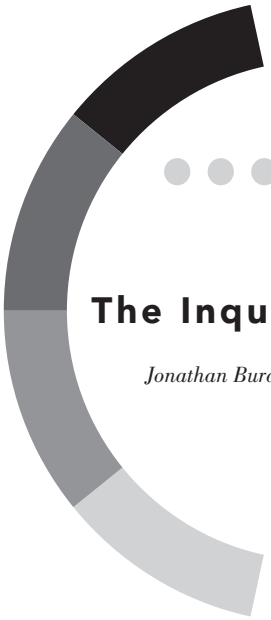

The Inquiry Arc in U.S. History

Jonathan Burack

Galileo's Crime

MindSparks®
CULVER CITY, CALIFORNIA
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The Early Modern Age

MindSparks®
CHALLENGING STUDENTS TO THINK HISTORICALLY

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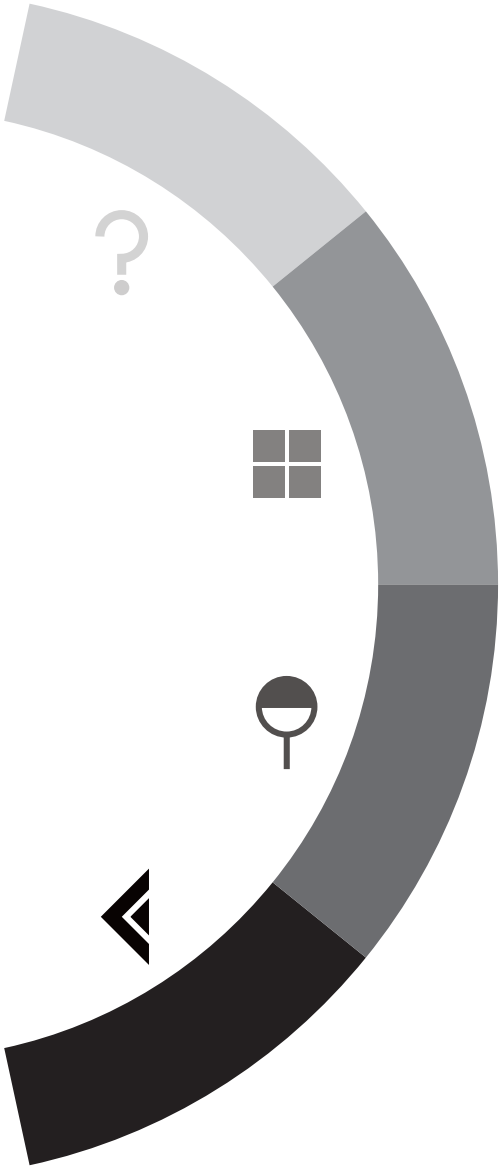
Contents

Introduction

C3 Framework

This book is based primarily on the College, Career, and Civic Life (C3) Framework for Social Studies Standards. This C3 Framework is an effective tool offering guidance and support for rigorous student learning. The assignments encourage students to be active participants in learning and to explore the parts of history that they find most compelling. Central to the C3 Framework and our use of it is its Inquiry Arc—a set of four interrelated dimensions of informed inquiry in social studies. The lessons in this book are based on all four dimensions of the C3 Inquiry Arc. While the C3 Framework analyzes each of the four dimensions separately, they are not entirely separable in practice—they each interact in dynamic ways. As a result, the lessons combine some or all of the dimensions in various ways.



Four Dimensions of the Inquiry Arc

1 **Developing compelling and supporting questions and planning inquiries**

Questions shape social studies inquiries, giving them broader meaning and motivating students to master content and engage actively in the learning process.

2 **Applying disciplinary concepts and tools**

These are the concepts and central ideas needed to address the compelling and supporting questions students pose. The C3 Framework stresses four subject fields: history, civics, economics, and geography. Each lesson addresses all of these disciplines.

3 **Evaluating sources and using evidence**

The purpose of using primary and secondary sources as evidence is to support claims and counterclaims. By assessing the validity and usefulness of sources, including those that conflict with one another, students are able to construct evidence-based explanations and arguments.

4 **Communicating conclusions and taking informed action**

While this may take the form of individual essays and other writing assignments, these lessons stress other kinds of individual and collaborative forms of communication, including debates, policy analyses, video productions, diary entries, and interviews. Meaningful forms of individual or collaborative civic action are also incorporated into each lesson.

How to Use This Book

This book offers you the chance to implement the entire C3 Inquiry Arc in brief, carefully structured lessons on important topics in world history. Each lesson is driven by a central compelling question, and disciplinary supporting questions are provided. Each lesson asks students to apply understandings from all of the C3 disciplines—history, civics, economics, and geography—and each lesson includes individual and group tasks in an integrated way.

Each lesson also includes an introductory essay, detailed teaching instructions, a packet of primary and secondary sources, and the handouts needed to implement the lesson's assignments. Rubrics for student evaluation and sources for further study are also provided. The teaching instructions suggest a time frame for completion of each lesson, but the assessments can easily be adapted to fit into any lesson plan.

