested it is a forgery created in the Middle Ages. Could they be right?

In recent decades, many scientific tests have been performed on the shroud. The anatomical details of the man in the image have been analyzed, revealing how they parallel Christ's own injuries. How the image was made has been investigated and dating analyses of the shroud has placed its origin at the time of Christ. The evidence provided by these studies and others strongly suggests it really is the burial shroud of Christ.

Let us now consider some of this evidence.

Dating the Shroud

In the last almost half century, different scientific methods have been used to date the shroud. Most of these tests have placed its origin to the time of Christ. The results of one set of tests, however, do not match the rest. Carbon-14 testing done in 1988 by three different labs on a single sample of the shroud placed the sample at 638 years old (to roughly 1350). It is this test that is often pointed to by those who believe the shroud is a forgery.

The sample used in these tests, however, was taken from a previously unknown repair to the shroud. This repair consisted of patches of dyed cotton fibers – not linen like the rest of the

shroud. These patches were most likely dyed to make the fresh white patches blend in with the much older original shroud. Other repairs were known to scientists, particularly ones from damage from a fire in 1532.

Since the sample used in the 1988 testing was not part of the original material, the carbon-dating only tells us when the shroud was patched (apparently around 1350), but nothing about when it was originally made (which was likely much earlier, as we will see). Further, because carbon-dating measures the amount of carbon left in a sample based on a known rate of decline, an event like the 1532 fire can contaminate any sample with added carbon and affect test results. All these factors cast significant doubt on the accuracy of the 1988 Carbon-14 testing.

Newer Scientific Dating Methods

Five newer tests for dating ancient materials have been used on the shroud. These all show a strong likelihood that the shroud originated from the time of Jesus and that the 1988 Carbon-14 testing was in error. The results of the most recent test were published in 2022. It used a highly accurate wide-angle x-ray scattering on a sample of the shroud. The test placed its origin between AD 55–AD 74. This range is very close to the time of Jesus' Crucifixion and Resurrection.

The results of three other tests were reported in 2005. These tests analyzed the rate of decay of organic compounds in the cloth compared to other linens both ancient and modern. These tests revealed a date of origin range for the shroud between 1022 BC–AD 678.

A mechanical test of compressibility and breaking strength was also conducted in 2005. This test compared the physical properties of the fibers of ancient fabrics, such as how much tensile strength individual fibers retain over time. By comparing the shroud fibers with other known ancient fabrics, the date of origin range produced by this test was AD 1–AD 800.

If we average the results of all these tests, the origin of the shroud might be placed at around 33 BC—very close to the time of Jesus. These newer tests show that it is highly probable the shroud's origin must be in the first century AD with a very low margin of error.

Other Indications of the Shroud's Age

Pollen Grains

Pollen grains have been identified in dust samples from the shroud and compared to pollen grains in botanical museums. Most came from Israel, specifically from sediment deposits from 2,000 years ago near the Sea of Galilee. Thirteen samples are only found in that region. Others came from France (where the shroud surfaced in the Middle Ages) and Italy (where the shroud is now). These pollen samples not only strongly place the shroud in the time and region of Christ, but also make the chances of it being a medieval forgery even less likely.

Roman Coins on the Eyes of the Man in the Shroud

Numismatists (coin specialists and collectors) have identified partial imprints of coins on the eyes of the man in the shroud. Overlaid photographs suggest these coins were a specific type of coin minted in Judea in AD 29 by Pontius Pilate. It is hard to conceive of a more pinpointed marker of date and time connecting the shroud to Christ.



Secondo Pia's 1898 negative of the image on the Shroud of Turin. Image courtesy Alamy.

Similarities to the Facecloth of Oviedo

The Shroud of Turin also bears striking resemblance to another cloth known as the Facecloth of Oviedo. The tradition surrounding the Facecloth of Oviedo is that it is the burial cloth mentioned in Scripture that was laid over the face of Christ after His Death (a typical part of Jewish burial custom). Unlike the Shroud of Turin, there is no facial image on the Oviedo cloth. There are, however, blood stains on it, like those of a person brutally beaten and crucified. Many of the same pollens from ancient Israel found on the shroud have also been identified on the Facecloth of Oviedo. Analysis of the bloodstains on the Oviedo cloth and on the shroud have perfectly matched 120 points. This fact strongly indicates that the face each cloth touched had an identical pattern of injuries and blood flow. The Facecloth of Oviedo has a continuous recorded history traceable

to the year 616 compared to the Shroud's documented history from 1349. Therefore, if the two cloths touched the same face, the shroud must be at least as old as the Facecloth of Oviedo – 616 or before.

Drawing a Conclusion

The combined evidence of the pollen samples, the Roman coins, the Facecloth of Oviedo, and the five new dating tests gives strong testimony that the shroud originated in First Century

Palestine around the time of Jesus' Crucifixion. The anatomical perfection of the blood stains on the shroud and the unique features of Jesus' Crucifixion not found in any other crucifixion (the crown of thorns, nail wounds in the hands and feet, and the spear wound in the side), combined with the manner in which the image on the shroud was produced make it unlikely that the shroud is a medieval forgery and highly probable that it is in fact the burial cloth of Jesus Christ.

Focus and Reflection Questions

1. Why are the findings of the 1988 dating test questionable?
2. What newer dating tests have been used on the shroud? What average date do these tests together give for the origin of the shroud?
3. What circumstantial evidence about the date of the shroud is provided by the pollen samples found on the shroud?
4. What is suggested by the partial imprint of coins on the eyes of the man on the shroud?
5. What is the Facecloth of Oviedo? What is the connection between the facecloth and the shroud? Why is this connection significant for dating the Shroud of Turin?

Scientific Testing on the Shroud Videos

Directions: Watch the video clips shown by your teacher. Then, answer the questions.

Shroud Carbon Dating Patch Video

1. What was found in the middle of the samples used in the 1988 radiocarbon dating tests?

2. From tests performed in 1978, of what is the shroud known to be free?

3. What was found on the threads of the 1988 test samples?

4. How were the threads of the 1988 test samples different from the linen fibers?

5. Why might someone have dyed cotton fibers to patch the shroud?

6. What conclusion does the researcher in the video draw about the 1988 test samples?

Shroud Blood Video

1. What did the scientists discover when they analyzed the parts of the shroud that displayed bleeding wounds?

2. According to the video, what would have caused Jesus to bleed when He was Crucified? What would these wounds have produced?

3. What is bilirubin? What was discovered about it in relation to the shroud?

4. What was revealed by UV photography?

5. What conclusion does the research in the video conclude about the bloodstains on the shroud?

Are You Convinced?

Directions: Based on everything you have learned about the Shroud of Turin in this lesson and in the previous lesson, respond to the reflection questions.

1. Does it surprise you that so many tests seem to support the fact that Shroud of Turin is the burial cloth of Christ, including multiple modern dating methods that have placed the origins of the shroud exactly to the time of Christ? Why or why not?

2. Based on the evidence you have seen in this lesson, in the videos, and in the previous lesson, are you convinced that the Shroud of Turin is the true burial cloth of Jesus? Why or why not?

3. Do you think we will ever be able to conclusively determine the truth of the shroud? Why or why not? Does it matter if we do?

4. Do you think scientists and researchers should continue to use the latest scientific tests on the shroud? Why or why not?

Answer Key

Handout A: Is the Shroud of Turin a Forgery?

1. The 1988 test was a Carbon-14 dating test done by three different labs on a single sample. The sample was taken from a previously undiscovered repair patch on the shroud that was cotton dyed to match the original linen. So, the sample gives us the date of the patch, not the shroud. A 1532 fire that damaged the shroud is also significant to remember in terms of carbon dating, as fire contaminates any sample with added carbon, making carbon-dating on the shroud also questionable.
2. Reported in 2022, a highly accurate wide-angle x-ray scattering was used on a sample of the shroud, placing its origin between AD 55–AD 74. Three other tests were reported in 2005 that analyzed the rate of decay of organic compounds in the cloth compared to other linens both ancient and modern. These tests revealed a date of origin range for the shroud between 1022 BC–AD 678. A mechanical test of compressibility and breaking strength was also conducted in 2005. This test compared the physical properties of the fibers of ancient fabrics, such as how much tensile strength individual fibers retain over time. By comparing the shroud fibers with other known ancient fabrics, the date of origin range produced by this test was AD 1–AD 800. The average date places the origin of the shroud around 33 BC — very close to the time of Jesus.
3. Pollen grains have been found on the shroud from the Middle East, France, and Italy (the shroud was in France during the Middle Ages and is in Italy now). But the overwhelming number of grains are from 2,000-year-old sediment deposits from near the Sea of Galilee.
4. The coins placed over the eyes were of a specific coin minted in Judea in AD 29 by Pontius Pilate.
5. The tradition surrounding the Facecloth of Oviedo is that it is the burial cloth mentioned in Scripture that was laid over the face of Christ after His Death. While there is no image present on the facecloth, the bloodstains on the facecloth and the shroud match at 120 points. This fact suggests that the face each cloth touched had an identical pattern of injuries and blood flow. The Facecloth of Oviedo is traceable to at least the year 616, establishing that, if the two cloths touched the same face, the shroud is at least that old.

Handout B: Scientific Testing on the Shroud Videos

Shroud Carbon Dating Patch Video

1. Cotton fibers that did not match the original linen fibers of the shroud.
2. Artificial dyes and pigments.
3. Artificial dyes and pigments — a gum dye mordant. (A mordant is a substance combined with a dye or stain to fix it in the material being colored.)
4. The linen fibers had no dye or pigments, looked slick under a microscope, and the dye used on the cotton fibers had not stuck to the linen fibers.
5. To make the cotton repair invisible to the naked eye (i.e. to make the newer cotton fibers match the same color of the linen fibers next to it).
6. The samples of the shroud used in the 1988 radiocarbon dating tests were taken from the previously unknown dyed cotton repair patch.

Shroud Blood Video

1. The chemical signature of real blood.
2. Jesus was nailed to the Cross. As He bled, red blood cell walls would have ruptured, releasing hemoglobin, the blood component which transfers oxygen around the body.
3. Bilirubin is created when hemoglobin breaks down. It is the substance in blood that causes bruises to turn yellow. The bloodstains on the shroud contain high levels of bilirubin, consistent with the trauma of crucifixion.
4. Serum stains — the liquid medium in which red blood cells are suspended — were revealed by UV photography.
5. No potential medieval artist/forgery could have anticipated the future invention of ultraviolet fluorescence photography and hid serum stains on the shroud for scientists 700 years later to find.

Handout C: Are You Convinced?

1. Accept reasoned answers. This question is meant to help students consider that, while science has its limitations, when it reveals something that is authentically true, there is no conflict with what is true according to Faith.
2. Accept reasoned answers.
3. Accept reasoned answers. The purpose of this question is to get students thinking about the real meaning of the shroud and what it indicates about faith and belief rather than empirical evidence.
4. Accept reasoned answers. This question is meant to help students consider the limits of what scientific testing can tell us about such a religious object.

Scientific Evidence of an Intelligent Creator

Teacher Introduction

There is a common misperception that science and faith are opposed, yet nothing could be further from the truth. Contemporary scientific evidence, as we shall see, favors the existence of God – it does not contradict it. Before considering this evidence, it is important to recognize that in a recent Pew study, just over half of scientists said they believe in God or a universal spirit. There is a vocal minority that promotes atheism, but they do not do so out of rational or scientific

conviction (because it is impossible to disprove God). Instead they do so for the same reasons as the general population – emotion or free choice. The evidence for God from philosophy, science, and the medical study of near-death experiences is enormous. In this chapter we will discuss three principle areas of evidence for an intelligent Creator: The contemporary scientific evidence of the Borde-Vilenkin-Guth Proof, the entropy evidence, and fine-tuning evidence at the Big Bang.

Chapter at a Glance

Enduring Understandings

In this chapter, students will understand that...

- Science and faith have the same goal: to understand the universe as it really is.
- Contemporary science provides many kinds of evidence of the existence of God.
- All coherent, evidence-based theories of our universe require a definite beginning in the past.
- That only nothing can come from nothing is a basic principle of metaphysics.
- Something that must transcend (be beyond) physical reality must cause physical reality to move from nothing to something. We call that something a Creator, or God.
- The structure of the universe that we have, with all its conditions fine-tuned to favor life, is virtually impossible to attribute to random chance.

Essential Questions

- How are the goals of science and faith complementary to one another?
- What kinds of evidence does contemporary science provide as to the existence of God?
- How do the evidence-based theories of the universe all require a definite beginning in the past?
- How does the basic metaphysical principle that only nothing can come from nothing relate to the theories of the universe and the existence of God?
- Why must there be something that transcends physical reality that created the universe?
- How is the universe fine-tuned in such a way that makes life and existence itself possible?

Lesson Plan Chart

ACTIVITY

Handout A: Scientific Evidence of an Intelligent Creator and Focus and Reflection Questions

Handout B: Straight to the Source Primary Source Material

Warm-Up: Handout C: Leap of Faith

Activity #1: Handout D: The Expanding Universe

Activity #2: Handout E: Scientific Evidence of an Intelligent Creator True-False

Activity #3 Handout F: Wonders of Nature: Water

What Your Students Will Learn

Vocabulary

- Agnosticism
- Atheism
- General Theory of Relativity
- Big Bang Theory
- Red Shift
- Cosmic Microwave Background Radiation
- Borde-Vilenkin-Guth Proof
- Entropy
- Second Law of Thermodynamics
- Work
- Metaphysics
- Gravitational Constant
- Strong Nuclear Force
- Ockham's Razor
- Informal Inference

Scripture Encounters

- Luke 1:37
- John 20:29
- Hebrews 11:1

Connections to the Catechism

- CCC 154–159
- CCC 274
- CCC 2293–2294

Straight to the Source

Additional readings from primary sources

- Psalm 19:2–7
- *Fides et Ratio* 106–107, an Encyclical Letter of Pope St. John Paul II, September 14, 1998
- Message of Pope St. John Paul II to Participants in a Study Session of the Pontifical Academy of Sciences, November 29, 1996

Materials

- One rubber band and a ruler per student
- Video clip from Indiana Jones and the Last Crusade found at SophiaOnline.org/LeapOfFaith
- Video titled “Stephen Hawking and the Expanding Universe” found at SophiaOnline.org/HawkingExpandingUniverse
- Video of the cosmic background radiation hiss found at SophiaOnline.org/HearingTheBigBang
- Videos on the qualities of water found at SophiaOnline.org/HowDoesWaterFreeze and SophiaOnline.org/HowDoesWaterMoveUpATree



Team-Teach with a Science Teacher

Invite a chemistry teacher to speak to the class about the states of matter, and specifically how water is unique in that its solid form is less dense than its liquid form. This phenomenon and many others that make water indispensable to life can be explained by the design of its molecules. This quality of water's molecular structure makes it possible for all life to exist on earth.

TEAM-TEACHING OPPORTUNITY

Draw water molecules on the board, such as the example below, highlighting the angle between the oxygen and hydrogen and the partial charges on the atoms, which cause the molecules to be polar. This makes them attracted to each other, and to other charged molecules and surfaces. If the atoms were not charged, if the bond angles did not exist, life would not exist because water would not have its qualities. Everything we know about water can be traced back to this simple design.

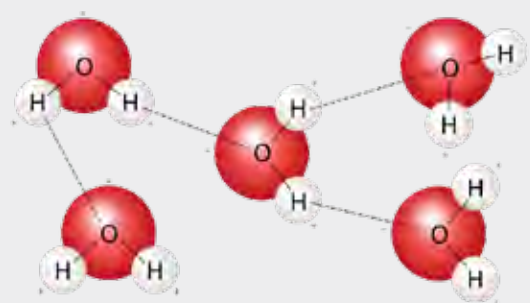


Image courtesy Tara A. Gross, USGS

Focus and Reflection Questions

Homework

Distribute to your students and have them read **Handout A: Scientific Evidence of an Intelligent Creator** and answer the focus and reflection questions. You may also consider having your students read the primary sources on **Handout B: Straight to the Source** and answer the reflection questions.

Answer Key

1 Faith and reason are not opposed to one another. Rather, faith and reason complement each other; faith is based on reason and builds upon it.

2 They deduced that some kind of Creator must exist from the beauty, intricacy, and delicate balance of the universe.

3 The Big Bang theory is based on the observation galaxies are moving through space at an increasing speed. The physicist and Catholic priest Fr. Georges Lemaître developed the Big Bang theory, which suggests that the space between the galaxies was itself stretching and growing. If the universe is truly expanding as a whole, it must have been less expanded in the past. And because there is only a finite distance between galaxies, we know that the universe could not have been expanding forever in the past. The further back into the finite past we go, the more condensed the universe would be, until such a moment when everything in the universe was condensed into one single particle, or “primeval atom,” from which everything in the universe began by being exploded forth – hence the name, “big bang.” This theory is important because it implies that the universe must have a beginning.

4 As distant galaxies move away faster, the wavelengths of light are stretched out (from our perspective on earth), making the light shift towards the red end of the spectrum, which is known as red shift. Cosmic microwave background radiation is a special form of radiation evenly distributed through the entire universe that is a remnant of the Big Bang. Both imply that the universe is expanding after beginning close to 13.8 billion years ago.

Focus and Reflection Questions

- 1 What is the relationship between faith and reason in the Catholic tradition?
- 2 What did scientists like Einstein, Planck, Eddington, and Hoyle think about the existence of God?
- 3 What is the Big Bang theory? Who developed it and what makes it so important?
- 4 What are the red shift and cosmic microwave background radiation? How do they support the Big Bang theory?
- 5 What is the multiverse hypothesis?
- 6 What is the bouncing universe hypothesis?
- 7 What is the higher dimensional space universe hypothesis?
- 8 What is the pre-Big Bang eternally static hypothesis?
- 9 What is the conclusion of the Borde-Vilenkin-Guth Proof? Why is it significant?
- 10 What is entropy? How does it imply that the universe has a beginning?
- 11 Why couldn't the universe have come from nothing? What else is needed?
- 12 What do the gravitational constant and strong nuclear force suggest about the universe?
- 13 What is Ockham's Razor? How does it affect the multiverse hypothesis?

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- 5 The multiverse hypothesis holds that there is a giant inflating universe that can produce a multiplicity of bubble universes indefinitely into the future. Our universe is just one of many such bubble universes.
-
- 6 The bouncing universe hypothesis posits that the universe is in a constant cycle of expanding from a Big Bang, contracting in a big crunch, and then bouncing and re-expanding repeatedly.
-
- 7 The higher dimensional space universe hypothesis is the idea that string theory allows for the possibility of universes to exist in higher dimensional space (consisting of potentially eleven dimensions), permitting unusual complex expanding and bouncing universes.
-
- 8 The pre-Big Bang eternally static hypothesis holds that quantum gravity allows for the possibility of a pre-Big Bang era in which the universe was perfectly stable for a long period of time prior to the Big Bang.
-
- 9 The Borde-Vilenkin-Guth Proof disproves the first three alternative theories of the universe in questions 5–7 by showing that any universe with an expansion rate greater than zero must have a beginning, and so could not exist infinitely into the past. This finding is significant because it means that alternative theories of the universe must also involve a beginning and cannot extend infinitely into the past.
-
- 10 Entropy is the principle that systems always move from order to disorder. To make a system more organized takes something coming in from outside and expending energy. If the universe had existed forever, therefore, it would have lost all its order. Our universe is still ordered, however, and therefore cannot have existed infinitely.
-
- 11 One of the most basic principles of metaphysics states that only nothing can come from nothing. Something must have caused physical reality to move from nothing to something, and that something else must transcend (be beyond) physical reality. We call that something, which is beyond physical reality and caused physical reality to move from nothing to something, a Creator or God.
-
- 12 Both are so delicately fine-tuned to allow the universe and life in it to exist and continue to exist; any tiny difference in these would make the universe uninhabitable, cease to be, or never have come to be at all.
-
- 13 Ockham's Razor is the principle that the best explanation for a phenomenon is the one that requires the fewest assumptions, conditions, and requirements. Since the multiverse hypothesis requires more assumptions than belief in a Creator, Ockham's Razor favors a theist explanation of the universe.
-

Straight to the Source

Primary Source Activity

Answer Key

PSALM 19:2–7

- 1 The heavens and the firmament, and the motion, light, and heat of the sun in relation to earth (acknowledging it as the work of God's hands, and to be good). Accept reasoned answers.
- 2 Accept reasoned answers. It is empirical evidence, gained through observation and documentation of the heavens and the motion of the Sun in relation to earth.
- 3 Accept reasoned answers.

Straight to the Source

ADDITIONAL READINGS FROM PRIMARY SOURCES

Psalms 19:1–6

The heavens are telling the glory of God;
and the firmament proclaims his handiwork.
Day to day pours forth speech,
and night to night declares knowledge.
There is no speech, nor are there words;
their voice is not heard;
yet their voice goes out through all the earth,
and their words to the end of the world.
In them he has set a tent for the sun,
which comes forth like a bridegroom leaving his chamber,
and like a strong man runs its course with joy.
Its rising is from the end of the heavens,
and its circuit to the end of them;
and there is nothing hid from its heat.

- 1 What evidence does the psalmist give for God's glory and handiwork? Do you think this evidence still applies today? Why or why not?
- 2 Would you describe the evidence of God's handiwork given by the Psalmist as scientific evidence? Why or why not?
- 3 Give your own example of how the "heavens declare the glory of God."

Fides et Ratio 106–107, an Encyclical Letter of Pope St. John Paul II, September 14, 1998

106. Finally, I cannot fail to address a word to scientists, whose research offers an ever greater knowledge of the universe as a whole and of the incredibly rich array of its component parts, animate and inanimate, with their complex atomic and molecular structures. So far has science come, especially in this century, that its achievements never cease to amaze us. In expressing my admiration and in offering encouragement to these brave pioneers of scientific research, to whom humanity owes so much of its current development, I would urge them to continue their efforts without ever abandoning the sapiential horizon within which scientific and technological achievements are wedded to the philosophical and ethical values which are the distinctive and indelible mark of the human person. Scientists are well aware that "the search for truth, even when it concerns a finite reality of the world or of man, is never-ending, but always points beyond to something higher than the immediate object of study, to the questions which give access to Mystery."

107. I ask everyone to look more deeply at man, whom Christ has saved in the mystery of his love, and at the human being's unceasing search for truth and meaning. Different philosophical systems have lured people into believing that they are their own absolute master, able to decide their own destiny and future in complete autonomy, trusting only in themselves and their own powers. But this can never be the grandeur of the human being, who can find fulfillment only in choosing to enter the truth, to make a home under the shade of Wisdom and dwell there. Only within this horizon of truth will people understand their freedom in its fullness and their call to know and love God as the supreme realization of their true self.

- 1 What does Pope St. John Paul II say scientific research offers the world?
- 2 What does the pope call on scientists to never abandon in their research? Do you think this is an important reminder for those who pursue scientific research? Why or why not?
- 3 What errors does Pope St. John Paul II say different philosophical systems have lured people into? Where do you see evidence for this today?

Message of Pope St. John Paul II to Participants in a Study Session of the Pontifical Academy of Sciences, November 29, 1996

To the participants in a study session of the Pontifical Academy of Sciences,

It gives me great pleasure once again to greet a gathering of the *Pontifical Academy of Sciences* on the occasion of your current study session. You are aware of my profound esteem for this dedicated body of men and women of science, and of my personal interest in your investigation of questions which are at the forefront of mankind's ever-expanding knowledge of the universe. In saying this, I am expressing the Church's respect for scientific knowledge and her recognition of its immense value to humanity (cf. *Lumen Gentium*, 59).

One of the purposes of your *Academy* is to provide the Holy See and the Church with a picture, as complete and up-to-date as possible, of the latest findings in the various fields of scientific investigation. In this way you contribute to increased understanding between science and faith. Sometimes in the past mutual incomprehension dominated this relationship. Happily, the Church and the scientific community can today look upon each other as partners in the common quest for an ever more perfect understanding of the universe, the theater of man's passage through time towards his transcendent destiny. A fruitful dialogue is taking place between these two realms: the knowledge which depends on the natural power of reason and the knowledge which follows upon the self-revealing intervention of God in human history. The Eternal Father speaks to us in his Word and through the Holy Spirit whom he pours into our hearts (cf. Jn. 1:14; Rom. 5:5). The same God speaks to us in nature, and here too he speaks a language that we can decipher. *Both realms of knowledge are marvelous gifts of the Creator.*

A clear example of a shared interest between science and religion—indeed, of their need of each other—is provided by the subject of your present meeting: *The Emergence of Structure in the Universe at the Level of Galaxies*. With this Conference you are completing a general overview of the physical

FIDES ET RATIO 106–107

- 1 He says it offers “an ever greater knowledge of the universe as a whole and of the incredibly rich array of its component parts, animate and inanimate, with their complex atomic and molecular structures.”
- 2 He calls them not to abandon the “ethical values which are the distinctive and indelible mark of the human person.” Accept reasoned answers. The wondrous results of scientific research and technological developments can often tempt us to believe the lie that faith and science are incompatible, and disorient our sense of morality.
- 3 He says that they have “lured people into believing that they are their own absolute master, able to decide their own destiny and future in complete autonomy, trusting only in themselves and their own powers.” Accept reasoned answers.

MESSAGE OF POPE ST. JOHN PAUL II TO PARTICIPANTS IN A STUDY SESSION OF THE PONTIFICAL ACADEMY OF SCIENCES

- 1 He says they can look upon each other as partners in the common quest for better understanding of the universe, and describes the dialogue between them as fruitful.
- 2 A scheme of the universe which can trace “the whole evolution of the universe from an infinitesimal instant after the starting point of time up to the present, and beyond, into the distant future.”
- 3 Because new questions are arising “which overlap into the spheres of metaphysics and theology.” Thus, through cooperation and collaboration, the dialogue between science and religion might become more firmly grounded in truth.
- 4 Accept reasoned answers.

cosmos. It is extraordinary to think that, with the help of advanced and sophisticated techniques, you “see” as it were not only the vastness of the universe, but also the unimaginable force and dynamism which pervade it. Even more fascinating is the fact that, since the signals from its farthest reaches are transmitted by light which moves at a finite speed, you can “see” back into the remotest past epochs and describe the processes which are going on today. Well-established experimental results enable you to build a general scheme or model, tracing the whole evolution of the universe from an infinitesimal instant after the starting point of time up to the present, and beyond, into the distant future. Certainly, not all is simple and clear in this general scheme, and a number of questions of the utmost importance engage you and your colleagues around the world.

One such question, *the emergence of structure*, constitutes the subject of your present Conference and is of vital interest, especially when we consider that the emergence of structure appears as the pre-condition for the eventual emergence of life, and ultimately of man as the culmination of all that exists around him in the physical cosmos. Men and women of science such as yourselves ponder the vast and pulsating universe, and as you unravel its secrets you realize that at certain points science seems to be reaching a mysterious frontier where new questions are arising which overlap into the spheres of metaphysics and theology. As a result, *the need for dialogue and cooperation between science and faith has become ever more urgent and promising*. It is as if science itself were offering a practical vindication of the openness and confidence shown by the Second Vatican Council when it stated that “investigation carried out in a genuinely scientific manner and in accord with moral norms never truly conflicts with faith” (cf. *Gaudium et Spes*, 38).

I thank you for what you are doing in your respective scientific fields. I hope and pray that he “by whose word the heavens were made” (Ps. 33 [32]:6) will sustain you in your noble endeavors, the results of which make the dialogue between science and religion more concrete and more firmly grounded in the truth. “May you be blessed by the Lord who made heaven and earth!” (Ps. 115 [114]:15).

- 1 How does Pope St. John Paul II describe the relationship and dialogue between the Church and the scientific community at the time he was speaking?
- 2 What “general scheme or model” does Pope St. John Paul II say is possible to build with the help of “advanced and sophisticated” scientific techniques?
- 3 Why in this address does the pope urge for “dialogue and cooperation between science and faith”?
- 4 This address was given to the Pontifical Academy of Sciences in 1996. While technology has changed drastically since this address was given, do you think the pope’s message still applies today? Explain.

Chapter Activities

HANDOUT C

Leap of Faith

Warm-Up

Activity Instructions

- A** Begin by sharing with the class the results of a 2017 study by CARA and St. Mary's Press on religious disaffiliation. Explain that, for decades now, there has been a rise in the number of people who say they do not belong to any religion. Researchers sought to understand why this was happening and surveyed thousands of young people who had left the Catholic Church. When asked their reasons for leaving, one of the most common answers was that the faith "conflicts with my scientific beliefs."
- B** Next, have students discuss the following questions with a partner:
- Why do you think there has been a rise in the number of atheists and those who do not belong to any religion? Is it because science has disproved God, or are there other reasons?
 - Can there be evidence for God's existence? If so, what kind(s)?
 - Do you think the Catholic Faith conflicts with science? Why or why not?
- C** After a few minutes of discussion, call on pairs to share their answers to the first three questions.
- D** Then, explain that some people have a misperception about the role of science and its findings, believing it has disproved the existence of God, or that it can and eventually will solve all our problems. Recall the opening prayer and the last discussion question. Why would we pray that our study of the natural world lead us to what is real and true? What is the goal of natural science? After a few moments of discussion, arrive at the conclusion that the goal of natural science is to understand the universe as it really is.

HANDOUT C

Leap of Faith

Directions: Watch the short video from *Indiana Jones and the Last Crusade* and answer the questions on your own paper.

- 1 What does Indiana Jones say when he first looks at the chasm?
- 2 What effect do you think it has on Indiana Jones to hear that his father is suffering and close to death?
- 3 What else could have happened to Indiana Jones when he took the blind leap of faith into the chasm?
- 4 Could he have done anything before his leap to prevent those things from happening? What does he do when he crosses? Why do you think he does this?
- 5 What reasonable conclusion can be made about the right relationship between faith and reason?
- 6 How would you put the following quote from Pope St. John Paul II's encyclical *Fides et Ratio* in your own words?

Faith and reason are like two wings on which the human spirit rises to the contemplation of truth; and God has placed in the human heart a desire to know the truth—in a word, to know himself—so that, by knowing and loving God, men and women may also come to the fullness of truth about themselves. (*Fides et Ratio*, Greeting)
- 7 Choose one Scripture verse from the selection below that best expresses your response to this short exercise and write a brief reflection explaining why.

"For with God nothing will be impossible."
— Luke 1:37
Jesus said to him, "Have you believed because you have seen me? Blessed are those who have not seen and yet believe."
— John 20:29
Now faith is the assurance of things hoped for, the conviction of things not seen.
— Hebrews 11:1

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- E** Brainstorm with your students some tools that science uses to try to reach this goal of understanding the universe as it really is and keep a list on the board. For example, the scientific method, observation, experimentation, peer review, and so forth.
- F** Next, ask your students how, if at all, the goal of science differs from the goal of theology (faith seeking understanding). Brainstorm with your students some tools used in theology and keep a list on the board. For example, studying Natural and Divine Revelation, Church fathers, philosophy, natural law, and so forth.
- G** Conclude that there can be no conflict between truths about the natural world and religious truth revealed by God. Many kinds of evidence for God's existence come from science (as we will learn about in this chapter) and philosophy (which we will learn about in the next chapter). But the culture, and perhaps the young people in the survey, believe that faith is simply a blind leap.
- H** Then, play the short video from Indiana Jones and the Last Crusade found at SophiaOnline.org/LeapOfFaith. Before doing so, explain, if needed, that Indiana Jones is on a reluctant quest for the Holy Grail which has turned intensely personal as his father lies dying, in need of the Grail's healing power. Indiana Jones is told "only in the leap from the lion's head will he prove his worth."
- I** After showing the video clip, distribute to your students **Handout C: Leap of Faith** and have them work with their same partner to answer the questions.
- J** When they have finished, have pairs of students share their answers.
- K** Conclude that faith is having an active trust in God. The Catholic view of the correct relationship between faith and reason is that faith is built and based on reason, not that they are opposed.

Answer Key

- 1** Impossible.
- 2** Accept reasoned answers, such as it gives him a sense of urgency and motivation to take a leap of faith.
- 3** He could have fallen to his death.
- 4** Accept reasoned answers, but it is unlikely there was anything he could have done. He throws some sand back on the path he took so that he can find the path on his way back.
- 5** Accept reasoned answers. Reasonably, there is no conflict between faith and reason if both come to conclusions that are true.
- 6** Accept reasoned answers.
- 7** Accept reasoned answers.

The Expanding Universe and the Kalam Argument

Activity 1

Activity Instructions

Teacher's Note: Prior to class, gather enough rubber bands and rulers for each student to have one of each.

A Begin by explaining that Fr. Lemaître theorized that galaxies were not moving through fixed empty space, but rather that the space between them was stretching. The farther a galaxy is from our galaxy, the greater will be its recessional velocity (the rate at which an object moves away from the observer). If space itself is stretching (growing like the elastic of a balloon), then the further a galaxy is from us (the observer), the greater its recessional velocity will be. Why? Again, because the space between the galaxies is stretching and growing like a balloon. Thus, the more space there is between our galaxy and another galaxy, the more space there is to stretch and grow, and so we would expect that there would be more growing of space between our galaxy and a far distant galaxy than between our galaxy and a nearer one. This should increase the recessional velocity in proportion to a galaxy's distance from our galaxy.

B Next, distribute to each student a rubber band and a ruler. Have them put the rubber band on top of the ruler (without stretching it) and draw a dot on the rubber band at point zero, another dot at one inch, and yet another dot at two inches.

C Then, demonstrate, using the instructions below, and have each student model your actions:

- Take the rubber band and hold it with your left hand at point zero.
- With your right hand stretch the rubber band so that the dot that was at two inches is now at four inches.
- Explain that, as we can observe, the dot which had been at two inches from origin has now expanded another two inches to the four-inch mark. But notice that the dot which was at the one inch mark has only moved to the two inch mark (an expansion of only one inch).

HANDOUT D

The Expanding Universe

Directions: Read the information below and watch the short videos your teacher presents. Then, answer the questions that follow on your own paper.

Several kinds of evidence confirm the Big Bang. First, in 1929, Edward Hubble observed that the light of more distant galaxies was stretched out more than closer ones, indicating they were moving away from us more quickly. Hubble had a precise equation to calculate this: $v = H_0 D$ (where v is the recessional velocity of a distant galaxy, D is the proper distance of that galaxy from our galaxy, and H is the Hubble constant which transforms proper distance into recessional velocity). Today, the Hubble constant is thought to be 69.32 plus or minus 0.80 (km/s)/Mpc – (kilometer per second) per megaparsec.

Second, in 1965, Arno Penzias and Robert Wilson measured equal amounts of Cosmic Background Radiation (CMB) everywhere in the universe they scanned. They realized it was caused by an incredible burst of energy from a single point at the beginning of time. Since the initial discovery of the CMB, there have been several satellites used to measure it with greater accuracy. Among these are the Cosmic Background Explorer (COBE) from 1988 to 1993, the Wilkinson Microwave Anisotropy Probe (WMAP) from 2001 to 2010, and the Planck Space Observatory (PLANK), from 2009 to 2013.

- 1 Is the red-shifting of galaxies evidence for the Big Bang? Explain why or why not?
- 2 What is the significance of equal amounts of Cosmic Background Radiation?
- 3 The Big Bang is not evidence for the expansion of the universe; it only suggests the universe had a beginning. What question do you think naturally follows from this suggestion?
- 4 What is the goal of science in answering this question?

- Thus, if space as a whole is growing like a balloon (or like our rubber band), the farther away a galaxy is from our galaxy (at point zero on the ruler), the more it expands per unit time. Since recessional velocity is the rate at which an object moves away from the observer, the farther away the galaxy is, the greater its recessional velocity will be – if space between the galaxies is expanding (instead of galaxies moving away from each other in fixed space).

- D** Conclude that the farther a dot is from the starting point, the faster it is moving away in the same amount of time. Explain that the starting point represents the Big Bang and the dots represent galaxies. If the expansion were reversed, all the matter and energy of the universe would converge in one point at a specific moment in the past (about 13.8 billion years ago).
- E** Next, distribute to your students **Handout D: The Expanding Universe** and have them skim the reading.
- F** Then, explain that there are several kinds of evidence that confirm the Big Bang. First, in 1929 Edward Hubble observed that the light of more distant galaxies was stretched out more than closer ones, indicating they were moving away from us more quickly.
- G** Show the four-minute video “Stephen Hawking and the Expanding Universe” found at [SophiaOnline.org/HawkingExpandingUniverse](https://www.sophiaonline.org/HawkingExpandingUniverse). Note that the red-shifting of galaxies is evidence of the universe’s expansion, not its beginning.
- H** Explain that a second type of evidence is known as Cosmic Background Radiation (CMB). CMB is a kind of hiss coming from all directions and is nearly equally distributed throughout the universe, which is what we would expect if it came from a single source, like water rippling in concentric circles when a stone is dropped into a pond.
- I** Play the short video of the cosmic background radiation hiss found at [SophiaOnline.org/HearingTheBigBang](https://www.sophiaonline.org/HearingTheBigBang).
- J** Finally, have students re-read the information, and answer the questions on **Handout D: The Expanding Universe**. Review and discuss their responses when they have finished.

Answer Key

- 1 Accept reasoned answers. The red shifting of galaxies is evidence for the universe’s expansion, not necessarily its beginning. (Though it is suggestive of a beginning point).
- 2 The significance of the hiss coming from all directions is that the energy was nearly equally distributed, which is what we would expect if it came from a single source, like water rippling in concentric circles when a stone is dropped into a pond.
- 3 The next question is: “Where did the matter and energy of the universe (that expanded) come from?”
- 4 Science is committed to seeking the best explanation, including natural ones.

Scientific Evidence of an Intelligent Creator True-False

Activity 2

Activity Instructions

- A** Distribute to your students **Handout E: Scientific Evidence of an Intelligent Creator True-False** and have them complete the activity by marking each statement true or false. Then, if the statement is false, have them correct it by writing on the line what should replace the bolded word/s to make the statement accurate.
- B** When they have finished, review and discuss the correct answers.

Answer Key

- 1 False/not opposed; is built on
- 2 True
- 3 False/because the space between galaxies is stretching/the universe is expanding
- 4 False/supported
- 5 True
- 6 True
- 7 True
- 8 False/not proven
- 9 True
- 10 True

Scientific Evidence of an Intelligent Creator True-False

Directions: Read each statement and write T for true or F for false. If the statement is false, correct it by writing on the line what should replace the **bolded** word/s to make it a true statement.

- _____ 1 The Catholic understanding of faith and reason is that they are **opposed**, and that faith **contradicts** reason. _____
- _____ 2 Einstein **believed** that the universe gives us reason to believe in God. _____
- _____ 3 Fr. Lemaître theorized that galaxies were moving away from one another **in fixed space**. _____
- _____ 4 Evidence discovered since (the red-shifting of galaxies and the Cosmic Microwave Background Radiation) has **disproved** Fr. Lemaître's theory. _____
- _____ 5 The Borde-Vilenkin-Guth Proof **has provided** evidence for a beginning of the universe. _____
- _____ 6 By working backwards from the expansion of the universe, scientists have estimated the age of the universe at about **13 billion years old**. _____
- _____ 7 Entropy means that every physical system – including our universe and even a multiverse (if one existed) – left on its own, will eventually run down until it **runs out of energy and can do nothing**. _____
- _____ 8 Stephen Hawking has **proven** that the universe could create itself because of the Law of Gravity. _____
- _____ 9 The Fine-Tuning of the Universe at precisely the conditions needed for life make it **nearly impossible** for it to have happened by random chance. _____
- _____ 10 The conclusion reached from the scientific evidence (the Big Bang, the BVG Proof, Entropy and the Fine-Tuning of the universe) is that it is **reasonable** to believe that a supernatural being, like God, created it. _____

Wonders of Nature: Water

Activity 3

Activity Instructions

- A** Distribute to your students **Handout F: Wonders of Nature: Water** and have them work in pairs or trios to contemplate the images, using the conversation questions to guide their discussion. If you wish to project the two images, digital files are available at SophiaOnline.org/FrostOnGrass and SophiaOnline.org/FrostOnPond.
- B** After a few moments, call on groups to share about their discussions. Allow the conversation to go in unexpected places, while encouraging students to connect what they deduced about life in the pond to all life on earth: the properties of water are an example of the fine-tuning of the universe they learned about in this chapter.

HANDOUT F

Wonders of Nature: Water



Image courtesy Donna Maus.



Season to Season courtesy of @Martin Wheeler via Twenty20.

Wonders of Nature: Water

Directions: Take a few moments to observe the images on the previous page. Then, discuss the following questions with a partner or in groups of three.

- 1 How many states of matter does water take here on Earth? Look at the first image. How many can you find in it?
- 2 This wintery morning showed thick frost on grass that had been warm the day before. The soil was still warm, but the air was very cold. How can you explain what you are seeing in the photograph?
- 3 What other compounds can you think of that can be found in multiple states of matter in nature?
- 4 Now look at the second image. Here is another familiar sight – this pond froze overnight. Why is the ice on the top of the pond?
- 5 When you are drinking a beverage with ice, where is the ice? Does ice always float? What other examples of it floating can you think of?
- 6 Solids are normally the densest state of matter and sink in their own liquid (e.g. a solid rock sinks in molten rock). What would happen to the living things in and dependent on the pond if water acted like all other substances in nature? Why is water so unique?
- 7 Given the answer to question number 6, what might this suggest about God and His act of creation?

- C** Together, reflect on how water reveals beauty, originality, and simplicity. The qualities of water bear witness to God.
- D** You may wish to show the short videos found at SophiaOnline.org/HowDoesWaterFreeze and SophiaOnline.org/HowDoesWaterMoveUpATree for more fascinating qualities of water, with a chemistry teacher present to answer follow-up questions.

Answer Key

- 1** Three: Solid, liquid, and gas. Students should observe frost on the grass in the pasture (solid), the band of clear air between the grass and the fog (water as a gas, also known as water vapor), and the fog (which contains condensed water vapor as tiny droplets of liquid water).
- 2** The pasture was warm, and therefore water vapor from the plants and the soil was evaporating into the air. This is a familiar sight every Fall. *Note: If you can have a chemistry teacher join for this lesson, they might share that when a cold front moved in, the air that was below the freezing temperature of water met with this water vapor and some of it froze on the plants (frost), while some of it condensed to form the fog. The reason that vapor is still in the air is that water has a very high specific heat, meaning much energy must be taken from the water before it changes temperature. This is due to the hydrogen bonds present between water molecules. Therefore, the water in the soil that was sheltered from the cold wind is still at a temperature above freezing, allowing water vapor to continue to be released into the air.*
- 3** Some students may know that frozen water is less dense than liquid water. Allow students to guess if they do not know. There is no other element or compound that occurs in all three states of matter on earth, at temperatures found in nature that are conducive to life.
- 4** Some students may know that frozen water is less dense than liquid water. Allow students to guess if they do not know.
- 5** At the top of the glass. Ice always floats in water. Other examples may include icebergs or frozen tops of lakes on which to go ice skating.
- 6** All the living things dependent on the pond would die. Water uniquely makes life on earth possible.
- 7** Our faith reveals to us that God was (and still is) intimately involved in His creation. The Book of Genesis details how God personally and actively created by speaking, separating, and placing the various parts of the world, in essence, fine-tuning things to be a home for human beings, the pinnacle of creation. Scientific details, such as the precise nature of water and the molecules that make it up, and its necessity for all life on earth (and in the universe at least as we know it) support this biblical view.

Teacher Notes

HANDOUT A

Scientific Evidence of an Intelligent Creator

Chapter I Overview

There is a common misperception that science and faith are opposed, but nothing could be further from the truth. Contemporary scientific evidence, as we shall see, favors the existence of God; it does not contradict it. The evidence for God from philosophy, science, and the medical study of near-death experiences (some of which were discussed in Unit 1) is enormous. In this chapter, we will learn about three principal areas of physical evidence for an intelligent Creator: the Borde-Vilenkin-Guth Proof, the entropy evidence, and fine-tuning evidence at the Big Bang.

In this chapter you will learn that ...

- Science and faith have the same goal: to understand the universe as it really is.
- Contemporary science provides many kinds of evidence for the existence of God.
- All coherent, evidence-based theories of our universe require a definite beginning in the past.
- That only nothing can come from nothing is a basic principle of metaphysics.
- Something that must transcend (be beyond) physical reality must cause physical reality to move from nothing to something. We call that something a Creator, or God.
- The structure of the universe that we have, with all its conditions fine-tuned to favor life, is virtually impossible to attribute to random chance.



Bible Basics

Jesus said to him, "Have you believed because you have seen me? Blessed are those who have not seen and yet believe."

— *John 20:29*

Now faith is the assurance of things hoped for, the conviction of things not seen.

— *Hebrews 11:1*



Connections to the Catechism

- CCC 154–159
- CCC 274
- CCC 2293–2294

Chapter I

Is Belief in God Old Fashioned?

There is a widespread sense today that people in older times were pretty gullible. They believed in God in the same way they believed in dragons and ghosts—because the world was an overwhelming and mysterious place that they could not explain. It was the so-called Dark Ages! People needed the idea of God as a crutch, so they would not feel so alone. But things are different now. Why would anyone believe that God exists? With the advent of science and the Enlightenment, we have indexed and conquered nature. It seems we no longer need myths and religions to make sense of the world. Do people still believe in God? Sure, but it seems like it is only as a personal and emotional choice that we cannot base on hard evidence. We do not even expect people to provide hard evidence for their beliefs, because many think of faith precisely as the ability to believe something without any evidence. But are all these observations really true?

- ▼ Nicolas Copernicus's theory of heliocentrism (which had been refuted by Aristotle centuries earlier) caused controversy within his lifetime. He died in good standing with the Church.



Astronomer Copernicus, or Conversations with God, by Jan Matejko.

In the Catholic tradition, faith does not work this way. Faith is not opposed to reason; on the contrary, faith builds on reason and is based on reason. Indeed, there are several areas of study that converge to present a rational case for believing in the existence of God. We will look at three of these reasons in this unit: scientific evidence, philosophical evidence, and what we call the transcendental attributes of God. (We discussed a fourth area – personal and medical testimony of near-death experiences – in Chapter 1.)

Contemporary Science

There is a common misperception that science and faith are opposed. Contemporary science, however, provides many kinds of evidence for the existence of God. There is also a wide tradition of openness to faith within the scientific community. According to a 2009 Pew Survey of the American Association for the Advancement of Science, 51 % of scientists declared that they believed in some form of deity (e.g., God), and of the remaining number, more are **agnostic** than **atheist**. Among young scientists, the same Pew Survey found that 66% declared themselves to be believers in God while only 32% indicated they were agnostics or atheists.

Among the theists are several of the great trailblazers of modern science. For example, Albert Einstein, theoretical physicist and Father of the General Theory of Relativity, said, “Certain it is that a conviction, akin to religious feeling, of the rationality and intelligibility of the world lies behind all scientific work of a higher order.... This firm belief, a belief bound up with a deep feeling, in a superior mind that reveals itself in the world of experience, represents my conception of God.” The astrophysicist known for verifying the expansion of the universe, Sir Arthur Eddington, said, “In the mystic sense of the creation around us, in the expression of art, in a yearning towards God, the soul grows upward and finds the fulfillment of something implanted in its nature. The sanction [or drive] ... is within us, a striving born with our consciousness or an Inner Light proceeding from a greater power than ours.” The originator of quantum physics, Max Planck, said, “Religion is the link that binds man to God – resulting from the respectful humility before a supernatural power, to which all human life is subject and which controls our weal and woe.”

These are not the opinions of a few deluded men who were wishfully yearning for a comforting parent. Rather, they are the best intellectual and intuitive conclusions from lives devoted to the highest dimensions of science, mathematics, and logic. If these great scientists believe that

Aa VOCABULARY

Agnosticism: The view that we do not know whether God exists. From the Greek prefix *a-* meaning “without” or “absence of” and *gnosis*, meaning “knowledge.”

Atheism: The belief that God does not exist.

.....

Big Bang Theory: Theory developed by physicist Fr. Georges Lemaître, Ph.D. in 1927, that the universe is expanding outward from a specific point in the past. Galaxies are not moving through a fixed empty space, but rather the space between the galaxies is itself stretching and growing.

the rationality of our universe and the transphysical dimension of our minds warrant belief in God and a soul, then we should want to explore their reasons for believing this.