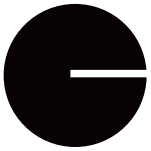
Each lesson is aligned with several C3 Framework standards and Common Core State Standards. The College and Career Readiness Anchor Standards for Literacy emphasize the reading and information texts, making these lessons ideal for integration into English Language Arts instruction.

C3 Disciplines

History

Civics

Economics



Geography

Galileo's Crime

Why Did the Church Put Him on Trial?

Overview

Introduction

On June 22, 1633, Galileo Galilei was brought before the Congregation of the Holy Office of the Inquisition of the Catholic Church. On that day, he was found guilty of "vehement suspicion of heresy." The Inquisition then gave the aged scientist two choices: he could "abjure, curse and detest" his views, or he could be burned at the stake. Galileo told the officials the following:

> I have been judged vehemently suspected of heresy, that is, of having held and believed that the Sun is the center of the universe and immoveable, and that the Earth is not the center of the same, and that it does move. Nevertheless, wishing to remove from the minds of your Eminences and all faithful Christians this vehement suspicion reasonably conceived against me, I abjure with sincere heart and unfeigned faith, I curse and detest the said errors and heresies

Obviously, Galileo was right that the earth moved and that it was not the center of the universe. So why did he reject his own views about this? More importantly, why did the Church put him on trial in the first place? This last question is the compelling question this lesson will focus on. Students will work with nine primary sources and one secondary source that form the core content for tasks that will help them answer the lesson's compelling question.

Objectives

Students will work individually and in small groups to respond in a meaningful way to a compelling question about the trial of Galileo. They will apply discipline-specific background knowledge, use scaffolding, and engage in instructional activities to interpret primary and secondary sources before presenting their ideas to the class.

C3 Standards Addressed by This Lesson

- **D1.4.6-8.** Explain how the relationship between supporting questions and compelling questions is mutually reinforcing.
- **D1.5.6-8.** Determine the kinds of sources that will be helpful in answering compelling and supporting questions, taking into consideration multiple points of view represented in the sources.
- **D2.HIS.5.6-8.** Explain how and why perspectives of people have changed over time
- **D2.HIS.11.6-8.** Use other historical sources to infer a plausible maker, date, place of origin, and intended audience for historical sources where this information is not easily identified.
- **D2.HIS.12.6-8.** Use questions generated about multiple historical sources to identify further areas of inquiry and additional sources.
- **D2.HIS.16.6-8.** Organize applicable evidence into a coherent argument about the past.
- **D2.CIV.8.6-8.** Analyze ideas and principles contained in the founding documents of the United States, and explain how they influence the social and political system.
- **D2.ECO.7.6-8.** Analyze the role of innovation and entrepreneurship in a market economy.

- **D2.GEO.5.6-8.** Analyze the combinations of cultural and environmental characteristics that make places both similar to and different from other places.
- **D2.GEO.6.6-8.** Explain how the physical and human characteristics of places and regions are connected to human identities and cultures.
- **D3.1.6-8.** Gather relevant information from multiple sources while using the origin, authority, structure, context, and corroborative value of the sources to guide the selection.
- **D3.2.6-8.** Evaluate the credibility of a source by determining its relevance and intended use.
- **D3.3.6-8.** Identify evidence that draws information from multiple sources to support claims, noting evidentiary limitations.
- **D3.4.6-8.** Develop claims and counterclaims while pointing out the strengths and limitations of both.
- **D4.1.6-8.** Construct arguments using claims and evidence from multiple sources, while acknowledging the strengths and limitations of the arguments.
- **D4.3.6-8.** Present adaptations of arguments and explanations on topics of interest to others to reach audiences and venues outside the classroom using print and oral technologies (e.g., posters, essays, letters, debates, speeches, reports, and maps) and digital technologies (e.g., Internet, social media, and digital documentary).
- **D4.6.6-8.** Draw on multiple disciplinary lenses to analyze how a specific problem can manifest itself at local, regional, and global levels over time, identifying its characteristics and causes, and the challenges and opportunities faced by those trying to address the problem.

Common Core Anchor Standards Addressed by This Lesson

- **CCSS.ELA-LITERACY.CCRA.R.1.** Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
- **CCSS.ELA-LITERACY.CCRA.R.2.** Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
- **CCSS.ELA-LITERACY.CCRA.R.6.** Assess how point of view or purpose shapes the content and style of a text.
- **CCSS.ELA-LITERACY.CCRA.R.9.** Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.
- **CCSS.ELA-LITERACY.CCRA.W.7.** Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
- **CCSS.ELA-LITERACY.CCRA.SL.1.** Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

Teaching Instructions

Compelling Question

Why did the Church put Galileo on trial?

Preparation

Provide all students with a copy of the Introductory Essay. Assign this reading as homework. In addition, assign all relevant parts of your course textbook or other basic reading material. Remind students to keep the compelling question for the lesson in mind as they read.

Asking Questions about the Trial of Galileo.

This part of the lesson stresses Dimensions 1 and 2 of the C3 Framework

Day One

1. Briefly discuss the Introductory Essay in class and address any initial questions students may have.
2. Distribute the How to Analyze a Primary Source handout. Review each suggestion with the class and remind students to refer back to the handout as they read the sources in this lesson.
3. Divide the class into four small groups. Each group will focus its work on one of the four basic disciplines identified in Dimension 2 of the C3 Framework—history, civics, economics, or geography. As they work, the groups should keep in mind the lesson's overall compelling question. However, for Day One and Day Two, each group will work mainly with a second compelling question—one related specifically to its assigned discipline.
4. Provide each group with one copy of its discipline-specific Assignment Sheet. Give each student a copy of all the sources for this unit. Each group may share a primary and secondary source packet, if necessary.
5. Have students complete the Day One section of their Assignment Sheets. The objective for Day One is for groups to read three sources, and then formulate one supporting question about each of those sources. The supporting questions should be recorded in the spaces provided on the Assignment Sheet.

Applying Disciplinary Concepts and Evaluating Sources and Evidence

This part of the lesson stresses Dimensions 2 and 3 of the C3 Framework

Day Two

6. Students will return to their previously assigned groups and formulate a claim addressing their group's compelling question. After reading the remaining seven sources, they will select one that supports their claim.

7. Using the evidence gathered from the sources, each group will then prepare a brief five- to ten-minute presentation about Galileo's trial from their group's disciplinary perspective. The presentation can be in the form of an oral report, a debate among group members, a PowerPoint, or a related type of presentation. Allow time for students to prepare by discussing and debating topics among themselves.

Day Three

8. Each group will deliver its presentation. Allow time for class discussion following each presentation, and for a final effort to answer the central compelling question for the lesson.

Communicating Results and Taking Action

This part of the lesson stresses Dimension 4 of the C3 Framework

Students will complete a final project that expresses an understanding of the topic and responds clearly to the lesson's central compelling question. The project may be completed in groups, but students should be evaluated individually.

Distribute the Communicating Results and Taking Action handout, and decide whether you will assign the projects or allow students to form groups and choose tasks on their own. Set a reasonable deadline. Students should review the Galileo's Crime Rubric so they can understand how their performance will be evaluated. The projects are summarized below.

Communicating Results

- Ask students to reread Primary Source 3.7. This is the passage in Galileo's *Dialogue Concerning the Two Chief Systems of the World* in which the character Simplicio states Pope Urban VIII's views about God's ability to shape the universe as he wished. This passage angered the pope. Rewrite the passage in a way that you think Pope Urban VIII would approve. Along with your rewrite of the passage, write a brief one- or two-page essay explaining why you believe your passage would have satisfied the pope and why Galileo could have accepted it as well.
- Ask each student to pretend to be a friend of Galileo. They have each been given a copy of Galileo's sketch of the moon (Primary Source 3.3). Have the students read Bellarmine's remarks in Primary Source 3.5. Their task is to send the sketch to Bellarmine and use it and their general knowledge of Galileo's case to write a long letter defending him and explaining why Bellarmine should allow him to continue to defend his views.
- Separate students into small groups. Each group's task is to discuss Galileo's complete letter to Benedetto Castelli in 1613 (see Primary Source 3.4). The complete letter can be accessed online at http://inters.org/Galilei-Benedetto-Castelli. Have the groups prepare a brief talk on the letter in which they share one passage they think adds important points other than the one expressed in Primary Source 3.4. Have each group share its list of additional points in a brief discussion with the class.

Taking Action

- In our age, a trial like the one Galileo endured is unlikely to occur. However, many scientific controversies often involve scientists in political conflict. Separate students into four small groups and ask each group to research controversies over one of the following issues: vaccinations, nuclear power, genetically modified organisms (GMOs), or climate change. Each group should prepare a brief presentation that defines the nature of the controversy, explains what the differing views among the scientists are, and summarizes the views of politicians and the public. Have the groups present their findings to the class and state their own views as to how the controversies they have identified might be resolved. Invite other students, parents, and community members to the presentations.
- Based on the work in the previous assignment, students should use PowerPoint or some other presentation software to create a summary report on the findings of the four groups. Use social media (Twitter, Facebook, etc.) to share this report with others. Invite people contacted in this way to comment and offer their own thoughts about one or more of the controversies discussed.

Introductory Essay

Galileo's Crime

A nineteenth-century painting depicting Copernicus viewing the heavens

On June 22, 1633, Galileo Galilei was brought before the Congregation of the Holy Office of the Inquisition of the Catholic Church. On that day, he was found guilty of "vehement suspicion of heresy." The Inquisition then gave the aged scientist two choices: he could "abjure, curse and detest" his views, or he could be burned at the stake. Galileo told the officials the following:

> I have been judged vehemently suspected of heresy, that is, of having held and believed that the Sun is the center of the universe and immoveable, and that the Earth is not the center of the same, and that it does move. Nevertheless, wishing to remove from the minds of your Eminences and all faithful Christians this vehement suspicion reasonably conceived against me, I abjure with sincere heart and unfeigned faith, I curse and detest the said errors and heresies.

Long before Galileo confessed to this "crime," someone else had already committed it. In 1543, the Polish astronomer and mathematician Nicolaus Copernicus published his sun-centered theory in *On the Revolutions of the Heavenly Spheres*. The book depicted the earth as orbiting a stationary sun annually while turning on its axis daily. This claim conflicted with several passages in the Bible. It was at odds also with the Greek philosopher Aristotle, long the Church's great authority on philosophy and science. Above all, Copernicus rejected the Earth-centered solar system described by Claudius Ptolemy in the 2nd century CE.