The Big Bang

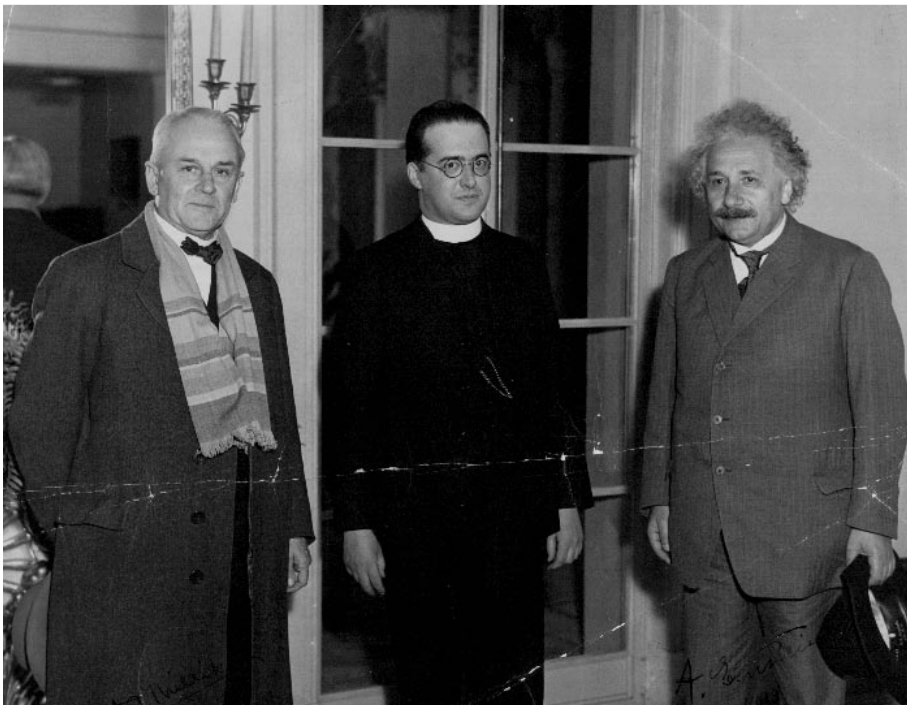
Scientific evidence for God's existence generally relates to God's role as a Creator of the universe, the one who first set everything in motion. For much of human history, however, there was no scientific evidence as to whether the Universe even had a beginning at all.

That all changed in 1927, when Fr. Georges Lemaître, Ph.D., a theoretical physicist and Catholic priest, developed the **Big Bang Theory**. The theory, in part, explained something curious that astronomers had noticed about galaxies moving through space – the further away a galaxy was, the faster it was moving away from us. Lemaître theorized that galaxies were not moving through a fixed empty space, but rather that the space between the galaxies was itself stretching and growing. Think of a polka-dot balloon being inflated – as the balloon grows, the space between the dots grows as well, so the dots become further apart. More distant dots will move further away at a faster rate, just like the distant galaxies were observed to do.

Why does Lemaître's theory have such a consequence? Because, if the universe is truly expanding as a whole, it must have been less expanded in the past. Today, there is only a finite distance between galaxies, and so we know that the universe could not have been expanding forever in the past. The further back into the finite past we go, the more condensed the universe would be, he theorized, until such a moment when everything in the universe was condensed into one single particle, or "primeval atom." Later calculations would work backwards to peg this origin at 13.8 billion years ago (+/- 100 million years). It was from this singular point that everything in the universe began by being exploded forth – hence the name, "big bang."

Scientists had never considered anything like Fr. Lemaître's theory before. Sir Isaac Newton had agreed with St. Thomas Aquinas that the time of the universe could only be known through divine revelation, and so did his followers, right up to the time of Fr. Lemaître. Though Lemaître did not prove that the Big Bang was the beginning of the universe, his theory implied that it could be, and this radically changed the intellectual landscape of the natural sciences.

The theory was so revolutionary that Einstein was skeptical at first. But the equations for the Big Bang would give Einstein the missing puzzle piece about the shape of the universe to complete his



Public domain photo by Caltech employee.

- ◆ Georges Lemaître (center) and Albert Einstein (right) along with Robert A. Millikan (left), at California Institute of Technology, January 1933.

Red Shift: Phenomenon that is observed from our perspective on earth that as stars and galaxies move away faster from us, the light they emit has a longer wavelength and shorter frequency, making the light “shift” towards the red end of the electromagnetic spectrum.

contemporary General Theory of Relativity calculations. Einstein was able to remove a constant he had added to compensate for the universe being eternally static into the past. When Einstein and Lemaître co-presented at a conference in 1933, Einstein reputedly said “This is the most beautiful and satisfactory explanation of creation to which I have ever listened.”

Several forms of evidence would soon support Lemaître’s conclusion. The first confirmation came from astronomer Edwin Hubble at Mt. Wilson Observatory in 1929. The scientific principle he used was called **red shift**: as distant galaxies move away faster, the wavelengths of light are stretched out (from our perspective on earth), making the light shift towards the red end of the spectrum. Other evidence can be found in the cosmic microwave background radiation (the remnant of the Big Bang). A special form of radiation that is evenly distributed through the entire universe and has been dated to be 13.8 billion years old, cosmic microwave background radiation is the aftershock of the birth of the universe.

Does the Big Bang Necessarily Point to a Creator?

If the observable universe began with a Big Bang, does this fact necessarily point to a Creator? Or is there something else outside the observable universe that could have started it? To answer these questions, we

must first consider some certain unconfirmed hypotheses that might allow for the universe to have existed before the Big Bang (meaning that the Big Bang was not the beginning).

1. The multiverse hypothesis holds that there is a giant inflating universe that can produce a multiplicity of bubble universes indefinitely into the future. Our universe is just one of many such bubble universes.
2. The bouncing universe hypothesis posits that the universe is in a constant cycle of expanding from a Big Bang, contracting in a big crunch, and then bouncing and re-expanding repeatedly. The expansion from the Big Bang until today is theorized to be one such cycle – the latest in a long series.
3. The higher dimensional space universe hypothesis is the idea that string theory allows for the possibility of universes to exist in higher dimensional space (consisting of potentially eleven dimensions), permitting unusual complex expanding and bouncing universes.
4. The pre-Big Bang eternally static hypothesis holds that quantum gravity allows for the possibility of a pre-Big Bang era in which the universe was perfectly stable for a long period of time prior to the Big Bang.

▼ The multiverse hypothesis, which holds that our universe is one of many, still requires a beginning.



"Level 2 Multiverse" artistic rendering, by Silver Spoon.

These four theories are possible explanations for a universe that existed before the Big Bang. But for all of them, we can still work backwards to some finite point in the past where the universe(s) began. Each theory can also be shown to be problematic in their explanations.

The **Borde-Vilenkin-Guth Proof**, for example, disproves the first three. Developed by three well-known physicists in 2003, this proof involves a lot of complex steps, but its conclusion is notably simple with its single criterion: any universe with an expansion rate greater than zero must have a beginning, meaning it could not have existed eternally into the past. This one condition (an expansion rate greater than zero) can be applied to all hypothetical multiverses, all hypothetical higher-dimensional string universes, and all bouncing universes, and means that all of them, if true, must have a beginning, no exceptions.

The fourth option, the pre-Big Bang eternally static hypothesis, has been shown to contradict quantum theory by Dr. Alexander Vilenkin, one of developers of the Borde-Vilenkin-Guth proof, making it invalid as well. Currently, then, the best scientific evidence we have shows that physical reality must have had a beginning—regardless of whether it is our universe, a multiverse, a string universe, or a bouncing universe.

Evidence from Entropy

Have you ever noticed that if you do not intentionally take the time and energy to clean up your room, it gets messier? Things left on their own never spontaneously become more organized. This reality is similar to another basic principle that points to a beginning for our universe: entropy. **Entropy** is the principle that systems always move from order to disorder. To make a system more organized takes something coming in from outside and expending energy. The **Second Law of Thermodynamics** says that in isolated systems, movement to disorder never reverses itself. It is for this reason that there is no such thing as a perpetual motion machine—entropy dictates that the machine would eventually stop running and need more fuel to do more **work**.

What does entropy mean for the beginning of our universe? We can break it down into five steps:

1. If our universe had existed for an infinite amount of time, it would have used up all its order necessary to do work.
2. The fact is, however, our universe is doing work—plenty of work—to this very day.
3. Therefore, it could not have lost all its order.

Borde-Vilenkin-Guth Proof:

Proof concluding that any universe with an expansion rate greater than zero must have had a beginning, meaning it could not have existed eternally into the past.

Entropy: Measure of the degree of chaos or disorder in a system. The principle that systems move from order to disorder, and will only become more ordered due to an input of energy into the system, is explained by the Second Law of Thermodynamics.

Second Law of Thermodynamics: Isolated systems always tend to become more disorganized.

Work: The force of energy applied to displace an object. Work transfers energy from one form to another.

Metaphysics: Branch of philosophy that studies the fundamental nature of reality, including space and time; being; necessity, possibility, and change; and identity.

4. Therefore, our universe could not have existed for an infinite amount of time.
5. Since our universe has existed for a finite amount of time, it must have had a beginning.

As with the Borde–Vilenkin–Guth proof, entropy is such a basic, universal law of physics that we can apply it to any physical system, including those hypothesized outside our observable universe. This fact means (as we saw with respect to the Borde–Vilenkin–Guth proof) that those systems – whether they be multiverses, string universes in higher dimensional space, or bouncing universes – must all have a beginning.

Something, Nothing, and Creation

The evidence we have looked at above strongly points to a beginning of physical reality. The beginning of physical reality (in physics) is a point before which physical reality did not exist – it was simply nothing. Therefore, the beginning marks the point at which physical reality came into existence – the point at which it moved from nothing to something.

So, if the universe was not always there, how did it come into existence? How can something come from nothing? The short answer is that only nothing can come from nothing. (This fact is one of the most basic principles of **metaphysics**, dating from the time of the ancient Greeks.) The universe could not have come into existence on its own from nothing.

Think about it. What can nothing do? Obviously, it can only do nothing, because it is nothing. If it is nothing, and can only do nothing, then it cannot move itself from nothing to something. It is stuck in nothingness.

Therefore, something else must cause physical reality to move from nothing to something, and that something else must transcend (be beyond) physical reality. We call that something else, which is beyond physical reality and caused physical reality to move from nothing to something, a Creator or God.

Any scientific attempt to explain how the universe might have brought itself into being from nothing typically winds up sneaking something into the nothing with which it starts. For instance, renowned theoretical physicist Stephen Hawking once posited that the universe could have spontaneously created itself from nothing because of the existence of the law of gravity. But the law of gravity is something. And it is precisely something that is part of the created universe. Clearly,

**The universe
could not have
come into
existence on
its own from
nothing.**



The Astronomer, by Johannes Vermeer.

- ◀ Astronomy is part of the ancient quadrivium (along with arithmetic, geometry and music), which we study in order to understand the universe as it really is.

nothing does not really mean nothing in his scenario. Hawking later admitted this.

Let us now summarize the evidence and conclusions we have examined. There is a high likelihood of a beginning of physical reality (prior to which physical reality was literally nothing), as the evidence of the Big Bang and entropy indicate. From nothing, only nothing comes. Therefore, it is highly likely that the universe came from something which is not physical reality (i.e. beyond physical reality). This is commonly referred to as a transcendent cause of physical reality, a Creator, or simply God.

Even Hawking himself has elsewhere obliquely acknowledged this need for a Creator. As he put it in *A Brief History of Time*: "If we discover a complete theory [of the universe], it would be the ultimate triumph of human reason—for then we should know the mind of God.... Even if there is only one possible unified theory, it is just a set of rules and

- ▶ Stephen Hawking obliquely acknowledged the need for a creator in *A Brief History of Time*.

Gravitational Constant:

A numerical constant that is used to calculate the gravitational attraction between two objects.



Stephen Hawking in 2002. Shutterstock image.

equations. What is it that breathes fire into the equations and makes a universe for them to describe?”

In his last academic paper in 2018, Hawking and his co-author Thomas Hertog showed that an eternally inflating/infinite multiverse hypothesis would be exceedingly unlikely, and that the number of possible universes had to be small. He even concluded (as we have seen the BVG proof shows) that any valid multiverse theory had to be grounded in a past boundary (in other words, a beginning).

Fine-Tuning

Not only does the existence of the universe seem to require a Creator, but the structure of the universe that we have, with all its conditions fine-tuned to favor life, seems impossible to attribute to random chance. Reviewing all these factors that make life possible (many of which are so perfectly calibrated that a shift of less than a millionth of 1% would catastrophically reshape our world) is a fascinating study that spans many diverse scientific fields. We can summarize a few of these factors here.

Let us take one example: the **Gravitational Constant**. This Gravitational Constant determines how strongly physical bodies in the

Ockham's Razor: Principle that we should prefer the explanation with the fewest assumptions, conditions, and requirements, because nature favors elegance over needless complexity.

There are many highly improbable fine-tuning requirements necessary for life.

What about the multiverse hypothesis, where there are trillions and trillions of observable universes? Keep in mind that if the multiverse exists, it would not be observable or verifiable by scientific methods, so it is not a more plausible hypothesis, scientifically speaking, than an intelligent Creator who pre-exists the Big Bang (and who is thus similarly unobservable by scientific methods).

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Informal Inference: A

conclusion that becomes more solid through experimentation, involving the accumulation of different kinds of evidence, from larger sample sizes, that converge on the same result.

Sir Fred Hoyle, one of the greatest nuclear physicists and cosmologists who ever lived, was a former atheist, but when he discovered the fine-tuning requirements for life in our universe, he changed his mind and became a theist with these words: "A common sense interpretation of the facts suggests that a superintellect has monkeyed with physics, as well as with chemistry and biology, and that there are no blind forces worth speaking about in nature. The numbers one calculates from the facts seem to me so overwhelming as to put this conclusion almost beyond question."

To summarize, the scientific evidence for an intelligent Creator falls into three groups: evidence from the expansion of the universe, evidence from entropy, and finally the fine-tuning of the universe at the Big Bang. All these groups of evidence exist independent of each other, but when they are combined, they complement and corroborate each other, while emphasizing different dimensions of the one transcendent intelligent Creator. They form an **informal inference**—a conclusion that becomes more solid through the accumulation of different kinds of evidence that converge on the same result. Here, scientific evidence currently shows the high likelihood of a superintelligent, transcendent, cause of the whole of physical reality (our universe and any other hypothetical multiverse, bouncing universe, or string universe). We call this supernatural cause of physical reality a Creator, or God. In the next chapter we will turn to another complementary field of evidence—the philosophical evidence for God's existence.

- ▶ The Helix Nebula, sometimes called the "Eye of God," spans a distance of 2.5 light years. The closest example of a planetary nebula created at the end of the life of a Sun-like star, it is 625 light years away from Earth.



Helix Nebula, NGC 7293. Hubble telescope image courtesy NASA.

Focus and Reflection Questions

- 1 What is the relationship between faith and reason in the Catholic tradition?
- 2 What did scientists like Einstein, Planck, Eddington, and Hoyle think about the existence of God?
- 3 What is the Big Bang theory? Who developed it and what makes it so important?
- 4 What are the red shift and cosmic microwave background radiation? How do they support the Big Bang theory?
- 5 What is the multiverse hypothesis?
- 6 What is the bouncing universe hypothesis?
- 7 What is the higher dimensional space universe hypothesis?
- 8 What is the pre-Big Bang eternally static hypothesis?
- 9 What is the conclusion of the Borde-Vilenkin-Guth Proof? Why is it significant?
- 10 What is entropy? How does it imply that the universe has a beginning?
- 11 Why couldn't the universe have come from nothing? What else is needed?
- 12 What do the gravitational constant and strong nuclear force suggest about the universe?
- 13 What is Ockham's Razor? How does it affect the multiverse hypothesis?

Straight to the Source

ADDITIONAL READINGS FROM PRIMARY SOURCES

Psalm 19:1–6

The heavens are telling the glory of God;
and the firmament proclaims his handiwork.
Day to day pours forth speech,
and night to night declares knowledge.
There is no speech, nor are there words;
their voice is not heard;
yet their voice goes out through all the earth,
and their words to the end of the world.
In them he has set a tent for the sun,
which comes forth like a bridegroom leaving his chamber,
and like a strong man runs its course with joy.
Its rising is from the end of the heavens,
and its circuit to the end of them;
and there is nothing hid from its heat.

- 1 What evidence does the psalmist give for God's glory and handiwork? Do you think this evidence still applies today? Why or why not?
- 2 Would you describe the evidence of God's handiwork given by the Psalmist as scientific evidence? Why or why not?
- 3 Give your own example of how the "heavens declare the glory of God."

Fides et Ratio 106–107, an Encyclical Letter of Pope St. John Paul II, September 14, 1998

106. Finally, I cannot fail to address a word to scientists, whose research offers an ever greater knowledge of the universe as a whole and of the incredibly rich array of its component parts, animate and inanimate, with their complex atomic and molecular structures. So far has science come, especially in this century, that its achievements never cease to amaze us. In expressing my admiration and in offering encouragement to these brave pioneers of scientific research, to whom humanity owes so much of its current development, I would urge them to continue their efforts without ever abandoning the sapiential horizon within which scientific and technological achievements are wedded to the philosophical and ethical values which are the distinctive and indelible mark of the human person. Scientists are well aware that "the search for truth, even when it concerns a finite reality of the world or of man, is never-ending, but always points beyond to something higher than the immediate object of study, to the questions which give access to Mystery."

107. I ask everyone to look more deeply at man, whom Christ has saved in the mystery of his love, and at the human being's unceasing search for truth and meaning. Different philosophical systems have lured people into believing that they are their own absolute master, able to decide their own destiny and future in complete autonomy, trusting only in themselves and their own powers. But this can never be the grandeur of the human being, who can find fulfillment only in choosing to enter the truth, to make a home under the shade of Wisdom and dwell there. Only within this horizon of truth will people understand their freedom in its fullness and their call to know and love God as the supreme realization of their true self.

- 1 What does Pope St. John Paul II say scientific research offers the world?
- 2 What does the pope call on scientists to never abandon in their research? Do you think this is an important reminder for those who pursue scientific research? Why or why not?
- 3 What errors does Pope St. John Paul II say different philosophical systems have lured people into? Where do you see evidence for this today?

Message of Pope St. John Paul II to Participants in a Study Session of the Pontifical Academy of Sciences, November 29, 1996

To the participants in a study session of the Pontifical Academy of Sciences,

It gives me great pleasure once again to greet a gathering of the *Pontifical Academy of Sciences* on the occasion of your current study session. You are aware of my profound esteem for this dedicated body of men and women of science, and of my personal interest in your investigation of questions which are at the forefront of mankind's ever-expanding knowledge of the universe. In saying this, I am expressing the Church's respect for scientific knowledge and her recognition of its immense value to humanity (cf. *Lumen Gentium*, 59).

One of the purposes of your *Academy* is to provide the Holy See and the Church with a picture, as complete and up-to-date as possible, of the latest findings in the various fields of scientific investigation. In this way you contribute to increased understanding between science and faith. Sometimes in the past mutual incomprehension dominated this relationship. Happily, the Church and the scientific community can today look upon each other as partners in the common quest for an ever more perfect understanding of the universe, the theater of man's passage through time towards his transcendent destiny. A fruitful dialogue is taking place between these two realms: the knowledge which depends on the natural power of reason and the knowledge which follows upon the self-revealing intervention of God in human history. The Eternal Father speaks to us in his Word and through the Holy Spirit whom he pours into our hearts (cf. Jn. 1:14; Rom. 5:5). The same God speaks to us in nature, and here too he speaks a language that we can decipher. *Both realms of knowledge are marvelous gifts of the Creator.*

A clear example of a shared interest between science and religion—indeed, of their need of each other—is provided by the subject of your present meeting: *The Emergence of Structure in the Universe at the Level of Galaxies*. With this Conference you are completing a general overview of the physical

cosmos. It is extraordinary to think that, with the help of advanced and sophisticated techniques, you “see” as it were not only the vastness of the universe, but also the unimaginable force and dynamism which pervade it. Even more fascinating is the fact that, since the signals from its farthest reaches are transmitted by light which moves at a finite speed, you can “see” back into the remotest past epochs and describe the processes which are going on today. Well-established experimental results enable you to build a general scheme or model, tracing the whole evolution of the universe from an infinitesimal instant after the starting point of time up to the present, and beyond, into the distant future. Certainly, not all is simple and clear in this general scheme, and a number of questions of the utmost importance engage you and your colleagues around the world.

One such question, *the emergence of structure*, constitutes the subject of your present Conference and is of vital interest, especially when we consider that the emergence of structure appears as the pre-condition for the eventual emergence of life, and ultimately of man as the culmination of all that exists around him in the physical cosmos. Men and women of science such as yourselves ponder the vast and pulsating universe, and as you unravel its secrets you realize that at certain points science seems to be reaching a mysterious frontier where new questions are arising which overlap into the spheres of metaphysics and theology. As a result, *the need for dialogue and cooperation between science and faith has become ever more urgent and promising*. It is as if science itself were offering a practical vindication of the openness and confidence shown by the Second Vatican Council when it stated that “investigation carried out in a genuinely scientific manner and in accord with moral norms never truly conflicts with faith” (cf. *Gaudium et Spes*, 38).

I thank you for what you are doing in your respective scientific fields. I hope and pray that he “by whose word the heavens were made” (Ps. 33 [32]:6) will sustain you in your noble endeavors, the results of which make the dialogue between science and religion more concrete and more firmly grounded in the truth. “May you be blessed by the Lord who made heaven and earth!” (Ps. 115 [114]:15).

- 1 How does Pope St. John Paul II describe the relationship and dialogue between the Church and the scientific community at the time he was speaking?
- 2 What “general scheme or model” does Pope St. John Paul II say is possible to build with the help of “advanced and sophisticated” scientific techniques?
- 3 Why in this address does the pope urge for “dialogue and cooperation between science and faith”?
- 4 This address was given to the Pontifical Academy of Sciences in 1996. While technology has changed drastically since this address was given, do you think the pope’s message still applies today? Explain.

Leap of Faith

Directions: Watch the short video from *Indiana Jones and the Last Crusade* and answer the questions on your own paper.

- 1 What does Indiana Jones say when he first looks at the chasm?
- 2 What effect do you think it has on Indiana Jones to hear that his father is suffering and close to death?
- 3 What else could have happened to Indiana Jones when he took the blind leap of faith into the chasm?
- 4 Could he have done anything before his leap to prevent those things from happening? What does he do when he crosses? Why do you think he does this?
- 5 What reasonable conclusion can be made about the right relationship between faith and reason?
- 6 How would you put the following quote from Pope St. John Paul II's encyclical *Fides et Ratio* in your own words?

Faith and reason are like two wings on which the human spirit rises to the contemplation of truth; and God has placed in the human heart a desire to know the truth—in a word, to know himself—so that, by knowing and loving God, men and women may also come to the fullness of truth about themselves. (*Fides et Ratio*, Greeting)

- 7 Choose one Scripture verse from the selection below that best expresses your response to this short exercise and write a brief reflection explaining why.

"For with God nothing will be impossible."

— *Luke 1:37*

Jesus said to him, "Have you believed because you have seen me? Blessed are those who have not seen and yet believe."

— *John 20:29*

Now faith is the assurance of things hoped for, the conviction of things not seen.

— *Hebrews 11:1*

The Expanding Universe

Directions: Read the information below and watch the short videos your teacher presents. Then, answer the questions that follow on your own paper.

Several kinds of evidence confirm the Big Bang. First, in 1929, Edward Hubble observed that the light of more distant galaxies was stretched out more than closer ones, indicating they were moving away from us more quickly. Hubble had a precise equation to calculate this: $v = H_0 D$ (where v is the recessional velocity of a distant galaxy, D is the proper distance of that galaxy from our galaxy, and H is the Hubble constant which transforms proper distance into recessional velocity). Today, the Hubble constant is thought to be 69.32 plus or minus 0.80 (km/s)/Mpc – (kilometer per second) per megaparsec.