Ptolemy's system used perfect circles and many other devices to explain the apparent motions of the planets as seen from Earth. His Earth-centered system fit well with common sense. After all, we do not experience the earth moving. Wouldn't we all be thrown off it if it were? Still, it is not clear that Copernicus meant his sun-centered system to be taken as real. The preface to his book said it was only a simpler way to calculate the observed movements in the heavens. For a long time, the Church paid little attention to it.

Galileo, however, insisted that Copernicus's system was real. Moreover, he challenged Aristotle and Ptolemy in more basic ways. In 1610, Galileo used a new instrument, a telescope, to peer at the night sky. His discoveries backed up Copernicus. More importantly, they challenged an idea of great importance to the Church—that the heavens were a spiritual realm not like the ordinary matter making up the earth. The heavens were supposedly perfect—made of objects of pure light, traveling in perfect circles, held within invisible crystal spheres. Instead, Galileo observed rough mountain-like features on the moon. He saw four moons circling the planet Jupiter. He noticed sunspots—blemishes—on the surface of the sun. Heaven and Earth were both made of the same substances, it seemed. Both followed the same natural laws.

Galileo also dared to reinterpret Bible passages that conflicted with Copernican theory. He did this in 1613, in a long letter to a friend, Benedetto Castelli. Church officials were aware of this letter. It was a key reason for summoning Galileo to Rome in 1616 for his first confrontation with the Inquisition. Galileo was a highly respected scholar in Florence. He enjoyed the protection of Cosimo II de' Medici, the grand duke of Tuscany. Perhaps this is why he received fairly kind treatment in Rome in 1616. He was warned to stop advocating Copernican theory. However, it seems he was not forbidden from discussing it entirely. He did just that several times with Pope Urban VIII, with whom he was on friendly terms. The pope allowed him to write about Copernicus. However, he insisted that Galileo should not treat the theory as proven fact. He also insisted that Galileo make it clear that God is all-powerful and can design the universe in any manner he desires.

In 1632, Galileo published his views in the form of a discussion by three fictional individuals—his *Dialogue Concerning the Two Chief Systems of the World*. Galileo decided to include the pope's views. But he did so only briefly and in a way that almost seemed to mock the pope's concerns. This angered the pope. He was under many other sorts of pressure as well at that time. The Protestant threats to Church authority were at a high point. The massively violent Thirty Years' War had entered a dangerous phase for the Church. Due to mentioned pressures, the pope may have feared he would look weak if he failed to put Galileo on trial. In other words, inaction might have made the Church seem unwilling to stand up for its beliefs. And so, Galileo was tried and found guilty.

This outcome can be seen as a great tragedy for the Church. Galileo was part of a growing scientific revolution that would alter history. He was also a devout Catholic. He tried to suggest a way to interpret Scripture so as to harmonize its teachings with the new science. By putting Galileo on trial, the Church cut itself off from one of the most crucial intellectual developments of the modern era. Hence, the following question can still be asked: Why did the Church put Galileo on trial? The primary and secondary sources for this unit will help you debate and answer this question.

Galileo Galilei

Image Sources: Jan Matejko, *Astronomer Copernicus, or Conversations with God*, 1873, Jagiellonian University
Justus Sustermans, *Portrait of Galileo Galilei*, c. 1640, courtesy of the National Maritime Museum.

History Group

GROUP MEMBERS:

Galileo's Crime

Your group's task is to explore history issues related to the trial of Galileo. A disciplinary compelling question is provided, and you will work from there to develop and answer supporting questions based on the sources. Follow the steps to complete the task.

Day One

1. Review the concept of compelling and supporting questions with your instructor. Briefly, compelling questions focus on meaningful and enduring problems. They ask us to deal with major issues and important ideas. Supporting questions are those that help us to answer a compelling question.
2. As a group, briefly discuss the following compelling question:

   > Why did the Church oppose Galileo's support for Copernicus's theory more than it had earlier opposed Copernicus himself?

3. Read and discuss Primary Sources 3.4, 3.5, and 3.7.
4. Read and discuss the following background information. Use the information to help complete the handout.

   > Nicolaus Copernicus's sun-centered model challenged the Church's belief that the Earth stood at the center of the universe. However, Copernicus may not have meant this literally. A Protestant theologian, Andreas Osiander, wrote a preface to Copernicus's book. In it, he said the Copernican system was not meant to be seen as physically true. It was only a simpler way to calculate and explain astronomical observations.
   >
   > Copernicus died just before his book was published, in 1543. It's not clear he actually agreed with Osiander. It is clear that Galileo did not agree. He boldly claimed that the Copernican system described reality itself. Copernicus was always respectful of Church authority. Galileo challenged it directly. His telescopic discoveries became famous. He also questioned the Church's literal way of interpreting scriptural passages. He had in mind passages that seemed to go against Copernican theory. In those cases, he said human reason and observation should be trusted more than the Bible itself. Many Church officials were angry at this challenge

to Church authority. Many other factors led Pope Urban VIII to oppose Galileo in the 1630s. Social, religious, and political tensions were high. The pope felt threatened by many things. As a result, the Church was far more anxious about Galileo than it had been about Copernicus.

5. Each group member should develop some supporting questions about the primary sources your group has been asked to discuss. Use the background information above to help you think about these questions. Develop supporting questions that will help answer your group's compelling question. As a group, choose one supporting question for each primary source and record those questions here.

Primary Source 3.4

Primary Source 3.5

Primary Source 3.7

Day Two

6. As a group, make a claim about your compelling question. The claim should be one you can back up with evidence from your assigned sources. This claim is your evidence-based answer to your group's own compelling question. Here is that question again:

> Why did the Church oppose Galileo's support for Copernicus's theory more than it had earlier opposed Copernicus himself?

State your group's claim here:

7. From the remaining seven sources for this lesson, choose one additional source that your group believes can help support or clarify its claim. The source may also be one that challenges this claim in a way that seems important. In the space below, list the source your group chose and briefly state why you chose it.

Source:

Reason for choosing this source:

8. Prepare a brief talk five- to ten-minute presentation. Summarize the sources you have used. Discuss the supporting questions you developed. Explain your answer to your group's discipline-based compelling question. Use the space below for notes or to create an outline of your group's presentation.

Civics Group

GROUP MEMBERS:

Galileo's Crime

Your group's task is to explore the civics issues related to the trial of Galileo. A compelling question is provided, and you will work from there to develop and answer supporting questions based on primary sources. Follow these steps to complete the task.

Day One

1. Review the concept of compelling and supporting questions with your instructor. Briefly, compelling questions focus on meaningful and enduring problems. They ask us to deal with major issues and important ideas. Supporting questions are those that help us to answer a compelling question.
2. As a group, briefly discuss the following compelling question:

   > Enlightenment philosopher Voltaire said the officials who tried Galileo would forever "suffer public hatred as the most unjust" of men. Is this a fair statement about the way Galileo was treated? Why or why not?

3. Read and discuss Primary Sources 3.5, 3.7, and 3.10.
4. Read and discuss the following background information. Use the information to help complete the handout.

   > The story of Galileo is often told in grand heroic terms. It is seen as one man of truth standing up to a united and ignorant Church. The reality is that the situation was much more complicated.
   >
   > The leading Church officials in Rome were not all united against Galileo. Some scholars of the powerful Jesuit order at the Roman College were skeptical about the Ptolemaic system. Some were at least partly open to Galileo's ideas. Many had been impressed with his telescopic discoveries. Cardinal Bellarmine, a member of the Inquisition, warned Galileo about his views. However, he did so in a way that left some room for Galileo to keep discussing them. Though Pope Urban VIII turned against Galileo in the end, he had long been friendly with him and had discussed Copernican ideas with him. He allowed him to write his book about those ideas—with some conditions that did not limit Galileo greatly.

At the same time, Galileo was often quite harsh to his critics. He may well have antagonized some whose help he could have used. In his ***Dialogue Concerning the Two Chief Systems of the World***, he had the simple-minded character Simplicio make the pope's favorite argument. Some thought he was only making fun of the pope. Did Galileo realize this would antagonize the pope? It is hard to tell.

5. Each group member should develop some supporting questions about the primary sources your group has been asked to discuss. Use the background information above to help you think about these questions. Develop supporting questions that will help answer your group's compelling question. As a group, choose one supporting question for each primary source and record those questions here.

Primary Source 3.5

Primary Source 3.7

Primary Source 3.10

Day Two

6. As a group, make a claim about your compelling question. The claim should be one you can back up with evidence from your assigned sources. This claim is your evidence-based answer to your group's own compelling question. Here is that question again:

Enlightenment philosopher Voltaire said the officials who tried Galileo would forever "suffer public hatred as the most unjust" of men. Is this a fair statement about the way Galileo was treated? Why or why not?

State your group's claim here:

7. From the remaining seven sources for this lesson, choose one additional source that your group believes can help support or clarify its claim. The source may also be one that challenges this claim in a way that seems important. In the space below, list the source your group chose and briefly state why you chose it.

Source:

Reason for choosing this source:

8. Prepare a brief five- to ten-minute presentation. Summarize the sources you have used. Discuss the supporting questions you developed. Explain your answer to your group's discipline-based compelling question. Use the space below for notes or to create an outline of your group's presentation.

Economics Group

GROUP MEMBERS:

Galileo's Crime

Your group's task is to explore the economics issues related to the trial of Galileo. A compelling question is provided, and you will work from there to develop and answer supporting questions based on the sources. Follow these steps to complete the task.

Day One

1. Review the concept of compelling and supporting questions with your instructor. Briefly, compelling questions focus on meaningful and enduring problems. They ask us to deal with major issues and important ideas. Supporting questions are those that help us to answer a compelling question.
2. As a group, briefly discuss the following compelling question:

   "The prosperity of Renaissance city-states such as Florence, in Tuscany, may have protected Galileo from the worst of what the Inquisition might have done to him." Explain this statement.