Second, in 1965, Arno Penzias and Robert Wilson measured equal amounts of Cosmic Background Radiation (CMB) everywhere in the universe they scanned. They realized it was caused by an incredible burst of energy from a single point at the beginning of time. Since the initial discovery of the CMB, there have been several satellites used to measure it with greater accuracy. Among these are the Cosmic Background Explorer (COBE) from 1988 to 1993, the Wilkinson Microwave Anisotropy Probe (WMAP) from 2001 to 2010, and the Planck Space Observatory (PLANK), from 2009 to 2013.

- 1 Is the red-shifting of galaxies evidence for the Big Bang? Explain why or why not?
- 2 What is the significance of equal amounts of Cosmic Background Radiation?
- 3 The Big Bang is not evidence for the expansion of the universe; it only suggests the universe had a beginning. What question do you think naturally follows from this suggestion?
- 4 What is the goal of science in answering this question?

Scientific Evidence of an Intelligent Creator True-False

Directions: Read each statement and write T for true or F for false. If the statement is false, correct it by writing on the line what should replace the **bolded** word/s to make it a true statement.

- _____ 1 The Catholic understanding of faith and reason is that they are **opposed**, and that faith **contradicts** reason. _____
- _____ 2 Einstein **believed** that the universe gives us reason to believe in God. _____
- _____ 3 Fr. Lemaître theorized that galaxies were moving away from one another **in fixed space**. _____
- _____ 4 Evidence discovered since (the red-shifting of galaxies and the Cosmic Microwave Background Radiation) has **disproved** Fr. Lemaître's theory. _____
- _____ 5 The Borde-Vilenkin-Guth Proof **has provided** evidence for a beginning of the universe. _____
- _____ 6 By working backwards from the expansion of the universe, scientists have estimated the age of the universe at about **13 billion years old**. _____
- _____ 7 Entropy means that every physical system – including our universe and even a multiverse (if one existed) – left on its own, will eventually run down until it **runs out of energy and can do nothing**. _____
- _____ 8 Stephen Hawking has **proven** that the universe could create itself because of the Law of Gravity. _____
- _____ 9 The Fine-Tuning of the Universe at precisely the conditions needed for life make it **nearly impossible** for it to have happened by random chance. _____
- _____ 10 The conclusion reached from the scientific evidence (the Big Bang, the BVG Proof, Entropy and the Fine-Tuning of the universe) is that it is **reasonable** to believe that a supernatural being, like God, created it. _____

Wonders of Nature: Water



Image courtesy Donna Maus.



Season to Season courtesy of @Martin Wheeler via Twenty20.

Wonders of Nature: Water

Directions: Take a few moments to observe the images on the previous page. Then, discuss the following questions with a partner or in groups of three.

- 1 How many states of matter does water take here on Earth? Look at the first image. How many can you find in it?
- 2 This wintery morning showed thick frost on grass that had been warm the day before. The soil was still warm, but the air was very cold. How can you explain what you are seeing in the photograph?
- 3 What other compounds can you think of that can be found in multiple states of matter in nature?
- 4 Now look at the second image. Here is another familiar sight – this pond froze overnight. Why is the ice on the top of the pond?
- 5 When you are drinking a beverage with ice, where is the ice? Does ice always float? What other examples of it floating can you think of?
- 6 Solids are normally the densest state of matter and sink in their own liquid (e.g. a solid rock sinks in molten rock). What would happen to the living things in and dependent on the pond if water acted like all other substances in nature? Why is water so unique?
- 7 Given the answer to question number 6, what might this suggest about God and His act of creation?

The background of the page is a reproduction of Raphael's fresco 'The School of Athens'. It depicts various ancient Greek philosophers in a grand architectural setting. In the center, Plato (an older man with a long white beard, pointing his right index finger towards the sky) and Aristotle (a younger man with a brown beard, holding a book in his left hand and gesturing with his right palm facing down) are the most prominent figures. They are surrounded by other philosophers, some standing and some sitting, engaged in discussion and study. The scene is set within a large, arched doorway, with a bright, cloudy sky visible in the background.

Philosophical Proofs of an Intelligent Creator

Teacher Introduction

The term *philosophy* comes from Greek and means “love of wisdom.” Your students, however, may use it casually to mean “worldview.” In this course we are using the term in its actual meaning: a reasoned study of the truth of things. Truth is the conforming of the mind to reality – when what exists and what we think exists are the same. Philosophers and scientists alike seek to understand the universe as it really is, or, in other words, to know the truth about the universe.

The idea of seeking truth can be difficult to teach about in our increasingly secular and post-modern world. Nowadays, the prevailing understanding of “truth” is that it is merely something we feel, and, through those feelings, create or determine for ourselves. The careful study of St. Thomas’s proof may help students begin to understand that truth exists, and can be known. By beginning with things we can observe, and using reason and deduction from there, we can see that it is not only reasonable to believe God exists, but that He necessarily must exist.

Chapter at a Glance

Enduring Understandings

In this chapter, students will understand that...

- Philosophy is the love of wisdom and can be used to come to reasonable knowledge of God.
- St. Thomas Aquinas demonstrated by way of five proofs for God's existence that there must be one uncaused, unrestricted being who caused everything else.
- Contemporary philosopher Bernard Lonergan has developed a new proof for God's existence that focuses on the intelligibility of reality: God is the complete set of correct answers to the complete set of questions.
- Philosophical proofs for God can tell us what God is – the Creator, the unique uncaused reality existing through itself, unrestricted in intelligibility and in intelligence – but they are limited in what they can tell us about who God is.

Essential Questions

- How can philosophy be used to come to knowledge of God?
- What are St. Thomas Aquinas' five proofs for God's existence?
- How does Bernard Lonergan prove that God is the complete set of answers to the complete set of questions?
- How can we come to know who God is?

Lesson Plan

ACTIVITY

Handout A: Philosophical Proofs of an Intelligent Creator and Focus and Reflection Questions

Handout B: Straight to the Source Primary Source Material

Warm-up: No Restrictions (Teacher-guided activity)

Activity 1: Proofs for God's Existence (Teacher-guided activity)

Activity 2: Handout C: The Kalam Cosmological Argument

Activity 3: Handout D: Philosophical Proofs of an Intelligent Creator True-False

What Your Students Will Learn

Vocabulary

- Philosophy
- Five Ways
- Potency
- Act
- First Mover
- Efficient Cause
- Teleology

Scripture Encounters

- Proverbs 9:10
- Romans 1:19–20

Connections to the Catechism

- CCC 31–53
- CCC 154–159
- CCC 237
- CCC 274
- CCC 286

Straight to the Source

Additional readings from primary sources

- *Fides et Ratio* 36, an Encyclical Letter of Pope St. John Paul II, September 14, 1998
- *Fides et Ratio* 43–44, an Encyclical Letter of Pope St. John Paul II, September 14, 1998

Materials

- Several pairs of identical small items, such as books, candy bars, toys, or playing cards.
- Five Ways cards, available at SophiaOnline.org/FiveWaysCards
- Video titled “The Kalam Cosmological Argument” found at SophiaOnline.org/KalamCosmologicalArgument

Focus and Reflection Questions

Homework

Distribute to your students and have them read **Handout A: Philosophical Proofs of an Intelligent Creator** and answer the focus and reflection questions. You may also consider having your students read the primary sources on **Handout B: Straight to the Source** and answer the reflection questions.

Answer Key

- 1 The term *philosophy* comes from the Greek word *philosophia*, which means “love of wisdom.” Philosophy is a reasoned study of the truth of things.
- 2 God’s existence: there must be one uncaused being which created everything else – and this reality is referred to as God. He developed “Five Ways,” or five proofs for God’s existence.
- 3 Philosophical proofs depend upon logic as well as formulated premises, which are readily verifiable or proven by a prior argument. For a philosophical proof to be valid (true), the logic must be sound, and the premises of the argument must be verifiable in some way. The most basic structure of a philosophical proof has two premises and a conclusion.
- 4 By “motion,” Aquinas means not just movement but change. His initial observation is that in there is change all around us in the world.

Focus and Reflection Questions

- 1 What does the word *philosophy* mean?
- 2 What did St. Thomas Aquinas famously use philosophy to prove?
- 3 What do philosophical proofs depend on? What is needed for a proof to be true? What is the most basic structure of a philosophical proof?
- 4 In Aquinas’ First Way, what does he mean by “motion”? What is his initial observation?
- 5 How does Aquinas use the concepts of potency and act to prove that God must exist?
- 6 What is an efficient cause in Aquinas’ Second Way? How does he prove God’s existence using efficient causality?
- 7 According to Aquinas’ Third Way, why is God the one necessary being in all existence?
- 8 In Aquinas’ Fifth Way, what is required by the goal-oriented nature of all animate creatures?
- 9 Why does Lonergan argue that there must be an uncaused reality that we call God?
- 10 According to Lonergan, why can’t any material thing or any material realities provide a complete set of answers to a complete set of questions?
- 11 What can we conclude by combining Aquinas’ Third Way with Lonergan’s proof?
- 12 What do the proofs for God studied in this chapter ultimately tell us about God? What are they unable to tell us?
- 13 While it is unlikely that any one single philosophical proof will be wholly convincing to a non-believer, what can they provide when taken together?

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- 5 Before a change, an object is said to be in potency to its changed state. After the change, the object is said to be in act (actualized) to this changed state. So, we might describe change as a transition from potency to act. Something possible (in potential) can only come to be by something actual. An object which is in potency to a new changed state must be moved (acted upon) by something else to transition from potency to act (its new changed state), because it cannot move itself to what it does not have. This would be the case for all other movers that need to be moved from potency to act – all of them would need movers. This cycle cannot go on back to infinity. If there were no first cause that put everything in motion, nothing whatsoever would move. There would be no motion (change) in anything, so there must be an unmoved mover that set everything else into motion. This First Mover is God.
-
- 6 An efficient cause is an agent that causes other things to happen in some way. Efficient causes cannot go on infinitely into the past. There must be a first efficient cause – an eternal first cause – that did not come to be by anything else, but just is. God is the name we give to that first efficient cause.
-
- 7 If everything in reality were caused by something else, then the whole of reality itself would have to be caused by something else. There is, however, by definition, nothing else outside the whole of reality. Thus, there must be a being in the whole of reality that does not need a cause of its existence. If there were no uncaused being in the whole of reality then the whole of reality would not exist, which is plainly false. Therefore, there must be a being which is uncaused – which exists through itself because it is existence itself – a necessary being. This necessary being (existence itself) is something that has always existed with no beginning or end and did not receive its existence from something else – something that never came to be because it always is. Without such a being, there would be nothing at all. We call this necessary being God.
-
- 8 The goal-oriented nature of all animate creatures requires an agent that moves all things intelligently to their proper end. Aquinas calls this movement of all things to their purpose and perfection the Eternal Law [the wisdom] of God.
-
- 9 There must be some cause to explain why one possibility is real while others are not. If those other realities do not exist through themselves, then the answer to the question about why they exist would lie in still other realities beyond themselves. This chain of questions and answers will not come to a complete answer until we reach an answer that explains itself completely – that is, an uncaused reality, which we call God.
-
- 10 All material things and realities have limits in space, time, dimension, power, qualities, spatial limits, temporal limits, limits to power and qualities, and so forth. Such things and realities can only answer a very small number of questions. They cannot contain the complete set of correct answers to the complete set of questions.
-
- 11 There must exist one uncaused, unrestricted act of consciousness or thinking which is the ultimate cause of the existence and intelligibility of everything else that exists, which we call God.
-
- 12 They tell us what God is – the Creator, the unique uncaused reality existing through itself, unrestricted in intelligibility and in intelligence – but they are limited in what they can tell us about who God is.
-
- 13 They provide an intriguing preponderance of evidence for God’s existence difficult to deny.
-

Straight to the Source

Primary Source Activity

Answer Key

FIDES ET RATIO 36

- 1 Accept reasoned answers. Classical philosophy sought a rational foundation for religion.
- 2 Poetry.
- 3 Because of the mutual practice of rational analysis, the mutual desire to have a rational foundation for belief, and the mutual acceptance of certain universal principles.

FIDES ET RATIO 43–44

- 1 He argued that both the light of reason and the light of faith come from God, therefore, there could be no contradiction between the two.
- 2 Accept reasoned answers. Showing the reasonableness of faith makes faith easier and reasonable for others to adopt on their own. In our human experience, we tend to most often act reasonably, and so, if Christianity is reasonable, it makes sense to adopt and live the Christian Faith, which is thus not unreasonable or against how we should live and act.
- 3 Accept reasoned answers. The Holy Spirit helps turn knowledge into wisdom. Without the aid of the Holy Spirit, knowledge remains only knowledge. But, with the help of the Holy Spirit, it can mature into and enhance our Faith, the proper end of knowledge.

Straight to the Source

ADDITIONAL READINGS FROM PRIMARY SOURCES

Fides et Ratio 36, an Encyclical Letter of Pope St. John Paul II, September 14, 1998

36. One of the major concerns of classical philosophy was to purify human notions of God of mythological elements. We know that Greek religion, like most cosmic religions, was polytheistic, even to the point of divinizing natural things and phenomena. Human attempts to understand the origin of the gods and hence the origin of the universe find their earliest expression in poetry; and the theogonies remain the first evidence of this human search. But it was the task of the fathers of philosophy to bring to light the link between reason and religion. As they broadened their view to include universal principles, they no longer rested content with the ancient myths, but wanted to provide a rational foundation for their belief in the divinity. This opened a path which took its rise from ancient traditions but allowed a development satisfying the demands of universal reason. This development sought to acquire a critical awareness of what they believed in, and the concept of divinity was the prime beneficiary of this. Superstitions were recognized for what they were and religion was, at least in part, purified by rational analysis. It was on this basis that the Fathers of the Church entered into fruitful dialogue with ancient philosophy, which offered new ways of proclaiming and understanding the God of Jesus Christ.

- 1 What was a major concern of classical philosophy? Explain.
- 2 What does Pope St. John Paul II say was the earliest expression of the human search for the divine?
- 3 How was it that the Fathers of the Church could enter into fruitful dialogue with ancient philosophy?

Fides et Ratio 43–44, an Encyclical Letter of Pope St. John Paul II, September 14, 1998

43. A quite special place in this long development belongs to Saint Thomas, not only because of what he taught but also because of the dialogue which he undertook with the Arab and Jewish thought of his time. In an age when Christian thinkers were rediscovering the treasures of ancient philosophy, and more particularly of Aristotle, Thomas had the great merit of giving pride of place to the harmony which exists between faith and reason. Both the light of reason and the light of faith come from God, he argued; hence there can be no contradiction between them.

More radically, Thomas recognized that nature, philosophy's proper concern, could contribute to the understanding of divine Revelation. Faith therefore has no fear of reason, but seeks it out and has trust in it. Just as grace builds on nature and brings it to fulfilment, so faith builds upon and perfects reason. Illumined by faith, reason is set free from the fragility and limitations deriving from the disobedience of sin and finds the strength required to rise to the knowledge of the Triune God. Although he made much of the supernatural character of faith, the Angelic Doctor did not overlook the importance of its reasonableness; indeed he was able to plumb the depths and explain the meaning of this reasonableness. Faith is in a sense an "exercise of thought"; and human reason is neither annulled nor debased in assenting to the contents of faith, which are in any case attained by way of free and informed choice.

This is why the Church has been justified in consistently proposing Saint Thomas as a master of thought and a model of the right way to do theology. In this connection, I would recall what my Predecessor, the Servant of God Paul VI, wrote on the occasion of the seventh centenary of the death of the Angelic Doctor: "Without doubt, Thomas possessed supremely the courage of the truth, a freedom of spirit in confronting new problems, the intellectual honesty of those who allow Christianity to be contaminated neither by secular philosophy nor by a prejudiced rejection of it. He passed therefore into the history of Christian thought as a pioneer of the new path of philosophy and universal culture. The key point and almost the kernel of the solution which, with all the brilliance of his prophetic intuition, he gave to the new encounter of faith and reason was a reconciliation between the secularity of the world and the radicality of the Gospel, thus avoiding the unnatural tendency to negate the world and its values while at the same time keeping faith with the supreme and inexorable demands of the supernatural order".

44. Another of the great insights of Saint Thomas was his perception of the role of the Holy Spirit in the process by which knowledge matures into wisdom. From the first pages of his *Summa Theologiae*, Aquinas was keen to show the primacy of the wisdom which is the gift of the Holy Spirit and which opens the way to a knowledge of divine realities. His theology allows us to understand what is distinctive of wisdom in its close link with faith and knowledge of the divine. This wisdom comes to know by way of connaturality; it presupposes faith and eventually formulates its right judgement on the basis of the truth of faith itself: "The wisdom named among the gifts of the Holy Spirit is distinct from the wisdom found among the intellectual virtues. This second wisdom is acquired through study, but the first 'comes from on high', as Saint James puts it. This also distinguishes it from faith, since faith accepts divine truth as it is. But the gift of wisdom enables judgement according to divine truth".

Yet the priority accorded this wisdom does not lead the Angelic Doctor to overlook the presence of two other complementary forms of wisdom—philosophical wisdom, which is based upon the capacity of the intellect, for all its natural limitations, to explore reality, and theological wisdom, which is based upon Revelation and which explores the contents of faith, entering the very mystery of God.

Profoundly convinced that "whatever its source, truth is of the Holy Spirit" (*omne verum a quocumque dicatur a Spiritu Sancto est*) Saint Thomas was impartial in his love of truth. He sought truth wherever it might be found and gave consummate demonstration of its universality. In him, the Church's Magisterium has seen and recognized the passion for truth; and, precisely because it stays consistently within the horizon of universal, objective and transcendent truth, his thought scales "heights unthinkable to human intelligence". Rightly, then, he may be called an "apostle of the truth". Looking unreservedly to truth, the realism of Thomas could recognize the objectivity of truth and produce not merely a philosophy of "what seems to be" but a philosophy of "what is".

- 1 Why did Aquinas argue there could be no contradiction between faith and reason?
- 2 Aquinas believed in the reasonableness of faith. Why do you think it is important that our faith is reasonable?
- 3 Why does the Holy Spirit play an important role in the pursuit of knowledge?

Chapter Activities

No Restrictions

TEACHER GUIDED ACTIVITY

Warm-Up

Activity Instructions

- A** Before class, gather identical pairs of small items, e.g. two of the same book, candy bar, and others.
- B** Arrange your students into small groups and give each group one of the items you gathered prior to class.
- C** When they have finished, call on one group to share their description, and, through questioning, see how far you can get before they have to define the item in terms of what it is not. For example, if a student said the book has a green cover, 100 pages, and is made of paper, ask questions about what green is, or what pages are, and so on. Eventually, the definition will necessarily differentiate the item from other things in the world.
- D** Next, explain that these distinctions can also be called restrictions. They are limits to what the book is. It is 100 pages, not 150. It is green, and not blue. The book cannot be both blue and green at the same time. Restrictions, by definition, exclude one another. A green book cannot be blue at the same time. By being green, the book excludes blue, red, and every other color. A particle cannot be a proton and an electron, a shape cannot be both a circle and a square, and so forth.
- E** Then, give each group the other item from their pair. Ask your students if the new items they were given are the same item they already had (e.g. the same book/T-shirt/candy bar, and so forth)?
- F** Have them discuss the question for a few moments. (It is okay if students find the question absurd at first.)
- G** After a few moments, explain how the items are not the same, even though they are seemingly identical in every way. If there were truly no differences between them, they would be one. Explain that when two things are different, one must have something the other one does not, be something the other is not, be somewhere the other is not, and so forth.
- H** Now ask the question, what is there in the world that has no restrictions at all?
- I** Explain that this short activity is meant as an introduction to the ideas in St. Thomas Aquinas's proofs of God as the sole, uncaused reality that created everything else that exists. An important conclusion St. Thomas arrives at by his proofs is the idea of God as unrestricted. As we saw, wherever there is restriction, there is also exclusion. The question of whether the two pairs of items were the same was meant to show how an unrestricted entity has no boundaries, limits, or behaviors that exclude anything. When two things are different, one must have something the other one does not, be something the other is not, be somewhere the other is not, and so forth. But we say that an unrestricted entity is purely inclusive – it can form a unity with anything. Since it cannot exclude or be divided or have parts, it must be one.

Proofs for God's Existence

TEACHER GUIDED ACTIVITY

Activity 1

Activity Instructions

A Begin by arranging your students in five groups and assign each group one of the proofs for God's existence covered in this chapter:

- Aquinas' argument from motion
- Aquinas' argument from efficient cause
- Aquinas' argument from necessary being
- Aquinas' argument from degrees of being/perfection
- Aquinas' argument from the governance of the world
- Lonergan's argument that God is the answer to all questions

B Give each group a large piece of paper and make markers and/or colored pencils available. Have each group re-read together the part of the chapter pertaining to their proof and then create a poster that illustrates and explains their assigned proof. Circulate around the room and assist groups as necessary.

Note: The core of the argument from degrees of perfection is covered in Ch. 2.

To further assist your students, you may also download **Teacher Resource: The Five Ways Cards** from SophiaOnline.org/FiveWaysCards and distribute to each group the corresponding summary of each of Aquinas' proofs. These summary cards are excerpts from *The One-Minute Aquinas* by Kevin Vost (available for purchase at SophiaInstitute.com/OneMinuteAquinas).

C When they have finished, have each group present their assigned proof to the class. Conclude by asking students to share which proof (that is, the proofs themselves and not the student presentations of them) was the most and least convincing to them and why they think so.

TEACHER RESOURCE

The Five Ways Cards

Directions: Copy and cut out the cards, each one an excerpt from *The One-Minute Aquinas* by Kevin Vost. Distribute the cards and have each group read their assigned argument. Finally, have each group create a poster illustrating the proof Aquinas offers.

The Argument from Motion

Our senses tell us with certainty that some things are in motion. They change in various ways, such as in their location or in a quality such as temperature. They move from some kind of state of potentiality to an actuality. Anything that moves from a potentiality to an actuality must be made actual by something outside of itself. A thing cannot give what it does not already have. These outside sources of change cannot go on indefinitely, though, so there must be a first agent of change, a First Mover to put the series of changes in motion, as a stick moves something else only because it is put in motion by a hand.

There must be a first, unmoved mover, already completely actualized and put in motion by no other. This mover we call God.



Excerpt from
The One-Minute Aquinas,
by Kevin Vost.

The Argument from Efficient Cause

Our senses reveal an order of efficient causes by examining which effects are produced. A thing cannot cause itself, because then it would exist prior to itself, which is impossible. The chain of causation cannot go into infinity because without a first cause, no intermediate causes would exist, and to take away the cause is to take away the effect. But there are effects. Therefore, there must be a first efficient cause, and this we call God.



Excerpt from
The One-Minute Aquinas,
by Kevin Vost.

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The Kalam Cosmological Argument

Activity 2

Activity Instructions

- A** Begin by asking your students to imagine they are walking on the beach and find a watch in the sand. How do they assume the watch got there? Call on a couple of students to offer possible answers, such as someone dropped it, it was left behind when someone took it off to go swimming, and so forth.
- B** Next, ask if anyone thought the pieces of the watch assembled themselves? *No, of course not.*
- C** Then, ask your students to imagine a junkyard containing all the bits and pieces of a Boeing 747 airplane, disassembled and in disarray, lying in piles jumbled together with other pieces of junk. A tornado happens to blow through the yard. What is the chance that a fully assembled 747, ready to fly, will be found standing there after the tornado?

- D** Explain that the point of these absurd questions is to point out that we never observe things causing themselves in our lives. Believing they do is more of a stretch than believing in magic. This same way of thinking applies to the origins of the universe, and believing God exists is in truth more reasonable than believing the universe has always existed, or that it caused itself. In the last chapter we studied scientific evidence for the existence of God and how the scientific origins of the universe point to the existence of an intelligent Creator, whom we call God. In this chapter we have learned about philosophical proofs for God's existence, a conclusion arrived at by observing the world around us and using reason to logically conclude the existence of a Creator, whom we call God. There is another argument for God's existence that straddles the lines of science (cosmology) and philosophy called the Kalam Cosmological Argument. It originated in Islamic philosophical traditions in the 9th to 12th centuries (hence the name Kalam, which is Arabic for "speech, or word" and is used to refer to Islamic scholastic theology) and was debated in medieval Christian philosophy by the likes of St. Bonaventure and St. Thomas Aquinas.

The Kalam Cosmological Argument

Directions: Before watching the video, review the meaning of key terms such as entropy and the second law of thermodynamics from Chapter 1. Then, after watching the video, answer the following questions.

- 1** What is entropy? What is the Second Law of Thermodynamics?

- 2** How does entropy and the Second Law of Thermodynamics disprove the idea that the universe has always existed?

- 3** How does the Cosmological Argument show that it is quite reasonable to believe that God does exist?

- 4** How does the Kalam Argument incorporate scientific knowledge into a philosophical proof?

- 5** In what ways is the Kalam Argument similar to Aquinas's first three arguments for God's existence? How is it different?

- E** Next, show your students the short video explaining the Kalam argument found at SophiaOnline.org/KalamCosmologicalArgument. After showing the video, distribute to your students **Handout C: The Kalam Cosmological Argument** and have them answer the questions. When they have finished, call on students to share and discuss their answers.

Answer Key

- 1** Entropy is the tendency of systems to move from order to disorder. Energy cannot be created or destroyed. Therefore, as the second law of thermodynamics states, isolated systems tend to become more disorganized.
- 2** If the universe has always existed, all the usable energy would have been used up by now, and it would be in a state of maximum disorder. Since there is still much usable energy and order in the universe, it had to have a beginning a finite amount of time ago.
- 3** Because it proves that the cause of the universe must be outside the space-time universe: the cause must be spaceless, timeless, immaterial, uncaused, and unimaginably powerful, which are all attributes of God.
- 4** The Kalam argument uses scientific observations about the universe as its first and second premises then uses reason to come to the logical conclusion based on the two premises.
- 5** The Kalam argument similarly concludes that there must be an uncaused cause who is necessary for the existence of the universe that caused the universe to come to be. The Kalam argument differs from Aquinas' arguments in its basic premises, but comes to the same conclusion.

Philosophical Proofs of an Intelligent Creator True-False

Activity 3

Activity Instructions

- A** Distribute to your students **Handout D: Philosophical Proofs of an Intelligent Creator True-False** and have them complete the activity by marking each statement true or false. Then, if the statement is false, have them correct it by writing on the line what should replace the bolded word/s to make the statement accurate.
- B** When they have finished, review and discuss the correct answers.

Answer Key

- 1 False/"love of wisdom"
- 2 True
- 3 False/still valid
- 4 True
- 5 True
- 6 False/cannot go on
- 7 False/not exist
- 8 True
- 9 False/a complete set of answers
- 10 True

Philosophical Proofs of an Intelligent Creator True-False

Directions: Read each statement and write T for true or F for false. If the statement is false, correct it by writing on the line what should replace the **bolded** word/s to make it a true statement.

- _____ 1 The term *philosophy* comes from the Greek for "**scientific certainty**." _____
- _____ 2 St. Thomas Aquinas used logical reasoning to **prove** that there must be one uncaused Being which created everything else. _____
- _____ 3 If someone does not understand a philosophical proof, the proof is **not valid**. _____
- _____ 4 In Aquinas' First Way, *motion* means "**change**." _____
- _____ 5 Something **possible** (in potential) can only come to be by something **actual**. _____
- _____ 6 Efficient causes **can go on** infinitely into the past. _____
- _____ 7 If there were no uncaused being in the whole of reality, the whole of reality would **still exist**. _____
- _____ 8 The answer to questions about why reality is one way over other possibilities can only be explained by an **uncaused reality**. _____
- _____ 9 Lonergan demonstrated that uncaused reality (existence itself which exists through itself) is not only the creator of the rest of reality, but also an unrestricted immaterial act of thinking which contains **a partial set of correct answers** to the complete set of questions. _____
- _____ 10 Philosophical proofs for God's existence can tell us **what** God is, but are limited in what they can tell us about **who** God is. _____

HANDOUT A

Philosophical Proofs of an Intelligent Creator

Chapter 2 Overview

The term *philosophy*, from Greek for “love of wisdom”, refers to a reasoned study of the truth of things. We have grasped the truth when what exists and what we think exists are the same. Philosophers and scientists alike seek to understand the universe as it really is, or, in other words, to know the truth about the universe. The great Medieval philosopher St. Thomas Aquinas believed that philosophy could tell us a lot about God. St. Thomas is famous for using logical reasoning to prove God’s existence: there must be one uncaused being which creates everything else, and this reality is referred to as “God.” Using St. Thomas’s reasoning, we can simply look at the world around us and, by using our intellect, conclude that there must be a Creator.

In this chapter you will learn that ...

- Philosophy is the love of wisdom and can be used to come to reasonable knowledge of God.
- St. Thomas Aquinas demonstrated by way of five proofs for God’s existence that there must be one uncaused, unrestricted being who caused everything else.
- Contemporary philosopher Bernard Lonergan has developed a new proof for God’s existence that focuses on the intelligibility of reality: God is the complete set of correct answers to the complete set of questions.
- Philosophical proofs for God can tell us what God is – the Creator, the unique uncaused reality existing through itself, unrestricted in intelligibility and in intelligence – but they are limited in what they can tell us about who God is.



Bible Basics

The fear of the LORD is the beginning of wisdom, and the knowledge of the Holy One is insight.

– *Proverbs 9:10*

For what can be known about God is plain to them, because God has shown it to them. Ever since the creation of the world his invisible nature, namely, his eternal power and deity, has been clearly perceived in the things that have been made.

– *Romans 1:19–20*



Connections to the Catechism

- CCC 31–53
- CCC 154–159
- CCC 237
- CCC 274
- CCC 286

The text of St. Thomas Aquinas’ First and Second Ways are excerpted from the Project Gutenberg eBook edition of the Summa Theologica, Part I (Prima Pars) From the Complete American Edition, translated by the Fathers of the English Dominican Province (1947).

Chapter 2

Aa VOCABULARY

Philosophy: The study of ultimate reality and its causes by human reason alone. From the Greek word *philosophia*, which means “love of wisdom.”

Five Ways: Five arguments developed by St. Thomas Aquinas that use human reason and observation of the created world to conclude that God exists. Also called the “five proofs for the existence of God.”

The Love of Wisdom

The term **philosophy** comes from the Greek word *philosophia*, which means “love of wisdom,” but is commonly used today to mean “world-view.” For example, you may have been asked, “What is your philosophy of life?” That modern meaning is not how we are using the word here. Instead, we will use its actual meaning: a reasoned study of the truth of things.

The great Medieval philosopher St. Thomas Aquinas believed that philosophy could tell us a lot about God. St. Thomas is famous for using logical reasoning to prove God’s existence: there must be one uncaused being which created everything else – and this reality is referred to as God. Using his “**Five Ways**,” or five proofs for God’s existence, we can simply look at the world around us and, by using reason, conclude the existence of the Creator.

Before we delve into the arguments themselves, it would be beneficial to understand what a philosophical proof is and how it works. To begin, bear in mind that philosophical proofs function differently than the scientific method, which relies upon empirical data and experimentation for proof. Philosophical proofs depend upon logic as well as formulated premises, which are readily verifiable or proven by a prior argument. For a philosophical proof to be valid (true), the logic must be sound, and the premises of the argument must be verifiable in some way. Philosophical proofs can be challenging to understand, but they are valid even if we may not fully comprehend them. The same is true of the scientific method. For example, just because one does not understand the law of thermodynamics does not mean the law does not exist. The same is true when it comes to proving God’s existence.

The most basic structure of a philosophical proof has two premises and a conclusion. We call the first premise the major premise, and the second the minor premise. A proof ends with a conclusion that follows logically (in other words, it must be true) from the rational coherence of the two premises. If the premises are true, the conclusion must be true. The conclusion can then become a premise to another proof, and so on.

Armed with this understanding of how a philosophical proof works, let us now turn specifically to Aquinas’ Five Ways and a more modern argument for God’s existence.



St. Thomas Aquinas Confounding Averroes, by Giovanni di Paolo.

- ◀ To disprove the arguments Aquinas puts forth in the *Summa Theologiae*, one must either argue one or more of his premises are false, or find a flaw in his logic.

Aquinas' Five Ways

Aquinas follows the above method to go from what is near and verifiable to our experience to something which is not a self-evident truth, namely, that God exists. We will consider the first two arguments in Aquinas' own words and the others in summary.

The First Way

The first ... is the argument from *motion*.

- **Simple observation:** It is certain, and evident to our senses, that in the world some things are in motion.
- **Major premise A:** Now whatever is in motion is put in motion by another, for nothing can be in motion except as it is in potentiality to that towards which it is in motion; whereas a thing moves inasmuch as it is in act. For motion is nothing else than the reduction of something from potentiality to actuality.

- **Major Premise B:** But nothing can be reduced from potentiality to actuality, except by something in a state of actuality. Thus that which is actually hot, as fire, makes wood, which is potentially hot, to be actually hot, and thereby moves and changes it.
- **Minor premise A:** Now it is not possible that the same thing should be at once in actuality and potentiality in the same respect, but only in different respects. For what is actually hot cannot simultaneously be potentially hot; but it is simultaneously potentially cold. It is therefore impossible that in the same respect and in the same way a thing should be both mover and moved, i.e. that it should move itself. Therefore, whatever is in motion must be put in motion by another.
- **Minor premise B:** If that by which it is put in motion be itself put in motion, then this also must needs be put in motion by another, and that by another again. But this cannot go on to infinity, because then there would be no first mover, and, consequently, no other mover; seeing that subsequent movers move only inasmuch as they are put in motion by the first mover; as the staff moves only because it is put in motion by the hand.
- **Conclusion:** Therefore, it is necessary to arrive at a first mover, put in motion by no other; and this everyone understands to be God.

▼ St. Thomas's systemic proofs have instructed Christians for centuries.



Saints Peter the Martyr and Thomas Aquinas Refute the Heretics, by Andrea Di Bonaiuto.

Key to understanding Aquinas' first proof is properly understanding his terms. By "motion," Aquinas means not just movement but change. So, Aquinas' initial observation is perhaps better understood to our modern ear as "It is clear that there is change all around us in the world." Things move, or change, from one state to another. A ball moves, or changes, from a state of not moving to rolling down a hill. An object in its beginning state (before a change) cannot be in its ending state (after the change) at the same time. Something which is cold (with atoms not excited) cannot be something hot (with atoms excited) at the same time.

Furthermore, before a change, an object is said to be in **potency** (or potentiality) to its changed state (ending state). After the change, the object is said to be in **act** (actualized) to this changed state. So, we might describe change as a transition from potency to act. Using the examples above, a ball is potentially rolling down the hill until it is actually rolling down the hill. A cold object (which has only the potency to be hot) transitions from its state of potency (coldness) to act (hotness).

Something possible (in potential) can only come to be by something actual. For example, when you kick a ball, the ball cannot move on its own unless something in motion strikes it, like your foot. An object which is in potency to a new changed state must be moved (acted upon) by something else to transition from potency to act (its new changed state), because it cannot move itself to what it does not have. Remember, since the object is not yet in the new changed state, it cannot give itself what it does not have. Therefore, something else, a mover, will have to move it to where it cannot go by itself.

This gives rise to the question of whether the mover is itself something which needs to be moved from potency to act. If so, then it too would need a mover to bring it from potency to act. This would be the case for all other movers that need to be moved from potency to act – all of them would need movers. Can we go back through an infinite number of movers? No, we cannot, because an infinity of movers can never be actualized. By definition, infinity stretches on forever. If you were told that in order to get a million-dollar reward, you have to take an infinite number of steps, you would say, "Hey, that's not fair, because an infinite number of steps is impossible to complete – it can never be actualized. It simply can't be done." Now, if an infinite number of steps can never be actualized, then we cannot say that an infinite number of steps were completed to move a particular object from potency to act – the object would never be moved. It would still be awaiting the infinite number of steps to be completed (and will always be waiting), because an

Potency: In metaphysics, the capacity to act or change, or a possibility a thing can be said to have.

Act: In metaphysics, the motion, or change, that reflects the fulfillment of a possibility in a thing.

Something possible (in potential) can only come to be by something actual.

.....

First Mover: The necessary, uncaused being, or God, who first set everything in motion.

If there were no first cause that put everything in motion, nothing whatsoever would move.

infinite number of steps is not completable. So, what does this mean? There must be a **First Mover**.

What, then, must a first mover be like? It cannot be something that needs to be moved from potency to act, otherwise it would itself require a mover. Additionally, the first mover must have the capacity to move all other objects to act, because it is the source (first) to move all subsequent changes from potency to act.

The key principle of Aquinas's argument is underlined and is necessarily true: "But this cannot go on to infinity, because then there would be no first mover, and, consequently, no other mover." What is true of one thing in motion (change) is true of the collective motion (change) of the entire universe. If there were no first cause that put everything in motion, nothing whatsoever would move. There would be no motion (change) in anything, so there must be an unmoved mover that set everything else into motion. This First Mover is God. Let us look at the second proof, which builds upon the first and strengthens it.

The Second Way

The second way is from the nature of the **efficient cause**.

- **Simple Observation:** In the world of sense [like sight], we find there is an order of efficient causes.
- **Major premise:** There is no case known (neither is it, indeed, possible) in which a thing is found to be the efficient cause of itself; for so it would be prior to itself, which is impossible.
- **Minor premise A:** Now in efficient causes it is not possible to go on to infinity, because in all efficient causes following in order, the first is the cause of the intermediate cause, and the intermediate is the cause of the ultimate cause, whether the intermediate cause be several, or only one. Now to take away the cause is to take away the effect.
- **Minor premise B:** Therefore, if there be no first cause among efficient causes, there will be no ultimate, nor any intermediate cause. But if in efficient causes it is possible to go on to infinity, there will be no first efficient cause, neither will there be an ultimate effect, nor any intermediate efficient causes; all of which is plainly false.
- **Conclusion:** Therefore, it is necessary to admit a first efficient cause, to which everyone gives the name of God.

This argument is similar to the first but arrives at its conclusion by a different route. Whereas the first way is rooted in the observation that

things are in motion, or change, the second way is concerned about the cause of that change. In fact, borrowing from the ancient Greek philosopher Aristotle, Aquinas believed that all things that are actualized (that is, change from potency to act) have four causes for that change. One of those causes is the efficient (or agent) cause. An **efficient cause** is like an agent that causes other things to happen in some way. For example, an architect must imagine the house before he draws it. The idea of the house in the architect's mind is a cause of the house she draws on paper. But what caused the thought (idea) of the house in the first place? That would be the will of the architect who chooses to think of an idea for a house before drawing it. The architect is thus the efficient cause of the actual house someone builds, even if she did not build it herself.

Like the first argument, efficient causes cannot go on infinitely into the past. There must be a first efficient cause—an eternal first cause—that did not come to be by anything else, but just is. God is the name we give to that first efficient cause.

Efficient Cause: In

philosophy, the agent who brings a thing into being or initiates a change.

- ▼ An architect who conceives and designs a house is the efficient cause of that house, even if she does not build it herself.



Image courtesy Shutterstock.

The Third Way

Let us now look at Aquinas' third proof, which deals with what we might call the limited life cycle of things. Aquinas calls this way the argument from possibility and necessity. It is possible for things to exist, and to not exist. A tree, for example, grows from a planted seed, flourishes for a time, but eventually dies, decays, and ceases to be. He notes that all around us are things that come to be and cease to exist. Such beings do not have to exist, and therefore, are not existence itself. If a being is not existence itself, it does not exist through itself, but rather exists through something else – it is caused by something else. If everything in reality were caused by something else, then the whole of reality itself would have to be caused by something else. There is, however, by definition, nothing else outside the whole of reality. Thus, there must be a being in the whole of reality that does not need a cause of its existence. If there were no uncaused being in the whole of reality then the whole of reality would not exist, which is plainly false. Therefore, there must be a being which is uncaused – which exists through itself because it is existence



- This artist depicts Christ's blessing of St. Thomas, between Plato and Aristotle.

Triumph of St. Thomas Aquinas, "Doctor Communis", between Plato and Aristotle, by Benozzo Gozzoli.

itself—a necessary being. This necessary being (existence itself) is something that has always existed with no beginning or end and did not receive its existence from something else—something that never came to be because it always is. Without such a being, there would be nothing at all. We call this necessary being God.

The Fourth and Fifth Ways

These first three arguments—the most important for our purposes here—establish the foundation for the last two. Aquinas constructs the last two with the first three in mind. We have already considered in some detail the core aspects of Aquinas’ fourth way in Chapter 2: the argument from degrees of perfection. His fifth way, on the governance of the world, shows that the goal-oriented nature of all animate creatures—what philosophers refer to as **teleology**—requires an agent that moves all things intelligently to their proper end. Aquinas calls this movement of all things to their purpose and perfection the Eternal Law [the wisdom] of God.

Aquinas’s five proofs together provide a convergence of logical arguments that help the mind grasp the existence of God. We first begin with what we can observe with little difficulty. Then from there, we must ask from where these phenomena (things we observe) come from in the first place.

God Is the Answer to All Questions

As modern science has expanded beyond the limits of materialism, the contemporary philosopher Bernard Lonergan has developed a new proof for God’s existence that focuses on the intelligibility of reality.

When we ask the question, “Why?” we want to know why reality is this way instead of some other equally possible way. So, for example, when I ask, “Why did I grow up to be 5 feet 11 inches tall?” I recognize that I could have been shorter or taller than that, but there must be some cause to explain why this possibility is real, while the other ones are not.

What Lonergan realized is that these sorts of questions about causation can only be ultimately answered by an uncaused reality. Recall from Aquinas’ third proof that an uncaused reality must be existence itself, or as St. Thomas says, “existence through itself.” Recall also that this uncaused reality must be the cause of every caused reality in the whole of reality. Now if something causes the existence of another reality, it must also have the explanation of why that other reality is the way

Teleology: The study of ends or final causes.

Aquinas’s five proofs together provide a convergence of logical arguments that help the mind grasp the existence of God.

it is rather than some other way. Therefore, the cause of something's existence is its ultimate explanation. Now in as much as the uncaused reality (existence itself which exists through itself) is the ultimate cause of all other realities (which could have been some other way because they are not existence itself), the uncaused reality must also be the ultimate explanation for why everything else is the way it is, and not some other way.

We can restate this as follows: the answer to the question about why I could have been taller or shorter than I am lies in other realities outside of me. If those other realities do not exist through themselves, then the answer to the question about why they exist would lie in still other realities beyond themselves. As you can see, this chain of questions and answers will not come to a complete answer (a complete explanation to the question "Why?") until we reach an answer that explains itself completely – that is, an uncaused reality.

The chain of questions will not come to a complete answer until we reach an answer that explains itself completely.

The Complete Set of Correct Answers to the Complete Set of Questions

Recall, that the uncaused reality must be able to provide an ultimate answer to the question, "Why?" this reality existing through itself (which has no limitation to its existence) does not simply explain its own existence but explains the existence of everything else that could possibly be. It contains within itself the answers to all possible questions – and so we say that this reality is perfectly intelligible. It is the complete set of correct answers to the complete set of questions.

We now come to the culmination of Lonergan's argument. He proves that there is only one kind of reality that can be the complete set of correct answers to the complete set of questions – an unrestricted act of thinking. He shows this through a process of elimination. First, he considers whether a material thing could contain the complete set of correct answers to the complete set of questions. Of course, this cannot be, because any material reality has limits in space, time, dimension, power, qualities, and so forth. Such realities can only answer a very small number of questions. Then, he considers collections of material realities, such as a universe, a hypothetical multiverse, or some other grouping of multidimensional material realities, but these too have spatial limits, temporal limits, limits to power and qualities which prevent them from containing the complete set of correct answers to the complete set of questions. Since material realities will never be able to answer every question, Lonergan turns to immaterial realities such as



Philosopher in Meditation, by Rembrandt van Rijn.

acts of thinking. Be careful not to confuse an act of thinking with a material brain. Such a material reality could not contain the complete set of correct answers to the complete set of questions. Rather, he asserts that the act of thinking is immaterial—like the soul that emerges from our clinically dead body during a near death experience. This soul-like immaterial act of thinking would not be like our limited acts of thinking but would have enormous intellectual capacity—indeed an unrestricted intellectual capacity to contain the complete set of correct answers to the complete set of questions.

So what has Lonergan demonstrated? He shows that the uncaused reality (existence itself which exists through itself) is not only the creator of the rest of reality, but also an unrestricted immaterial act of thinking which contains the complete set of correct answers to the complete set of questions. When we combine Aquinas' third proof with Lonergan's proof, we arrive at the following conclusion: there must exist one uncaused, unrestricted act of consciousness or thinking which is the ultimate cause of the existence and intelligibility of everything else that exists, which we call God.

- ▲ Scientists, philosophers, and theologians through the ages have compared complete knowledge to knowing the mind of God.

Conclusion

Notice that all these proofs for God's existence – and the many others we did not discuss here – only conclude that God exists and that he is unique, uncaused, unrestrictedly intelligent and a creator. They tell us what God is – the Creator, the unique uncaused reality existing through itself, unrestricted in intelligibility and in intelligence – but they are limited in what they can tell us about who God is. For example, we could never discover the Father revealed to us by Jesus in the Parable of the Prodigal Son. Logical proofs and scientific evidence are powerless to probe the heart of the unrestrictedly intelligent God.

While it is unlikely that one single philosophical proof will be wholly convincing to a non-believer, many proofs and sets of scientific evidence taken together do provide intriguing demonstrations of evidence for God's existence difficult to deny. Yet there are still many unanswered questions. Does this God love us, or is He indifferent to us (as Aristotle and Einstein thought)? Is there a Heaven or a Hell? Are we a special creation of God? Reason and science cannot give us the answers to these questions. To know these things, God will have to reveal Himself to us – and so we will have to seek not only the evidence from reason and science, but also that of God's self-revelation – specifically, the revelation of Jesus Christ.



- ▶ Ancient philosophers used reason to arrive at the existence of God, but were left with many unanswered questions about who He is.

The Death of Socrates, by Jacques Louis David.

Focus and Reflection Questions

- 1 What does the word *philosophy* mean?
- 2 What did St. Thomas Aquinas famously use philosophy to prove?
- 3 What do philosophical proofs depend on? What is needed for a proof to be true? What is the most basic structure of a philosophical proof?
- 4 In Aquinas' First Way, what does he mean by "motion"? What is his initial observation?
- 5 How does Aquinas use the concepts of potency and act to prove that God must exist?
- 6 What is an efficient cause in Aquinas' Second Way? How does he prove God's existence using efficient causality?
- 7 According to Aquinas' Third Way, why is God the one necessary being in all existence?
- 8 In Aquinas' Fifth Way, what is required by the goal-oriented nature of all animate creatures?
- 9 Why does Lonergan argue that there must be an uncaused reality that we call God?
- 10 According to Lonergan, why can't any material thing or any material realities provide a complete set of answers to a complete set of questions?
- 11 What can we conclude by combining Aquinas' Third Way with Lonergan's proof?
- 12 What do the proofs for God studied in this chapter ultimately tell us about God? What are they unable to tell us?
- 13 While it is unlikely that any one single philosophical proof will be wholly convincing to a non-believer, what can they provide when taken together?

Straight to the Source

ADDITIONAL READINGS FROM PRIMARY SOURCES

***Fides et Ratio* 36, an Encyclical Letter of Pope St. John Paul II, September 14, 1998**

36. One of the major concerns of classical philosophy was to purify human notions of God of mythological elements. We know that Greek religion, like most cosmic religions, was polytheistic, even to the point of divinizing natural things and phenomena. Human attempts to understand the origin of the gods and hence the origin of the universe find their earliest expression in poetry; and the theogonies remain the first evidence of this human search. But it was the task of the fathers of philosophy to bring to light the link between reason and religion. As they broadened their view to include universal principles, they no longer rested content with the ancient myths, but wanted to provide a rational foundation for their belief in the divinity. This opened a path which took its rise from ancient traditions but allowed a development satisfying the demands of universal reason. This development sought to acquire a critical awareness of what they believed in, and the concept of divinity was the prime beneficiary of this. Superstitions were recognized for what they were and religion was, at least in part, purified by rational analysis. It was on this basis that the Fathers of the Church entered into fruitful dialogue with ancient philosophy, which offered new ways of proclaiming and understanding the God of Jesus Christ.