3. Read and discuss Primary Sources 3.4 and 3.10 and Secondary Source 3.9.
4. Read and discuss the following background information. Use the information to help complete the handout.

   Galileo's telescopic discoveries in 1610 made him famous. They led the grand duke of Tuscany, Cosimo II de' Medici of Florence, to appoint him his "Philosopher and Chief Mathematician." As a result, Galileo returned from Padua to his native Tuscany. There he would be a man honored and protected by his patron. The Medici family was one of the most powerful in Europe. They ruled Florence, one of Italy's wealthiest Renaissance cities. The wealth of the Medici family at first was based on the textile trade of their city. They became one of the most powerful banking families in Europe. They had great influence with the popes in Rome. In fact, the family itself supplied three popes.

   Galileo gained access to important Church officials in Rome in part because of the support of his powerful patron. The Church had to handle Galileo carefully. In 1632, Tuscany's ambassador in Rome pleaded Galileo's case before the pope. When Galileo arrived in Rome to be tried

in 1633, he was not put in prison. He was allowed to stay in the Tuscan ambassador's comfortable home. After the trial, he was sentenced to prison. Yet, he was allowed to live out his life in his own villa in Arcetri outside Florence. It is possible that without his protectors, Galileo's fate could have been even worse than it was.

5. Each group member should develop some supporting questions about the sources your group has been asked to discuss. Use the background information above to help you think about these questions. Develop supporting questions that will help answer your group's compelling question. As a group, choose one supporting question for each source and record those questions here.

Primary Source 3.4

Secondary Source 3.9

Primary Source 3.10

Day Two

6. As a group, make a claim about your compelling question. The claim should be one you can back up with evidence from your assigned sources. This claim is your evidence-based answer to your group's own compelling question. Here is that question again:

"The prosperity of Renaissance city-states such as Florence, in Tuscany, may have protected Galileo from the worst of what the Inquisition might have done to him." Explain this statement.

State your group's claim here:

7. From the remaining seven primary sources for this lesson, choose one additional source that your group believes can help support or clarify its claim. The source may also be one that challenges this claim in a way that seems important. In the space below, list the source your group chose and briefly state why you chose it.

Source:

Reason for choosing this source:

8. Prepare a brief five- to ten-minute presentation. Summarize the sources you have used. Discuss the supporting questions you developed. Explain your answer to your group's discipline-based compelling question. Use the space below for notes or to create an outline of your group's presentation.

Geography Group

GROUP MEMBERS:

Galileo's Crime

Your group's task is to explore geography issues related to the trial of Galileo. A compelling question is provided, and you will work from there to develop and answer supporting questions based on the sources. Follow these steps to complete the task.

Day One

1. Review the concept of compelling and supporting questions with your instructor. Briefly, compelling questions focus on meaningful and enduring problems. They ask us to deal with major issues and important ideas. Supporting questions are those that help us to answer a compelling question.
2. As a group, briefly discuss the following compelling question:

   > Explain why the location of the Papal States in the Europe of the 1630s might have added to the pope's decision to put Galileo on trial.

3. Read and discuss Primary Sources 3.6 and 3.10 and Secondary Source 3.9.
4. Read and discuss the following background information. Use the information to help complete the handout.

   > The pope was not merely the head of the Catholic Church. He was also the political leader of the Papal States. These small states in central Italy faced a real political challenge in the 1630s. At that time, Europe was engaged in the worst religious violence of the 16th and 17th centuries, the Thirty Years' War. This war mainly pitted Protestant states against Catholic states. However, Catholic France did ally with the Protestants against the Catholic Hapsburg Empire. The Hapsburg dynasty controlled Spain, much of central Europe, and what is now the Netherlands and Belgium. These are all north of the Papal States. The Hapsburgs also controlled the Kingdom of Naples to the south of the Papal States. Earlier popes had favored the Hapsburgs. Urban VIII, however, feared the Hapsburgs and was sympathetic to France.
   >
   > In 1630, the Protestant king of Sweden, Gustavus Adolphus, entered the conflict. By 1632, Protestant forces were pushing Catholic forces back in central Europe. In Rome, others in the Church were critical of the pope

for doing too little to support the Hapsburgs. Some even said he was too weak in his support for Catholicism itself. Could his turn against Galileo have been a way to reassure such critics? It is not easy to say, but it could have been a factor in his thinking.

5. Each group member should develop some supporting questions about the sources your group has been asked to discuss. Use the background information above to help you think about these questions. Develop supporting questions that will help answer your group's compelling question. As a group, choose one supporting question for each source and record those questions here.

Primary Source 3.6

Secondary Source 3.9

Primary Source 3.10

Day Two

6. As a group, make a claim about your compelling question. The claim should be one you can back up with evidence from your assigned sources. This claim is your evidence-based answer to your group's own compelling question. Here is that question again:

Explain why the location of the Papal States in the Europe of the 1630s might have added to the pope's decision to put Galileo on trial.

State your group's claim here:

7. From the remaining seven primary sources for this lesson, choose one additional source that your group believes can help support or clarify its claim. The source may also be one that challenges this claim in a way that seems important. In the space below, list the source your group chose and briefly state why you chose it.