- 1 What was a major concern of classical philosophy? Explain.
- 2 What does Pope St. John Paul II say was the earliest expression of the human search for the divine?
- 3 How was it that the Fathers of the Church could enter into fruitful dialogue with ancient philosophy?

***Fides et Ratio* 43–44, an Encyclical Letter of Pope St. John Paul II, September 14, 1998**

43. A quite special place in this long development belongs to Saint Thomas, not only because of what he taught but also because of the dialogue which he undertook with the Arab and Jewish thought of his time. In an age when Christian thinkers were rediscovering the treasures of ancient philosophy, and more particularly of Aristotle, Thomas had the great merit of giving pride of place to the harmony which exists between faith and reason. Both the light of reason and the light of faith come from God, he argued; hence there can be no contradiction between them.

More radically, Thomas recognized that nature, philosophy's proper concern, could contribute to the understanding of divine Revelation. Faith therefore has no fear of reason, but seeks it out and has trust in it. Just as grace builds on nature and brings it to fulfilment, so faith builds upon and perfects reason. Illumined by faith, reason is set free from the fragility and limitations deriving from the disobedience of sin and finds the strength required to rise to the knowledge of the Triune God. Although he made much of the supernatural character of faith, the Angelic Doctor did not overlook the importance of its reasonableness; indeed he was able to plumb the depths and explain the meaning of this reasonableness. Faith is in a sense an "exercise of thought"; and human reason is neither annulled nor debased in assenting to the contents of faith, which are in any case attained by way of free and informed choice.

This is why the Church has been justified in consistently proposing Saint Thomas as a master of thought and a model of the right way to do theology. In this connection, I would recall what my Predecessor, the Servant of God Paul VI, wrote on the occasion of the seventh centenary of the death of the Angelic Doctor: “Without doubt, Thomas possessed supremely the courage of the truth, a freedom of spirit in confronting new problems, the intellectual honesty of those who allow Christianity to be contaminated neither by secular philosophy nor by a prejudiced rejection of it. He passed therefore into the history of Christian thought as a pioneer of the new path of philosophy and universal culture. The key point and almost the kernel of the solution which, with all the brilliance of his prophetic intuition, he gave to the new encounter of faith and reason was a reconciliation between the secularity of the world and the radicality of the Gospel, thus avoiding the unnatural tendency to negate the world and its values while at the same time keeping faith with the supreme and inexorable demands of the supernatural order”.

44. Another of the great insights of Saint Thomas was his perception of the role of the Holy Spirit in the process by which knowledge matures into wisdom. From the first pages of his *Summa Theologiae*, Aquinas was keen to show the primacy of the wisdom which is the gift of the Holy Spirit and which opens the way to a knowledge of divine realities. His theology allows us to understand what is distinctive of wisdom in its close link with faith and knowledge of the divine. This wisdom comes to know by way of connaturality; it presupposes faith and eventually formulates its right judgement on the basis of the truth of faith itself: “The wisdom named among the gifts of the Holy Spirit is distinct from the wisdom found among the intellectual virtues. This second wisdom is acquired through study, but the first ‘comes from on high’, as Saint James puts it. This also distinguishes it from faith, since faith accepts divine truth as it is. But the gift of wisdom enables judgement according to divine truth”.

Yet the priority accorded this wisdom does not lead the Angelic Doctor to overlook the presence of two other complementary forms of wisdom – philosophical wisdom, which is based upon the capacity of the intellect, for all its natural limitations, to explore reality, and theological wisdom, which is based upon Revelation and which explores the contents of faith, entering the very mystery of God.

Profoundly convinced that “whatever its source, truth is of the Holy Spirit” (*omne verum a quocumque dicatur a Spiritu Sancto est*) Saint Thomas was impartial in his love of truth. He sought truth wherever it might be found and gave consummate demonstration of its universality. In him, the Church’s Magisterium has seen and recognized the passion for truth; and, precisely because it stays consistently within the horizon of universal, objective and transcendent truth, his thought scales “heights unthinkable to human intelligence”. Rightly, then, he may be called an “apostle of the truth”. Looking unreservedly to truth, the realism of Thomas could recognize the objectivity of truth and produce not merely a philosophy of “what seems to be” but a philosophy of “what is”.

- 1 Why did Aquinas argue there could be no contradiction between faith and reason?
- 2 Aquinas believed in the reasonableness of faith. Why do you think it is important that our faith is reasonable?
- 3 Why does the Holy Spirit play an important role in the pursuit of knowledge?

The Kalam Cosmological Argument

Directions: Before watching the video, review the meaning of key terms such as entropy and the second law of thermodynamics from Chapter 1. Then, after watching the video, answer the following questions.

- 1 What is entropy? What is the Second Law of Thermodynamics?

- 2 How does entropy and the Second Law of Thermodynamics disprove the idea that the universe has always existed?

- 3 How does the Cosmological Argument show that it is quite reasonable to believe that God does exist?

- 4 How does the Kalam Argument incorporate scientific knowledge into a philosophical proof?

- 5 In what ways is the Kalam Argument similar to Aquinas's first three arguments for God's existence? How is it different?

Philosophical Proofs of an Intelligent Creator

True-False

Directions: Read each statement and write T for true or F for false. If the statement is false, correct it by writing on the line what should replace the **bolded** word/s to make it a true statement.

- _____ 1 The term *philosophy* comes from the Greek for "**scientific certainty**." _____
- _____ 2 St. Thomas Aquinas used logical reasoning to **prove** that there must be one uncaused Being which created everything else. _____
- _____ 3 If someone does not understand a philosophical proof, the proof is **not valid**. _____
- _____ 4 In Aquinas' First Way, *motion* means "**change**." _____
- _____ 5 Something **possible** (in potential) can only come to be by something **actual**. _____
- _____ 6 Efficient causes **can go on** infinitely into the past. _____
- _____ 7 If there were no uncaused being in the whole of reality, the whole of reality would **still exist**.

- _____ 8 The answer to questions about why reality is one way over other possibilities can only be explained by an **uncaused reality**. _____
- _____ 9 Lonergan demonstrated that uncaused reality (existence itself which exists through itself) is not only the creator of the rest of reality, but also an unrestricted immaterial act of thinking which contains **a partial set of correct answers** to the complete set of questions.

- _____ 10 Philosophical proofs for God's existence can tell us **what** God is, but are limited in what they can tell us about **who** God is. _____



What Questions Are Raised by God's Existence?

Teacher Introduction

After looking at scientific and philosophical evidence for the existence of God, we will turn in this chapter to some questions raised by God's existence. Since we have used logical arguments to demonstrate it is reasonable to believe in God, it is natural to ask: can we use reason to prove God does not exist? Do science and the Bible conflict? And, if there is so much evidence for God, then why do we need faith?

As your class is introduced to the common reasons to doubt God's existence, be sensitive to which of these might be especially attractive to the students in your class. Whether they know it or not, some students may be especially influenced by Marxism or Scientism. They may have an incorrect view of who God is. This chapter is a chance to begin rationally addressing some of these misconceptions with charity.

Chapter at a Glance

Enduring Understandings

In this chapter, students will understand that...

- The existence of God cannot, in principle, be rationally disproved.
- To know more about who God is, we must turn to revelation.
- There is no real conflict between the truths of science and the truths of faith.
- The story of creation in the Book of Genesis was not written as a scientific explanation of the creation of the world, even though there are incidental points of intersection.
- As long as certain truths about creation are maintained, Catholics are free to believe that evolution is a viable theory.
- Most reasons people give for doubting God's existence lack a reasonable basis and can easily be refuted.

Essential Questions

- Why can't the existence of God be rationally disproved?
- What can we learn about God through revelation?
- How do science and faith complement one another?
- What is the purpose of the story of creation in the Book of Genesis?
- How should Catholics approach the theory of evolution?
- How can the common reasons given for doubting God's existence be refuted?

Lesson Plan Chart

ACTIVITY

Handout A: What Questions Are Raised by God's Existence? and Focus and Reflection Questions

Handout B: Straight to the Source Primary Source Material

Handout C: Warm-up: Science and Theology Venn Diagram

Activity #1: Fulfilling Our Desires (Teacher-guided activity)

Activity #2: Handout D: Why Does God Reveal Himself?

Activity #3: Handout E: What Questions Are Raised by God's Existence True-False

Activity #4: Handout F: Wonders of Nature: Biodiversity

What Your Students Will Learn

Vocabulary

- Empirical Evidence
- Law of Noncontradiction
- Deism
- Young Earth Creationism
- Naturalism

Scripture Encounters

- Genesis 1:26–27
- Ecclesiastes 8:17

Connections to the Catechism

- CCC 154–159
- CCC 274
- CCC 282–289
- CCC 2123–2128
- CCC 2293–2294

Straight to the Source

Additional readings from primary sources

- *Divino Afflante Spiritu* 1, an Encyclical Letter of Pope Pius XII, September 30, 1943
- *Humani Generis* 36, an Encyclical Letter of Pope Pius XII, August 12, 1950
- *Fides et Ratio* 5, an Encyclical Letter of Pope St. John Paul II, September 14, 1998

Materials

- One sheet of lined paper and a pen, tape or push-pins, a Bible for each group of two to three students.
- Several sets of cards from Teacher Resource: Desire Cards available at SophiaOnline.org/DesireCards
- Video titled “Why Does God Reveal Himself?” found at SophiaOnline.org/Reveal

Focus and Reflection Questions

Homework

Distribute to your students and have them read **Handout A: What Questions Are Raised by God's Existence?** and answer the focus and reflection questions. You may also consider having your students read the primary sources on **Handout B: Straight to the Source** and answer the reflection questions.

Answer Key

- 1 To understand the world as it really is.
- 2 *A posteriori* (Latin for "from the later") evidence is based on simple observation and empirical evidence and can be used to prove that something exists. Using a posteriori evidence to disprove something is impossible, however, because one would have to exhaustively search everywhere to confirm that the thing is nowhere to be found. to disprove God by this method, we would not only have to search our entire universe, but the whole of reality beyond our universe (which we cannot currently do and may not, in principle, ever be able to do).

- 3 The Law of Noncontradiction is an example of a priori evidence, which is Latin for "from the earlier." A priori knowledge comes from the use of reason and deduction rather than from empirical observation. The Law of Noncontradiction dictates that any intrinsic contradiction is impossible, and therefore, false. God is unrestricted – His very essence is being itself. Therefore, no finite reality can contradict Him. The only way to attempt to disprove God is to claim that He is restricted and non-transcendent, in which case He would no longer be God anyway.

- 4 God is not simply a What, but also a Who. The evidence of reason allows us to build a bridge of understanding to God, and there are reasons it is rational to trust in God's revelation. Ultimately, however, when confronted with the evidence, it takes a personal and freely chosen act of faith to believe in Him.

Focus and Reflection Questions

- 1 What is the shared goal of both science and religion?
- 2 What is a-posteriori evidence? Why can't it be used to disprove God's existence?
- 3 What is the Law of Non-Contradiction? How does it show that God cannot, in principle, be rationally disproved?
- 4 Why is it not enough to come to knowledge of God's existence by reason alone?
- 5 Why can't faith and science be in actual conflict with one another?
- 6 What two approaches did Pope Pius XII suggest we use to approach understanding creation and nature?
- 7 What truths about creation are revealed to us in the Bible through the process of inspiration? Why?
- 8 What are Catholics obligated to believe regarding creation? Providing these truths are maintained, what can Catholics believe regarding the theory of evolution?
- 9 What is naturalism? Why is it a limiting approach to our understanding of the world?
- 10 What does Christianity teach about suffering?
- 11 How does Christianity disprove the claim of Communism that Christianity is a tool to distract and control the working class?
- 12 Why isn't the possibility of intelligent alien life an obstacle to belief in God?

-
- 5 They come from the same source: the infinite mind and all-loving heart of God.
-
- 6 First, the Bible – which reveals sacred truths necessary for salvation – and second, science – which uses an empirical-mathematical method to give descriptions and explanations of the physical world.
-
- 7 God inspired the human authors of the Bible – who contributed their own thought patterns, cultural perspectives, and so forth to the formation of the text – to reveal the truths God wanted known for the sake of salvation in an intelligible way. Some of these truths are that everything in the world was created by the one God, that this creation is good, and that man was specially created in God’s image and likeness. At the time the Book of Genesis was written, its Israelite audience was surrounded by cultures who believed very different and distorted things about the world. The account of Creation in Genesis, then, was not intended to be science, but rather to counter the false beliefs of these cultures and their influence on the Israelites.
-
- 8 Catholics are obligated to believe that God creates a unique, transphysical soul in every human being, which, is not biological, and thus not subject to an evolutionary process. Provided these truths are maintained, Catholics are free to consider the theory of evolution as valid.
-
- 9 Naturalism is the notion that we cannot entertain a supernatural reality until every natural reason for physical reality has been exhausted. It is limiting because there are many realities that go beyond what can be observed in nature that, if we do not consider them, would artificially limit our human experience and therefore our purpose in life and fulfillment.
-
- 10 There is genuine purpose in suffering that leads to purification of our love and faith.
-
- 11 Far beyond being a tool to placate the masses, Christianity has always been central to many advances in social justice in fields like education, social welfare, and healthcare.
-
- 12 The possibility of intelligent alien life is not an obstacle to belief in God because, as with the creation of humans, we would assume that the creation of such beings involved the direct creation by God of the transphysical soul, that such beings were invited to the same relationship with God as we are, and that they are beneficiaries, like we are, of the Son of God’s salvific sacrifice.

Straight to the Source

Primary Source Activity

Answer Key

DIVINO AFFLANTE SPIRITU 1

- 1 In order “to teach, to reprove, to correct, to instruct in justice: that the man of God may be perfect, furnished to every good work.”
- 2 The “divine origin and the correct interpretation of the Sacred Writings.”
- 3 Because “having been written under the inspiration of the Holy Spirit, they have God for their author, and as such were handed down to the Church herself.” The Council is making this point to prove that God is the author of Scripture in its entirety, and the Church faithfully guards and hands down what has been given to her by God. Accept other reasoned answers.

HUMANI GENERIS 36

- 1 Research and discussion regarding the doctrine of evolution.
- 2 He says research and discussion about evolution must be grounded in the truth that every human soul is “immediately created by God.”
- 3 He says that many people act as if divine revelation is not to be taken seriously regarding the origin of human life and the human body.

FIDES ET RATIO 5

- 1 He says the Church views philosophy as a pursuit of great value, because it offers “an indispensable help for a deeper understanding of faith and for communicating the truth of the Gospel to those who do not yet know it.”

Straight to the Source

ADDITIONAL READINGS FROM PRIMARY SOURCES

Divino Afflante Spiritu 1, an Encyclical Letter of Pope Pius XII, September 30, 1943

1. Inspired by the Divine Spirit, the Sacred Writers composed those books [of Sacred Scripture], which God, in His paternal charity towards the human race, deigned to bestow on them in order “to teach, to reprove, to correct, to instruct in justice: that the man of God may be perfect, furnished to every good work.” This heaven-sent treasure Holy Church considers as the most precious source of doctrine on faith and morals. No wonder therefore that, as she received it intact from the hands of the Apostles, so she kept it with all care, defended it from every false and perverse interpretation and used it diligently as an instrument for securing the eternal salvation of souls, as almost countless documents in every age strikingly bear witness. In more recent times, however, since the divine origin and the correct interpretation of the Sacred Writings have been very specially called in question, the Church has with even greater zeal and care undertaken their defense and protection. The sacred Council of Trent ordained by solemn decree that “the entire books with all their parts, as they have been wont to be read in the Catholic Church and are contained in the old vulgate Latin edition, are to be held sacred and canonical.” In our own time the Vatican Council, with the object of condemning false doctrines regarding inspiration, declared that these same books were to be regarded by the Church as sacred and canonical “not because, having been composed by human industry, they were afterwards approved by her authority, nor merely because they contain revelation without error, but because, having been written under the inspiration of the Holy Spirit, they have God for their author, and as such were handed down to the Church herself.” When, subsequently, some Catholic writers, in spite of this solemn definition of Catholic doctrine, by which such divine authority is claimed for the “entire books with all their parts” as to secure freedom from any error whatsoever, ventured to restrict the truth of Sacred Scripture solely to matters of faith and morals, and to regard other matters, whether in the domain of physical science or history, as “obiter dicta” and – as they contended – in no wise connected with faith, Our Predecessor of immortal memory, Leo XIII in the Encyclical Letter *Providentissimus Deus*, published on November 18 in the year 1893, justly and rightly condemned these errors and safe-guarded the studies of the Divine Books by most wise precepts and rules.

- 1 Why did God bestow Scripture on mankind?
- 2 What does Pope Pius XII say has been called into question about Scripture in more recent times?
- 3 What was the reason the Vatican Council declared the entirety of Scripture to be held sacred and canonical? Why do you think this point is important to make?

***Humani Generis* 36, an Encyclical Letter of Pope Pius XII, August 12, 1950**

36. The Teaching Authority of the Church does not forbid that, in conformity with the present state of human sciences and sacred theology, research and discussions, on the part of men experienced in both fields, take place with regard to the doctrine of evolution, in as far as it inquires into the origin of the human body as coming from pre-existent and living matter – for the Catholic faith obliges us to hold that souls are immediately created by God. However, this must be done in such a way that the reasons for both opinions, that is, those favorable and those unfavorable to evolution, be weighed and judged with the necessary seriousness, moderation and measure, and provided that all are prepared to submit to the judgment of the Church, to whom Christ has given the mission of interpreting authentically the Sacred Scriptures and of defending the dogmas of faith. Some however, rashly transgress this liberty of discussion, when they act as if the origin of the human body from pre-existing and living matter were already completely certain and proved by the facts which have been discovered up to now and by reasoning on those facts, and as if there were nothing in the sources of divine revelation which demands the greatest moderation and caution in this question.

- 1 What does Pope Pius XII clarify that the Teaching Authority of the Church does not forbid?
- 2 How does he qualify his statement about research and discussion of the doctrine of evolution (what must be the foundation of research and discussion)?
- 3 According to Pope Pius XII, in what way do many people “transgress” this liberty of discussion about the doctrine of evolution?

***Fides et Ratio* 5, an Encyclical Letter of Pope St. John Paul II, September 14, 1998**

5. On her part, the Church cannot but set great value upon reason’s drive to attain goals which render people’s lives ever more worthy. She sees in philosophy the way to come to know fundamental truths about human life. At the same time, the Church considers philosophy an indispensable help for a deeper understanding of faith and for communicating the truth of the Gospel to those who do not yet know it.

Therefore, following upon similar initiatives by my Predecessors, I wish to reflect upon this special activity of human reason. I judge it necessary to do so because, at the present time in particular, the search for ultimate truth seems often to be neglected. Modern philosophy clearly has the great merit of focusing attention upon man. From this starting-point, human reason with its many questions has developed further its yearning to know more and to know it ever more deeply. Complex systems of thought have thus been built, yielding results in the different fields of knowledge and fostering the development of culture and history.

Anthropology, logic, the natural sciences, history, linguistics and so forth—the whole universe of knowledge has been involved in one way or another. Yet the positive results achieved must not obscure the fact that reason, in its one-sided concern to investigate human subjectivity, seems to have forgotten that men and women are always called to direct their steps towards a truth which transcends them.

Sundered from that truth, individuals are at the mercy of caprice, and their state as person ends up being judged by pragmatic criteria based essentially upon experimental data, in the mistaken belief that technology must dominate all. It has happened therefore that reason, rather than voicing the human orientation towards truth, has wilted under the weight of so much knowledge and little by little has lost the capacity to lift its gaze to the heights, not daring to rise to the truth of being. Abandoning the investigation of being, modern philosophical research has concentrated instead upon human knowing. Rather than make use of the human capacity to know the truth, modern philosophy has preferred to accentuate the ways in which this capacity is limited and conditioned.

This has given rise to different forms of agnosticism and relativism which have led philosophical research to lose its way in the shifting sands of widespread skepticism. Recent times have seen the rise to prominence of various doctrines which tend to devalue even the truths which had been judged certain. A legitimate plurality of positions has yielded to an undifferentiated pluralism, based upon the assumption that all positions are equally valid, which is one of today’s most widespread symptoms of the lack of confidence in truth. Even certain conceptions of life coming from the East betray this lack of confidence, denying truth its exclusive character and assuming that truth reveals itself equally in different doctrines, even if they contradict one another. On this understanding, everything is reduced to opinion; and there is a sense of being adrift. While, on the one hand, philosophical thinking has succeeded in coming closer to the reality of human life and its forms of expression, it has also tended to pursue issues—existential, hermeneutical or linguistic—which ignore the radical question of the truth about personal existence, about being and about God. Hence we see among the men and women of our time, and not just in some philosophers, attitudes of widespread distrust of the human being’s great capacity for knowledge. With a false modesty, people rest content with partial and provisional truths, no longer seeking to ask radical questions about the meaning and ultimate foundation of human, personal and social existence. In short, the hope that philosophy might be able to provide definitive answers to these questions has dwindled.

- 1 According to Pope St. John Paul II, how does the Church view philosophy?
- 2 According to the pope, what vital investigation has modern philosophical research abandoned? What investigation has philosophical research instead turned to?
- 3 What has this shift in philosophical research led to? Give an example.
- 4 What does the pope say most people “rest content with”? What kinds of questions have been abandoned because of this “false modesty” in society?

- 2 He says modern philosophical research has abandoned the investigation of being, concentrating instead upon human knowing.
- 3 He says it has led to widespread skepticism, pluralism, and lack of confidence in truth. Accept reasoned answers.
- 4 He says most people rest content with partial and provisional truths and have abandoned the search for the ultimate meaning of human existence.

Chapter Activities

HANDOUT C

Science and Theology Venn Diagram

Warm-Up

Activity Instructions

A Begin by asking your students to recap what they have learned that science and philosophy can tell us about God. Keep a list on the board of student answers. Answers may include that God exists, that He is the First Mover, a First Efficient Cause, and a Necessary Being. He is the ultimate cause of existence and the intelligibility of everything there is. He is the perfection of our transcendental desires. Science and reason, however, cannot go much further than this in telling us who God is.

B Next, explain to your students that thus far in this course, they have been learning about how science and religion can reveal to us knowledge of God and how science and religion seek the same thing but from different approaches. Both seek to understand the world as it is.

C Then, distribute to your students **Handout C: Science and Theology Venn Diagram** and have them complete the activity with a partner. Have students work to place the words in the bank in the proper spaces in the Venn diagram in order to demonstrate and compare the various methods used by science and religion and the ones they share in common.

D When they have finished, create a master Venn diagram on the board and invite students to come to the board to help fill it out and discuss their answers.

Answer Key

- Science only: Experimentation, Measurement, Mathematics
- Religion only: Divine Revelation, Apostolic Tradition
- Both: Logic, Reason, Observation

HANDOUT C

Science and Theology Venn Diagram

Directions: Complete the Venn diagram by putting each item in the proper space. Consider what each discipline uses as it seeks to understand the universe as it really is.

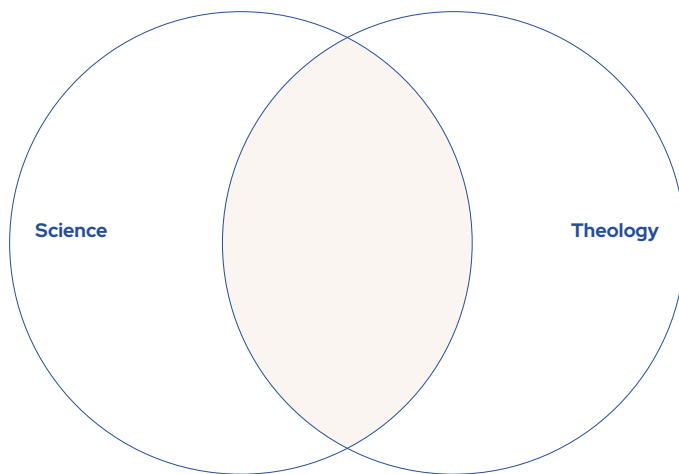
Word Bank

Experimentation
Logic

Reason
Divine Revelation

Apostolic Tradition
Observation

Mathematics
Measurement



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High School Chapter 3: What Questions Are Raised by God's Existence?

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Fulfilling Our Desires

TEACHER GUIDED ACTIVITY

Teacher's Note: Prior to class, print out enough copies of **Teacher Resource: Desire Cards**, found at SophiaOnline.org/DesireCards, so that small groups of students can each have one card.

Activity 1

Activity Instructions

- A** Begin by arranging students into small groups and giving each group one of the cards from **Teacher Resource: Desire Cards**. Have each group work together to explain how the desire listed on their card is satisfied and how evolution as they understand it might explain the way the desire is fulfilled.
- B** When they have finished, call on groups to share and discuss their responses. For example: Desire for sweet/savory foods can be fulfilled by healthy meals and good cooking. This desire for pleasant-tasting foods may have evolved from a need to protect the body from spoiled meat. And so forth. Allow students to be creative in their responses. *(Note: Wait until last to call on the group who received the card labeled "The Desire for Perfection.")*
- C** Note how every desire listed has a way to be fulfilled, and then turn to the group which discussed perfection, inviting them to share their discussion.
- D** When they have finished, explain that the theory of evolution says we adapt to our environment, but there is no perfection in our environment to adapt to. Humans could not have evolved to have a desire for perfection since that perfection is not attainable in this world. If anything, desire for perfection would be selected against! Since we do have a desire for perfection (that could not have evolved), and because all our other desires can be satisfied, it is reasonable that there is a good that is perfect and can satisfy our desire for perfection, which we call God. Our desire for perfection is really a desire for God.

TEACHER RESOURCE

Desire Cards

Desire for safety from predators in the animal world.	Desire for hugs or comfort when we are sad.
Desire to have enough to drink.	Desire for adequate food.
Desire for sweet and/or savory food.	Desire to have our things returned to us when we loan them, or if they are stolen.
Desire to be respected.	Desire for friendship.
Desire to learn.	Desire for a spouse.
Desire for perfection.	

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Why Does God Reveal Himself?

Activity 2

Activity Instructions

- A** Begin by asking your students why they think God has revealed Himself to us. Accept reasoned answers, which should include at this point because there is only so much we can know about Him on our own by means of science and reason.
- B** Next, show your students the video titled “Why Does God Reveal Himself?” found at SophiaOnline.org/Reveal.
- C** After viewing the video, distribute to your students **Handout D: Why Does God Reveal Himself?** and have them work individually to respond to the reflection questions.
- D** When they have finished, call on students to review and discuss their responses.

Answer Key

- 1** God is happy in Himself. He does not need the world or to reveal Himself to us. But He does anyways because, as 1 John 4:8 tells us, “God is love.” From the human perspective, when we experience something beautiful, we wish to share the experience with someone we love. Love desires the good of the other and wants the other to share in its own happiness. God desires to create for the simple reason that creation may share in His glory.
- 2** Accept reasoned answers.
- 3** Accept reasoned answers which should include reference to the fact that in order for us to love God, we must know Him. The converse is also true, our knowledge of God should lead to love of Him.
- 4** Accept reasoned answers drawn from the chapter text.

Why Does God Reveal Himself?

Directions: First, watch the video titled “Why Does God Reveal Himself?” Then, answer the questions.

- 1** What reasons does the video give for why God reveals Himself to us?

- 2** St. Thomas Aquinas said, “*Bonum diffusivum sui*,” Latin for, “The good is diffusive of itself.” Love wants the other to share in his own happiness. Describe a time this was true for you. What was it like to share your happiness with another?

- 3** The video concludes that man can only love what he knows. What would you say to someone who said that theology class should just be about learning to love God, and not knowing about Him? What would you say to someone who says theology class should just be about learning about God?

- 4** Despite all the evidence from science and human reason, and despite His gift of self-revelation, some people still do not believe in God. The chapter text addresses several common reasons people give for doubting God’s existence. Choose one of the reasons given in the chapter and write a brief response to someone who might give that reason for their lack of belief.

What Questions Are Raised by God's Existence True-False

Activity 3

Activity Instructions

- A** Distribute to your students **Handout E: What Questions Are Raised by God's Existence True-False** and have them complete the activity by marking each statement true or false. Then, if the statement is false, have them correct it by writing on the line what should replace the bolded word/s to make the statement accurate.
- B** When they have finished, review and discuss the correct answers.

Answer Key

- 1 True
- 2 False/could not have
- 3 True
- 4 False/cannot
- 5 True
- 6 False/agnostics; atheists
- 7 False/*Divino Afflante Spiritu*
- 8 True
- 9 False/are
- 10 True
- 11 True
- 12 False/does not mean we need to question

What Questions Are Raised by God's Existence True-False

Directions: Read each statement and write T for true or F for false. If the statement is false, correct it by writing on the line what should replace the **bolded** word/s to make it a true statement.

- 1 Science has the same goal as religion: to understand the world **as it really is**.
- 2 Because of our environment, humans **could have** evolved to develop a desire for perfection.
- 3 Using **reason alone**, we can know there is one creator who is the source of transcendental love, truth, beauty, and goodness.
- 4 The existence of God **can** be disproven.
- 5 Historically, many thinkers who used only logical proofs to learn about God concluded that He was **distant and indifferent**.
- 6 **Atheists** say they cannot be sure whether or not God exists, while **agnostics** assert He does not exist.
- 7 Pope Pius XII addressed the creation issue in his encyclical ***Deus Caritas Est***.
- 8 In his encyclical *Humani Generis*, Pope Pius XII explained that Catholics believe in the creation by God of **a unique soul** in every human being.
- 9 As long as certain truths regarding creation are maintained, Catholics **are not free** to consider evolution as a scientifically valid theory.
- 10 Sigmund Freud asserted that believing in God was **just wishful thinking**.
- 11 Given the many trillions of stars in our universe's billions of galaxies, it seems **likely** that a certain number of planets would have conditions favorable to life.
- 12 The possible future discovery of alien life in the universe **must cause us to reevaluate** our belief in God.

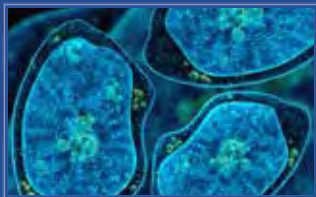
Wonders of Nature: Biodiversity

Activity 4

Activity Instructions

- A** For homework the night before teaching this lesson, arrange your students into groups based on the habitats of living things: grassland, deciduous forest, coniferous forest, desert, freshwater, marine, taiga. Have students research their assigned habitat for homework and choose an organism that lives in it that they did not know about before. (You may want to subdivide the groups to look for different types of organisms in the habitat: plants, algae, animals, fungi.) Have them bring in an image of the organism, and, on another sheet of paper, write the common and scientific name of the organism and its habitat.
- B** Prior to class, prepare a sheet of lined paper and a pen. As students enter your room, have them write the name of their organism and its habitat on one line and leave a blank beside it. Once all students have done so, make a copy of the list for each student in the class.
- C** Next, have students post their organism images they selected for homework around the room with a number on each image. (Distribute tape or sticky tack if necessary.) Alternatively, you could have students leave their images at their desks facing up, rather than posting them.
- D** Then, have students walk around to the different images and try to identify each one. They should write the number of each organism beside the name/habitat they think it is on the list you distributed. They should return to their seat when they are done.
- E** Once all students have finished, go around the room pointing to the images one at a time, and have their owners tell the class the correct answer. You may also have them say a few quick facts about the organism.
- F** Next, ask students to reflect for a moment on the question: How can it be that there are so many different types of living things? Not only are there different categories of living things, like fungi, plants, and animals, but also so very many varieties within these categories!
- G** Then, distribute to your students **Handout F: Wonders of Nature: Biodiversity** and have them work in pairs or trios to contemplate the images using the discussion questions to guide their conversation. Note that each group will need a Bible for the final reflection question.
- H** When they have finished, call on groups to share about their discussions. Allow the conversation to go in unexpected places, while directing it towards an appreciation for how biodiversity is a sign of our loving Creator, and how the beauty of nature bears witness to God.
- I** Close by praying Psalm 8 aloud followed by a few moments of silent prayer.

Wonders of Nature: Biodiversity



Three amoebas. Image courtesy Shutterstock.



Monkfish. Image courtesy SUBnormal Team.



Male Indian leopard. Image courtesy Srikanth Sekar.



Purple Orchid Flower. Image Courtesy Lawanga Ranwala

Wonders of Nature: Biodiversity

Directions: Take a few moments to observe the images on the previous page and think about the images of different organisms you and your classmates brought in for today's class. Then, discuss the following questions with a partner or two.

- 1 You just completed an activity about organisms that had not been known to you and your classmates before. Which organism was the most memorable to you, and why?
- 2 Even biologists themselves do not know every species that exists – or even how many there are. Biologist Robert May explained in 2010 in the journal *Science*: “We could defend numbers exceeding 100 million, or as low as 3 million.” Have you ever thought about the incredible variety of living things in the world (also known as biodiversity)? Why do you think biologists do not know how many different living things there are in the world?
- 3 An even greater mystery than how there is such great diversity is why! Why do you think there are so many different types of living things? Why do you think are they all so beautiful, in their own unique way?
- 4 How would you connect the adaptation of species to their environment to what we have learned in this unit about entropy (hint: Do systems left to themselves become more orderly and complex, or less orderly?) and about the need for a first cause?
- 5 Pope Emeritus Benedict XVI quoted Plato as saying, “The beautiful wounds, which is exactly how it summons man to his final destiny.” What do you think Plato meant? Can you reflect on and share a time when you felt wounded by beauty in nature, and through that experience, felt a longing for God?
- 6 Read Job 38–40:2. What is God telling us about what we can know about the created world? Who knows all the answers, and why? Do you think this Scripture passage means we should not try to learn about the created world? Explain.

Answer Key

- 1 Accept reasoned answers.
- 2 Accept reasoned answers.
- 3 Students may say because of God's love for us or because they reflect God who is transcendent beauty. They may point to evolutionary processes that have beautifully adapted living things to their environment. If students respond with strictly biological processes, ask them to consider why some things are alive and some are not. How does evolution account for the creation of living things? For the increasing complexity of living things? Or for the differences between animals which lack self-consciousness, and humans, who have it? (Note: it can do none of these things). Ultimately, the answer to why they are all so beautiful lies in the One who created them. The beauty of nature bears witness to God.

- 4 Any process that results in an increased complexity or adaptability of the organisms to their environment cannot be done all by itself. In the same way that other events where we see a product that is superior to its previous form, this increased complexity requires a cause – a purposeful input of energy and intelligence. (This is the connection to entropy.)
- 5 When we experience the beauty of nature and are attentive to the movements of our soul, we find that we have a longing for even greater beauty. Beauty wounds us, because we long to be in the presence of ultimate Beauty, God Himself. Accept reasoned answers.
- 6 Our knowledge is limited compared to God, who created all, defined the limits of all created things, and gave everything its purpose and power. This Scripture does not mean we should not try to learn what we can about the natural world, but it is good to maintain a humble awareness of the limits of knowledge we are even capable of attaining, and the proper attitude of wonder and awe we should have for the Creator (Fear of the Lord) as well as reverence for His creation.

HANDOUT A

What Questions Are Raised by God's Existence?

Chapter 3 Overview

So far in this unit we have shown that science, reason, and philosophy are enough to know God exists. So now we will turn to some questions raised by God's existence. For example, can we use reason to prove God does not exist? Do science and the Bible conflict? Can you believe in evolution and still be a Christian? And since there is so much evidence for God, why do we need Faith? We will explore these and other questions in this chapter.

In this chapter you will learn that ...

- The existence of God cannot, in principle, be rationally disproved.
- To know more about who God is, we must turn to revelation.
- There is no real conflict between the truths of science and the truths of faith.
- The story of creation in the Book of Genesis was not written as a scientific explanation of the creation of the world, even though there are incidental points of intersection.
- As long as certain truths about creation are maintained, Catholics are free to believe that evolution is a viable theory.
- Most reasons people give for doubting God's existence lack a reasonable basis and can easily be refuted.

Bible Basics

Then God said, "Let us make man in our image, after our likeness; ... So God created man in his own image, in the image of God he created him; male and female he created them.

—*Genesis 1:26–27*

[T]hen I saw all the work of God, that man cannot find out the work that is done under the sun. However much man may toil in seeking, he will not find it out; even though a wise man claims to know, he cannot find it out.

—*Ecclesiastes 8:17*

Connections to the Catechism

- CCC 154–159
- CCC 274
- CCC 282–289
- CCC 2123–2128
- CCC 2293–2294

Chapter 3

Moving from What to Who

A keen mind once observed, “In the mystical pursuits of the spirit, the light beckons ahead and the purpose surging in our nature responds.”

Who would you guess made this observation?

A spiritual director?

A trendy self-improvement guru?

The person who made this observation is Sir Arthur Eddington, the astrophysicist known for verifying the expansion of the universe, whom we read about in Chapter 3. This accomplished scientist believed that the purpose or drive inside each of us that leads us to seek the divine comes from God Himself.

Science has the same goal as religion: to understand the world as it really is. Science approaches this goal by studying the natural world and is, by definition, closed off to the supernatural. Therefore, perhaps no one better than a scientist can tell us of the need to go beyond science when seeking truth.

For now, let us continue using only our reason to discover who God is, until we can go no further.

- ▼ Greek philosopher Aristotle described the law of non-contradiction – the principle that two contradictory propositions cannot both be true – in his work *Metaphysics*.



The School of Athens, by Raphael.

From the proofs we studied last chapter, we know that there is First Mover, a First Efficient Cause and Necessary Being, one reality whose very being is existence itself and whose act of consciousness or thinking that is the ultimate cause of the existence and intelligibility of everything else there is, which we can call God. We also learned in Chapter 2 that there is something in our souls that moves us to desire perfection. These perfections we seek – the transcendental desires of perfect love, perfect truth, perfect justice/goodness, perfect beauty, and perfect being/home – are realized in God. God is love, truth, justice, beauty, and being. But with respect to who God is, reason can go no further. If we want to know more, we will have to turn to revelation, which we will begin to do in Unit 3. For now, let us consider some questions raised by God’s existence. Since we have used rational arguments thus far to demonstrate the reasonableness of belief in God, it is natural to ask if we can use reason to prove God does not exist.

Can the Existence of God be Disproved?

It is simple to use observations and other **empirical evidence** (*a-posteriori* evidence, which is Latin for “from the later”) to prove that something exists. For example, to prove that dogs exist, we need only have one confirmed sighting of a dog. However, to use this method to prove a negative – that something does not exist – is basically impossible, since one must exhaustively search everywhere to confirm that the thing is nowhere to be found. We cannot prove, for instance, that unicorns do not exist – we can instead only be sure that no one has discovered evidence of their existence. If we tried to disprove God by this method, we would not only have to search our entire universe, but the whole of reality beyond our universe (which we cannot currently do and may not, in principle, ever be able to do).

Another method we could use is the **Law of Non-Contradiction** (an example of *a priori* evidence, which is Latin for “from the earlier.” *A priori* knowledge comes from the use of reason and deduction rather than from empirical observation.). The Law of Non-Contradiction dictates that any intrinsic contradiction is impossible, and therefore, false. For example, we know that a book cannot be green and blue at the same time. We know that there are no squares that are also circles. Again, this is something we know intuitively, even if we have never sat down to think about it. Can we use this method to show that God is not real? No, we cannot, because God is unrestricted – His very essence is being itself; He is the Unmoved Mover, the Uncaused Cause, the only

Empirical Evidence:

Information acquired by observation or experimentation.

Law of Non-Contradiction:

Philosophical principle that any logical contradiction is impossible; a proposition cannot be both true and false at the same time.

.....

Deism: The belief that an all-powerful god created the universe but is not actively involved in sustaining it.

Necessary Being. Therefore, no finite reality can contradict Him. The only way to attempt to disprove God is to claim that He is restricted and non-transcendent – in which case He would no longer be God. Hence God cannot, in principle, be rationally disproved.

If There Is So Much Evidence for God, Why Do We Need Faith?

You may now be wondering, if there is so much evidence for believing in God, why do we need faith at all? This is a valid question. To be sure, one can be convinced God exists based purely on reason. **Deists**, for example, generally come to their belief in a creator through reason alone. But, as we have learned, reason is limited in what it tells us about who God is. Historically, thinkers who followed the logical proofs about God knew that He was a Creator, but they had no way of knowing if He cared about His creation. Therefore many of them concluded that He was distant and indifferent, rather than a God of unconditional love, and missed the chance to truly grasp the meaning of our lives.

- ▶ Deists believe in God. They think of the Creator as a distant clock-maker who created the world, but then left it to run on its own without further intervention by Him. Famous deists include Voltaire and Benjamin Franklin.



Shutterstock image.

As we will see, God cares deeply for us. He is not simply a What, but also a Who. Science and reason can tell us that God is a unique uncaused Creator of everything and is capable of unrestricted thinking, but they cannot tell us that He loves us, cares for us, answers our prayers, guides us, protects us, and inspires us. The only way we can know this is through God's own self-revelation. God is calling us to a life with Him and gives us freedom so that we have the power to choose whether to answer that call. The evidence of reason allows us to build a bridge of understanding to God, and there are reasons it is rational to trust in God's revelation. Ultimately, however, when confronted with the evidence, it takes a personal act of faith to believe in Him.

The need for a personal response to God's invitation means rational proofs will never be enough without a free choice to believe. Though agnostics do not deny God's existence, atheists, a much smaller group, do. One of the most popular reasons for a rejection of God is the idea that religion and science conflict. In reality, Faith and science cannot be in conflict, for they come from the same source: the infinite mind and all-loving heart of God. As we have seen, as Catholics we have no reason to disbelieve legitimately established scientific facts and theories.

The Bible and Science

The most common example given for the idea that the Bible conflicts with science is the age of the universe. Some think the Bible says it is less than 10,000 years old, while science says it is about 13.8 billion years old. The view that the world is less than 10,000 years old is called **Young Earth Creationism**. In this view, the age of the world is calculated by adding the ages of the people in the Bible from Abraham (who is pretty well established as living around 1800 BC) back to Adam. The misconception, then, is that any good scientist must disregard the Book of Genesis as unscientific, and any good Catholic must disregard contemporary scientific theories of creation as a contradiction of the Word of God. Nothing could be further from the truth! Catholics are free to believe various ages of the world/universe. There is much scientific evidence, however, for a much, much older universe that must be accounted for.

Pope Pius XII addressed the creation issue in his 1943 encyclical *Divino Afflante Spiritu*. The pope explained that there are two approaches to creation and the understanding of nature: first, the Bible – which reveals sacred truths necessary for salvation. And second, science – which uses an empirical-mathematical method to give descriptions and explanations of the physical world.

Young Earth Creationism:

The view that the world is less than 10,000 years old, calculated by adding the ages of the people in the Bible from Adam to Abraham, whose date is established at about 1800 BC.

Catholics are free to believe various ages for the world. There is much scientific evidence, however, for a much, much older universe that must be accounted for.

Far from feeling threatened by the pursuit of scientific truth, the Catholic Church has a long history of interested involvement in the development of science.

The Bible is the inspired word of God, but Pius XII makes an important clarification that the Bible was not dictated by God with the human author recording the transcription. Instead, God inspired each human author, who contributed his own thought patterns, cultural perspectives, and so forth to the formation of the text. This process of inspiration allowed the truths God wanted known for the sake of salvation to be communicated to each human author's audience in an intelligible way. What were these truths? That everything in the world was created by the one God, that this creation is good, and that man was specially created in God's image and likeness. At the time Genesis was written, its Israelite audience was surrounded by cultures that had a very different origin story, where the rivers and stars and stones of creation were themselves gods—cruel gods that treated humanity as disposable—and the material world itself was frequently seen as evil. Avoiding these distortions was the priority in God's creation account. Thus, details like the six days of creation from Genesis 1 were a means of telling this story (by conveying distinct stages in creation), rather than presenting a scientific explanation of universal creation.

Far from feeling threatened by the pursuit of scientific truth, the Catholic Church has a long history of interested involvement in the development of science. For example, Nicholas Copernicus, a Catholic cleric, developed the heliocentric (sun-centered) model of the solar system. Fr. Gregor Mendel, an Augustinian monk and abbot, is the founder of modern genetics. Nicolas Steno, a Danish Catholic bishop, was one of the founders of modern stratigraphy and geology. And, of course, Fr. Georges Lemaître was the founder of contemporary cosmology after originating the Big Bang Theory in 1927.

While there are some intriguing incidental points of intersection between the biblical account and modern science (the creation of light on the first day, before the sun, moon and stars are formed, is certainly suggestive of the Big Bang), these are secondary to God's main purpose in the Bible: conveying sacred truths for salvation. As long as we let the Bible be salvific and let science be descriptive and explanatory of the physical universe, we need not worry about the seeming contradictions, because faith and science are explaining two different viewpoints. But if we try to force the biblical author to be a scientist or try to force scientists to give truths of salvation, we will find ourselves in a world of confusion.



Pope Pius XII, by Luis Fernández García

- ◀ Pope Pius XII explained in his 1950 encyclical *Humani Generis* that Catholics are free to consider evolution a scientifically valid theory of biological processes.

Evolution and the Church – Is There a Conflict?

Evolution is sometimes seen in the popular culture as an alternative to creation, and there is a sense among many that evolution conflicts with Church teaching. Evolution as a theory, however, deals with how species develop, and does not actually speak to the questions of how the universe began, where the fine-tuning of the material conditions came from, nor the other cosmological questions that we discussed earlier in the proofs for God's existence.

While there might be a perceived conflict in scientific details between the account of Creation in Genesis and the account that evolution gives for how various life forms originated, as we discussed above, however, the Biblical account is focused on sacred truths and is not intended to be scientifically exhaustive. Pope Pius XII, in his 1950 encyclical *Humani Generis*, explained the particular truths that Catholics must hold regarding creation: we cannot deny the creation by God of a unique soul in every human being; a soul is not physical; it has no

.....

Naturalism: The notion that we cannot entertain a supernatural reality until every natural reason for physical reality has been exhausted.

biological aspects and so it is not subject to an evolutionary process. (In other words, whatever process may account for the physical development of human beings, we cannot say that the soul was produced by these same processes.)

Provided these truths are maintained, Catholics are free to consider evolution as a scientifically valid theory. Whether seeking truth from the perspective of science, or from theology, or both, we should not expect the truths of Faith and science to conflict with each other.

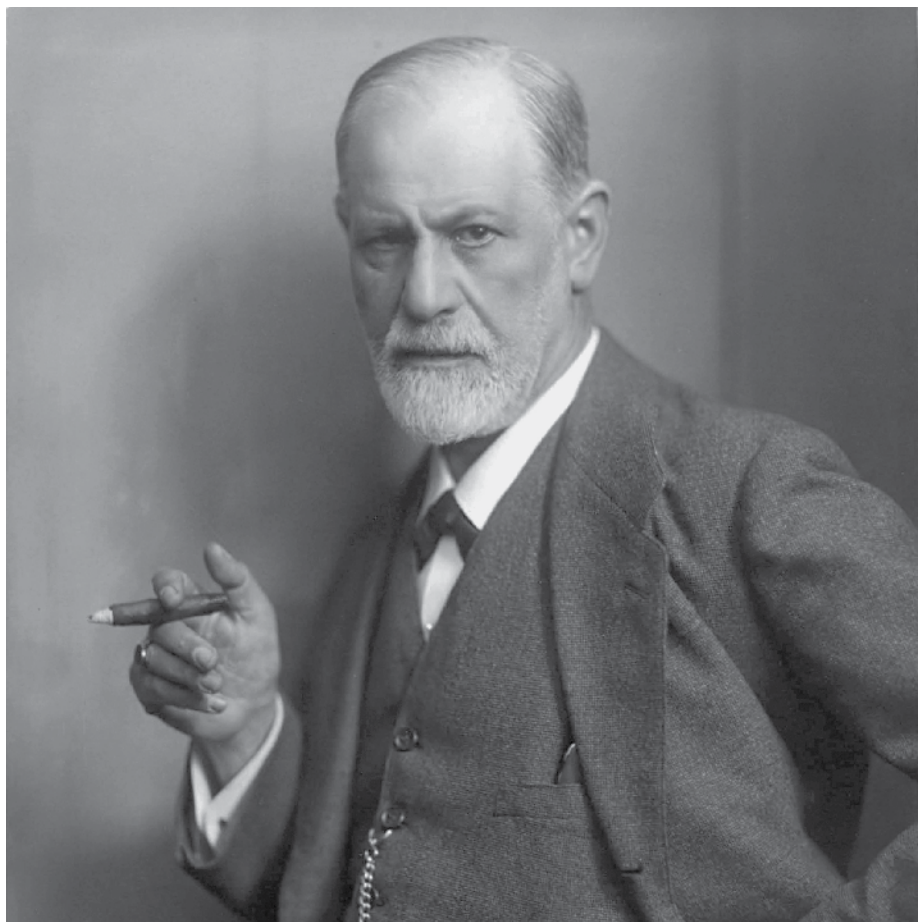
Common Reasons People Doubt God's Existence

It may be helpful now to briefly turn to some other common reasons people doubt God's existence:

Agnosticism and Naturalism

A scientific motive that can often lead to agnosticism is **naturalism** – the notion that we cannot entertain a supernatural reality until every natural reason for physical reality has been exhausted. However, as the great

- ▶ Father of psychoanalysis Sigmund Freud believed religion was a form of wishful thinking, and notably chose atheism on this account.