Source:

Reason for choosing this source:

8. Prepare a brief five- to ten-minute presentation. Summarize the sources you have used. Discuss the supporting questions you developed. Explain your answer to your group's discipline-based compelling question. Use the space below for notes or to create an outline of your group's presentation.

How to Analyze a Primary Source

For this lesson, you will be studying several primary source documents. This handout offers suggestions for how best to read and analyze historical primary sources. Studying such sources is challenging. They were created in a different time and place. Their language and use of certain key terms often differ from ours. They assume things we might not accept. They arise out of historical circumstances and settings that differ greatly from our own times. To use such sources as evidence, you need to apply some special historical thinking skills and habits. Here are some guidelines to help you do this.

- ***Question the source.***

  No primary source was written with you and your interests in mind, so you need to be clear about what you are looking for when you examine a source. You need to stay in charge of the investigation. Act like a detective and ask questions. Above all, keep your own most important compelling questions in mind as you read and think about a source.

- ***Consider the source's origins.***

  This is often simply called "sourcing." It means asking who created the source, when and where the source was created, and why. If you know the source's purpose, you will be more likely to see how it is shaped by its creator's point of view. Among other things, sourcing can also help you decide how reliable or typical a source might be.

- ***Contextualize the source.***

  "Context" here means the broader historical setting for the source. Sources are always a part of a larger historical context. You need to consider how this context helps clarify the meaning of the source. You also need to decide which context is most important. Sources might be understood best in connection with a local context or a recent event. Alternatively, they might be understood better within a national or international context, or as part of a long-term trend in society at large. Your guiding questions should help you decide which context is most important.

- ***Corroborate the source.***

  This means you must think about your source in relation to other sources. Does the source agree with or support those other sources, or does it seem to be at odds with the other sources? Might there be additional sources, which have not been provided to you, that could support or conflict with your source?

- ***Above all, read the source carefully.***

  Look at language closely. Pay attention to images, emotional language, metaphors, and other literary devices. Think about what is implied, not merely what is stated or claimed in so many words. Think about what is left out as well as what is included. Make inferences based on your close reading. This will help you get more out of your source than even the source's creator might have seen in it.

PRIMARY SOURCE 3.1

Ptolemy's Universe

This is the scheme of the heavens described by Claudius Ptolemy in the 2nd century CE. It was this Earth-centered system the Catholic Church still backed in the 1600s. It fit in well with both Scripture and common sense. In it, the Earth is at the center of the universe. The heavenly spheres rotate around it as follows from the outside in toward Earth: The empyrean (fiery) heaven, dwelling of God and of all the saved; 10th heaven (Aristotle's first cause); 9th heaven, crystalline; 8th heaven, the stars in the firmament; 7th heaven, Saturn; 6th, Jupiter; 5th, Mars; 4th, Sun; 3rd, Venus; 2nd, Mercury; 1st, Moon.

Original Documents

This illustration reflects Aristotle's way of envisioning the universe.

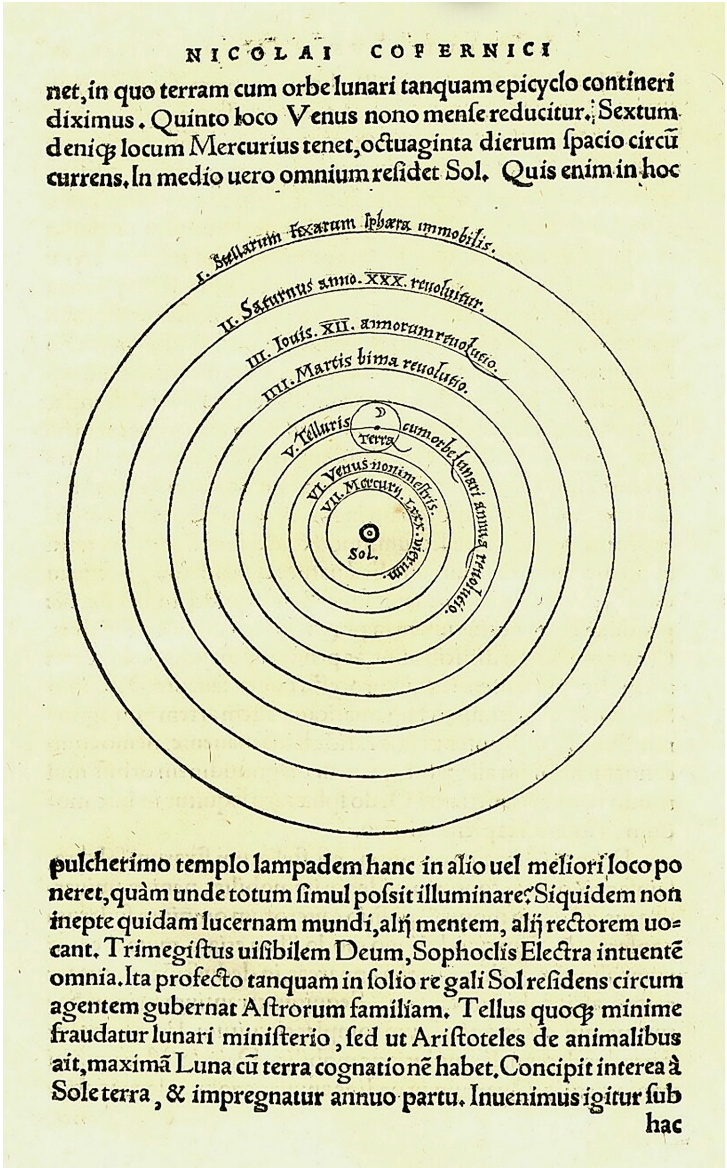
Imag Source: Peter Apian, illustration in *Cosmographia*, 1524.