Photographic portrait of Sigmund Freud, by Max Halberstadt.

astrophysicist Sir Arthur Eddington observed, there are many realities that go beyond what can be observed in nature – transcendentals like goodness, beauty, and love, as well as the domain of mysticism and the spiritual. If we are not open to these transcendental realities, we would artificially limit our human experience and therefore our purpose in life and fulfillment.

Suffering

In our own lives, the lives of our friends and loved ones, and on the news, there is no denying that innocent people suffer. Christianity charts a path to find positive meaning in suffering, which we will discuss in the last unit of this course. Because some do not understand or even know about this meaning, they conclude that suffering means God does not love us. Sadness or resentment may drive them to reject God. Some even conclude that suffering is a sure sign God does not exist. However, Christianity teaches that there is genuine purpose in suffering, leading to a purification of our love and faith. If this teaching is true, then suffering may well be consistent with the God of love and even part of His plan. We will delve more deeply into this objection to the existence of God in Unit 7.

The Rejection of Moral Authority Beyond the Self

For some, the desire to avoid being answerable to any higher authority – a desire popularized by 19th century German philosopher Friedrich Nietzsche as a “will to power” – leads them to embrace atheism. As with suffering, this rejection has an emotional motivation, rather than coming from a careful review of evidence for or against the existence of God. If we have no objection to being answerable to a higher moral authority, however, then the all-knowing and all-loving God can be our guide to the perfection of love and to eternal joy in His kingdom.

Wanting to Avoid Wishful Thinking

The idea that religion is a naive fantasy or wishful thinking can lead people to embrace atheism in a desire to be authentic. They assert that being an atheist means they have the integrity to face reality. Sigmund Freud, the well-known and influential late 19th and early 20th Century founder of psychoanalysis, is a notable example of someone who chose atheism on this account. His similarly influential student Carl Jung (who was mentioned in Chapter 2) dissented, saying the human inclination to religion was driven by a sense of God’s presence within us.

The possible existence of aliens need not cause us to question our belief in God.

Historical Revisionism

Historical revisionism, or the manipulation of historical facts in order to advance a narrative, drives some to atheism. Karl Marx's work is a perfect example of this. Marx – the 19th Century political philosopher and father of Communism – saw all history as class struggle. He argued that Christianity was a tool to distract and control the working class. If they were comforted by the promise of a better life in the hereafter, his thinking went, they would not revolt in this life. For this reason, Marx called religion "the opiate of the masses." The truth is, however, that Christianity has been central to many advances in social justice in fields like education, social welfare, and healthcare. The 1891 encyclical *Rerum Novarum* written by Pope Leo XIII explores many of these topics.

A View of God as Harsh and Hateful

Sometimes, sadly, children are introduced to God as a harsh, demanding, even hateful figure. Though it flatly contradicts God's own self-revelation as the loving Father of the Prodigal Son, this fear-inducing introduction often stays with people through adulthood, leading them to avoid both God and religion.

The Question of Alien Life

Before closing out this chapter, let us look at a final, out of this world reason some have for rejecting belief in God: the possibility of alien life. Given the many trillions of stars in our universe's billions of galaxies, it seems likely that a certain number of planets would have conditions favorable to life. It also seems likely that finding such life, if it exists, will remain far outside our scientific powers of observation for some time.

For the present, we can only speculate about the possible existence of life elsewhere in the universe, including the possibility of intelligent life (life that has a transphysical soul, experiences the five transcendental desires, and so on.) Their possible existence need not cause us to question our belief in God! As with the creation of humans, we must assume that the creation of such intelligent beings would have to involve direct creation by God of their souls. We must also assume that such beings would be invited to the same relationship with God as we are, and that they would be beneficiaries, like we are, of the Son of God's salvific sacrifice.

We have now reached the end of our exploration of evidence for a soul and for God's existence and touched briefly on some of the reasons commonly put forth for disbelief. If we want to know more about God – who He is, and what He wants for us – we must turn to divine revelation, which we will do in the next unit.

Focus and Reflection Questions

- 1 What is the shared goal of both science and religion?
- 2 What is a-posteriori evidence? Why can't it be used to disprove God's existence?
- 3 What is the Law of Non-Contradiction? How does it show that God cannot, in principle, be rationally disproved?
- 4 Why is it not enough to come to knowledge of God's existence by reason alone?
- 5 Why can't faith and science be in actual conflict with one another?
- 6 What two approaches did Pope Pius XII suggest we use to approach understanding creation and nature?
- 7 What truths about creation are revealed to us in the Bible through the process of inspiration? Why?
- 8 What are Catholics obligated to believe regarding creation? Providing these truths are maintained, what can Catholics believe regarding the theory of evolution?
- 9 What is naturalism? Why is it a limiting approach to our understanding of the world?
- 10 What does Christianity teach about suffering?
- 11 How does Christianity disprove the claim of Communism that Christianity is a tool to distract and control the working class?
- 12 Why isn't the possibility of intelligent alien life an obstacle to belief in God?

Straight to the Source

ADDITIONAL READINGS FROM PRIMARY SOURCES

***Divino Afflante Spiritu* 1, an Encyclical Letter of Pope Pius XII, September 30, 1943**

1. Inspired by the Divine Spirit, the Sacred Writers composed those books [of Sacred Scripture], which God, in His paternal charity towards the human race, deigned to bestow on them in order "to teach, to reprove, to correct, to instruct in justice: that the man of God may be perfect, furnished to every good work." This heaven-sent treasure Holy Church considers as the most precious source of doctrine on faith and morals. No wonder therefore that, as she received it intact from the hands of the Apostles, so she kept it with all care, defended it from every false and perverse interpretation and used it diligently as an instrument for securing the eternal salvation of souls, as almost countless documents in every age strikingly bear witness. In more recent times, however, since the divine origin and the correct interpretation of the Sacred Writings have been very specially called in question, the Church has with even greater zeal and care undertaken their defense and protection. The sacred Council of Trent ordained by solemn decree that "the entire books with all their parts, as they have been wont to be read in the Catholic Church and are contained in the old vulgate Latin edition, are to be held sacred and canonical." In our own time the Vatican Council, with the object of condemning false doctrines regarding inspiration, declared that these same books were to be regarded by the Church as sacred and canonical "not because, having been composed by human industry, they were afterwards approved by her authority, nor merely because they contain revelation without error, but because, having been written under the inspiration of the Holy Spirit, they have God for their author, and as such were handed down to the Church herself." When, subsequently, some Catholic writers, in spite of this solemn definition of Catholic doctrine, by which such divine authority is claimed for the "entire books with all their parts" as to secure freedom from any error whatsoever, ventured to restrict the truth of Sacred Scripture solely to matters of faith and morals, and to regard other matters, whether in the domain of physical science or history, as "obiter dicta" and – as they contended – in no wise connected with faith, Our Predecessor of immortal memory, Leo XIII in the Encyclical Letter *Providentissimus Deus*, published on November 18 in the year 1893, justly and rightly condemned these errors and safe-guarded the studies of the Divine Books by most wise precepts and rules.

- 1 Why did God bestow Scripture on mankind?
- 2 What does Pope Pius XII say has been called into question about Scripture in more recent times?
- 3 What was the reason the Vatican Council declared the entirety of Scripture to be held sacred and canonical? Why do you think this point is important to make?

***Humani Generis* 36, an Encyclical Letter of Pope Pius XII, August 12, 1950**

36. The Teaching Authority of the Church does not forbid that, in conformity with the present state of human sciences and sacred theology, research and discussions, on the part of men experienced in both fields, take place with regard to the doctrine of evolution, in as far as it inquires into the origin of the human body as coming from pre-existent and living matter – for the Catholic faith obliges us to hold that souls are immediately created by God. However, this must be done in such a way that the reasons for both opinions, that is, those favorable and those unfavorable to evolution, be weighed and judged with the necessary seriousness, moderation and measure, and provided that all are prepared to submit to the judgment of the Church, to whom Christ has given the mission of interpreting authentically the Sacred Scriptures and of defending the dogmas of faith. Some however, rashly transgress this liberty of discussion, when they act as if the origin of the human body from pre-existing and living matter were already completely certain and proved by the facts which have been discovered up to now and by reasoning on those facts, and as if there were nothing in the sources of divine revelation which demands the greatest moderation and caution in this question.

- 1 What does Pope Pius XII clarify that the Teaching Authority of the Church does not forbid?
- 2 How does he qualify his statement about research and discussion of the doctrine of evolution (what must be the foundation of research and discussion)?
- 3 According to Pope Pius XII, in what way do many people “transgress” this liberty of discussion about the doctrine of evolution?

***Fides et Ratio* 5, an Encyclical Letter of Pope St. John Paul II, September 14, 1998**

5. On her part, the Church cannot but set great value upon reason’s drive to attain goals which render people’s lives ever more worthy. She sees in philosophy the way to come to know fundamental truths about human life. At the same time, the Church considers philosophy an indispensable help for a deeper understanding of faith and for communicating the truth of the Gospel to those who do not yet know it.

Therefore, following upon similar initiatives by my Predecessors, I wish to reflect upon this special activity of human reason. I judge it necessary to do so because, at the present time in particular, the search for ultimate truth seems often to be neglected. Modern philosophy clearly has the great merit of focusing attention upon man. From this starting-point, human reason with its many questions has developed further its yearning to know more and to know it ever more deeply. Complex systems of thought have thus been built, yielding results in the different fields of knowledge and fostering the development of culture and history.

Anthropology, logic, the natural sciences, history, linguistics and so forth—the whole universe of knowledge has been involved in one way or another. Yet the positive results achieved must not obscure the fact that reason, in its one-sided concern to investigate human subjectivity, seems to have forgotten that men and women are always called to direct their steps towards a truth which transcends them.

Sundered from that truth, individuals are at the mercy of caprice, and their state as person ends up being judged by pragmatic criteria based essentially upon experimental data, in the mistaken belief that technology must dominate all. It has happened therefore that reason, rather than voicing the human orientation towards truth, has wilted under the weight of so much knowledge and little by little has lost the capacity to lift its gaze to the heights, not daring to rise to the truth of being. Abandoning the investigation of being, modern philosophical research has concentrated instead upon human knowing. Rather than make use of the human capacity to know the truth, modern philosophy has preferred to accentuate the ways in which this capacity is limited and conditioned.

This has given rise to different forms of agnosticism and relativism which have led philosophical research to lose its way in the shifting sands of widespread skepticism. Recent times have seen the rise to prominence of various doctrines which tend to devalue even the truths which had been judged certain. A legitimate plurality of positions has yielded to an undifferentiated pluralism, based upon the assumption that all positions are equally valid, which is one of today's most widespread symptoms of the lack of confidence in truth. Even certain conceptions of life coming from the East betray this lack of confidence, denying truth its exclusive character and assuming that truth reveals itself equally in different doctrines, even if they contradict one another. On this understanding, everything is reduced to opinion; and there is a sense of being adrift. While, on the one hand, philosophical thinking has succeeded in coming closer to the reality of human life and its forms of expression, it has also tended to pursue issues—existential, hermeneutical or linguistic—which ignore the radical question of the truth about personal existence, about being and about God. Hence we see among the men and women of our time, and not just in some philosophers, attitudes of widespread distrust of the human being's great capacity for knowledge. With a false modesty, people rest content with partial and provisional truths, no longer seeking to ask radical questions about the meaning and ultimate foundation of human, personal and social existence. In short, the hope that philosophy might be able to provide definitive answers to these questions has dwindled.

- 1 According to Pope St. John Paul II, how does the Church view philosophy?
- 2 According to the pope, what vital investigation has modern philosophical research abandoned? What investigation has philosophical research instead turned to?
- 3 What has this shift in philosophical research led to? Give an example.
- 4 What does the pope say most people "rest content with"? What kinds of questions have been abandoned because of this "false modesty" in society?

Science and Theology Venn Diagram

Directions: Complete the Venn diagram by putting each item in the proper space. Consider what each discipline uses as it seeks to understand the universe as it really is.

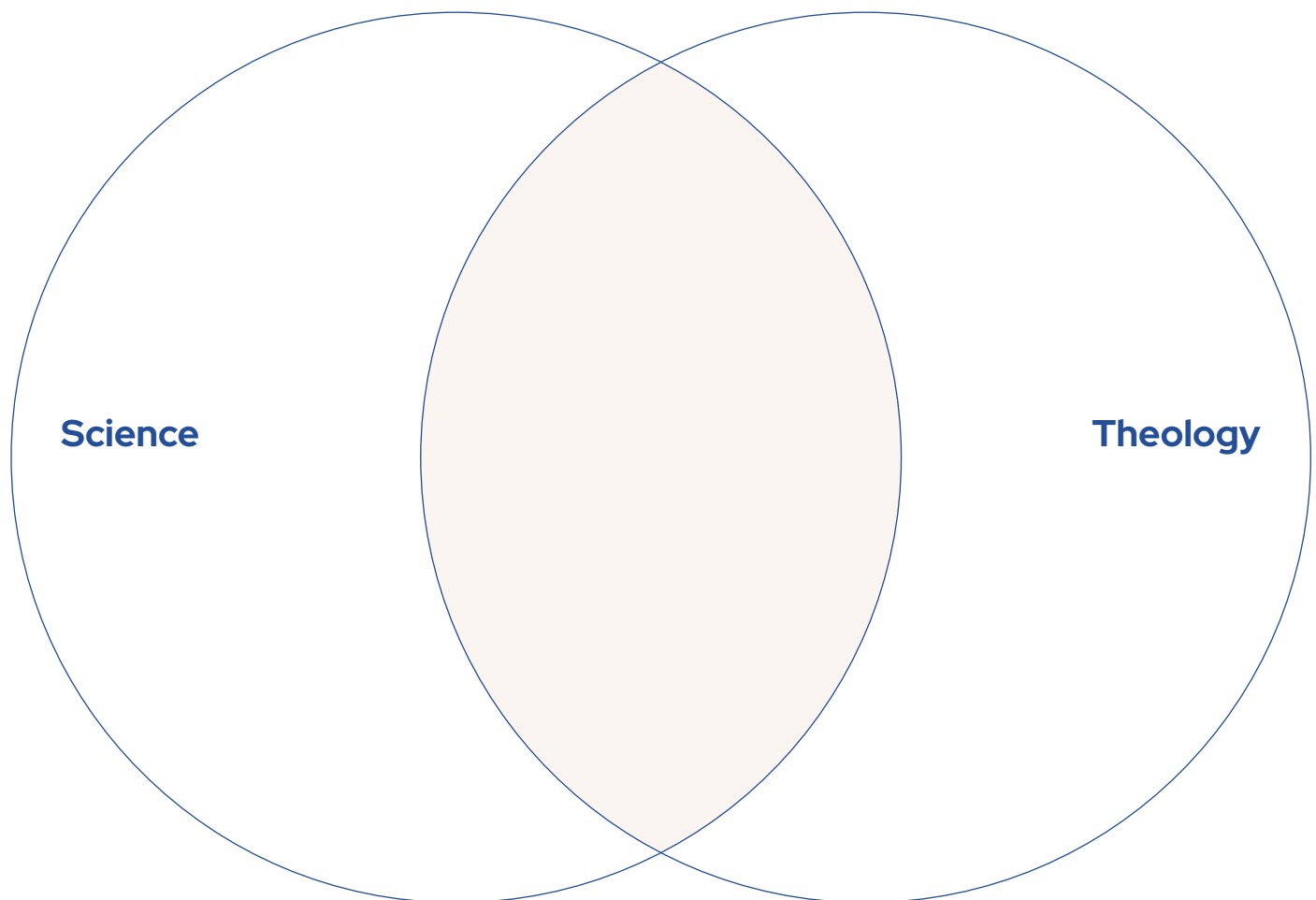
Word Bank

Experimentation
Logic

Reason
Divine Revelation

Apostolic Tradition
Observation

Mathematics
Measurement



Why Does God Reveal Himself?

Directions: First, watch the video titled “Why Does God Reveal Himself?” Then, answer the questions.

- 1 What reasons does the video give for why God reveals Himself to us?

- 2 St. Thomas Aquinas said, “*Bonum diffusivum sui*,” Latin for, “The good is diffusive of itself.” Love wants the other to share in his own happiness. Describe a time this was true for you. What was it like to share your happiness with another?

- 3 The video concludes that man can only love what he knows. What would you say to someone who said that theology class should just be about learning to love God, and not knowing about Him? What would you say to someone who says theology class should just be about learning about God?

- 4 Despite all the evidence from science and human reason, and despite His gift of self-revelation, some people still do not believe in God. The chapter text addresses several common reasons people give for doubting God’s existence. Choose one of the reasons given in the chapter and write a brief response to someone who might give that reason for their lack of belief.

What Questions Are Raised by God's Existence

True-False

Directions: Read each statement and write T for true or F for false. If the statement is false, correct it by writing on the line what should replace the **bolded** word/s to make it a true statement.

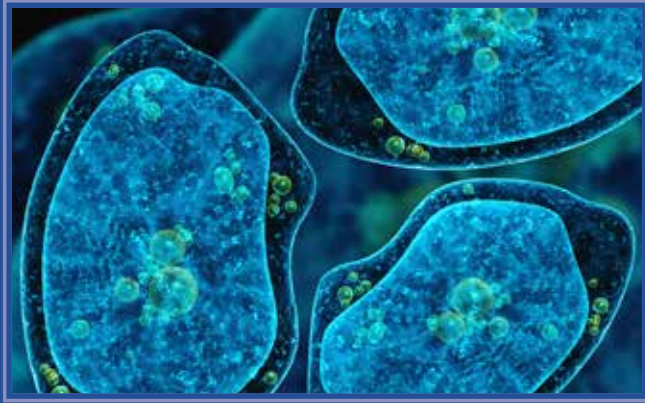
- _____ 1 Science has the same goal as religion: to understand the world **as it really is**. _____
- _____ 2 Because of our environment, humans **could have** evolved to develop a desire for perfection.

- _____ 3 Using **reason alone**, we can know there is one creator who is the source of transcendental love, truth, beauty, and goodness. _____
- _____ 4 The existence of God **can** be disproven. _____
- _____ 5 Historically, many thinkers who used only logical proofs to learn about God concluded that He was **distant and indifferent**. _____
- _____ 6 **Atheists** say they cannot be sure whether or not God exists, while **agnostics** assert He does not exist. _____
- _____ 7 Pope Pius XII addressed the creation issue in his encyclical ***Deus Caritas Est***.

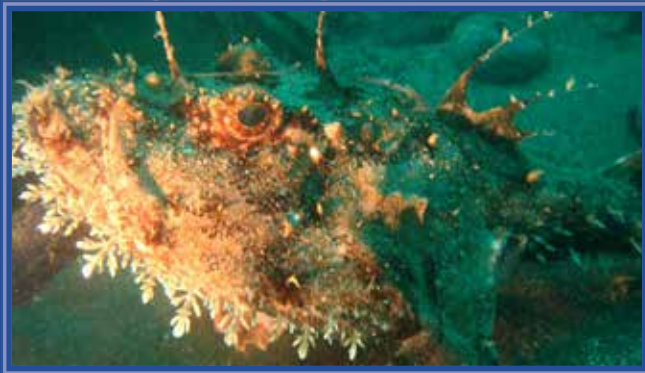
- _____ 8 In his encyclical *Humani Generis*, Pope Pius XII explained that Catholics believe in the creation by God of **a unique soul** in every human being.

- _____ 9 As long as certain truths regarding creation are maintained, Catholics **are not free** to consider evolution as a scientifically valid theory. _____
- _____ 10 Sigmund Freud asserted that believing in God was **just wishful thinking**. _____
- _____ 11 Given the many trillions of stars in our universe's billions of galaxies, it seems **likely** that a certain number of planets would have conditions favorable to life. _____
- _____ 12 The possible future discovery of alien life in the universe **must cause us to reevaluate** our belief in God. _____

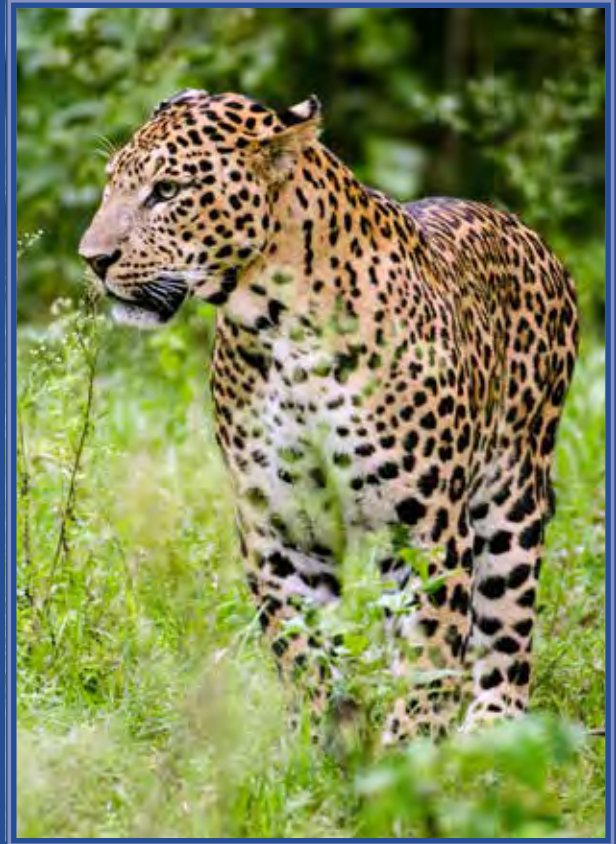
Wonders of Nature: Biodiversity



Three amoebas. Image courtesy Shutterstock.



Monkfish. Image courtesy SUBnormali Team.



Male Indian leopard. Image courtesy Srikaanth Sekar.



Purple Orchid Flower. Image Courtesy Lawanga Ranwala

Wonders of Nature: Biodiversity

Directions: Take a few moments to observe the images on the previous page and think about the images of different organisms you and your classmates brought in for today's class. Then, discuss the following questions with a partner or two.

- 1** You just completed an activity about organisms that had not been known to you and your classmates before. Which organism was the most memorable to you, and why?
- 2** Even biologists themselves do not know every species that exists – or even how many there are. Biologist Robert May explained in 2010 in the journal *Science*: “We could defend numbers exceeding 100 million, or as low as 3 million.” Have you ever thought about the incredible variety of living things in the world (also known as biodiversity)? Why do you think biologists do not know how many different living things there are in the world?
- 3** An even greater mystery than how there is such great diversity is why! Why do you think there are so many different types of living things? Why do you think are they all so beautiful, in their own unique way?
- 4** How would you connect the adaptation of species to their environment to what we have learned in this unit about entropy (hint: Do systems left to themselves become more orderly and complex, or less orderly?) and about the need for a first cause?
- 5** Pope Emeritus Benedict XVI quoted Plato as saying, “The beautiful wounds, which is exactly how it summons man to his final destiny.” What do you think Plato meant? Can you reflect on and share a time when you felt wounded by beauty in nature, and through that experience, felt a longing for God?
- 6** Read Job 38–40:2. What is God telling us about what we can know about the created world? Who knows all the answers, and why? Do you think this Scripture passage means we should not try to learn about the created world? Explain.

Teacher Notes

Teacher Notes

Teacher Notes

Teacher Notes

Teacher Notes