PRIMARY SOURCE 3.2

The Copernican Revolution

This is an image of the heliocentric (sun-centered) model of the universe developed by Nicolaus Copernicus in his *De Revolutionibus Orbium Coelestium* (On the Revolutions of the Heavenly Spheres), published in 1543.

Original Document



NICOLAI COPERNICI

net, in quo terram cum orbe lunari tanquam epicyclo contineri diximus. Quinto loco Venus nono mense reducitur. Sextum denicꝫ locum Mercurius tenet, octuaginta dierum spacio circū currens. In medio uero omnium residet Sol. Quis enim in hoc

pulcherimo templo lampadem hanc in alio uel meliori loco ponеret, quàm unde totum simul possit illuminare? Siquidem non inepte quidam lucernam mundi, alij mentem, alij rectorem uocant. Trimegistus uisibilem Deum, Sophoclis Electra intuentē omnia. Ita profecto tanquam in solio regali Sol residens circum agentem gubernat Astrorum familiam. Tellus quoꝫ minime fraudatur lunari ministerio, sed ut Aristoteles de animalibus ait, maximā Luna cū terra cognationē habet. Concipit interea à Sole terra, & impregnatur annuo partu. Inuenimus igitur sub hac

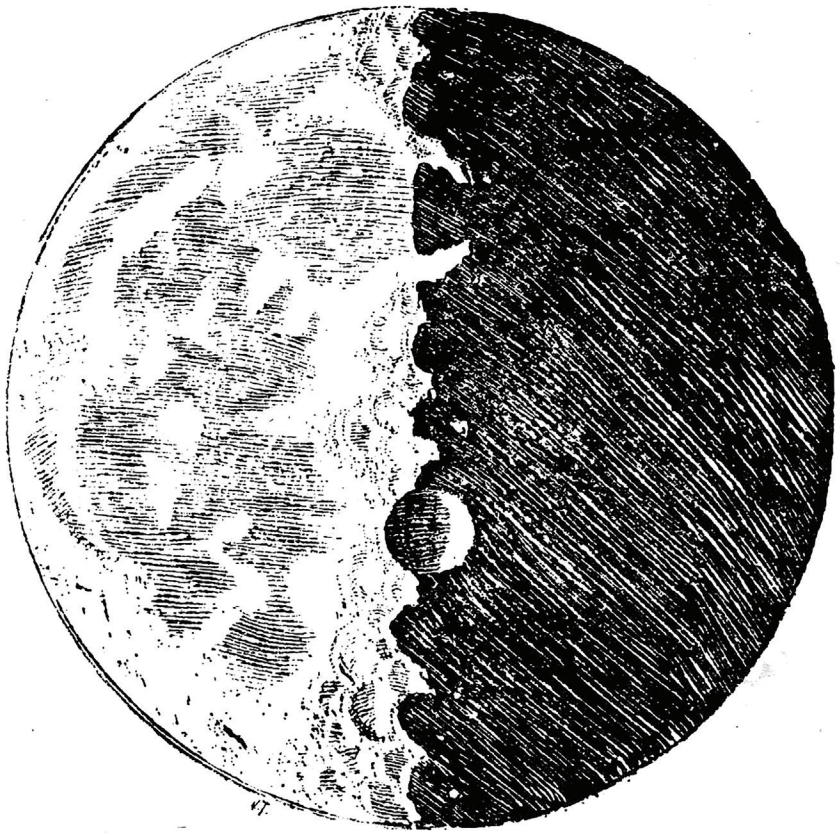
Image Source: Nicolaus Copernicus, illustration in *De Revolutionibus Orbium Coelestium*, 1543.

PRIMARY SOURCE 3·3

Galileo's Moon

This drawing shows the moon as a solid body with many irregular surface features. It is one of Galileo's drawings based on his observations using a telescope.

Original Document



Using a telescope, Galileo was able to see that the moon was not a perfect sphere.

Image Source: Galileo Galilei, drawing of the moon, courtesy of the Library of Congress, LC-USZ62-95171.

PRIMARY SOURCE 3·4

Galileo's Letter to Castelli

Benedetto Castelli was a monk, a mathematics teacher, and a friend of Galileo. In 1613, he wrote to Galileo about concerns that the grand duchess of Tuscany, Christina, had about Galileo's ideas. (The grand duchess was the mother of Galileo's patron, Cosimo II de' Medici.) The grand duchess was upset because Galileo's sun-centered theory seemed to contradict certain biblical passages. For example, there is a biblical passage in which Joshua orders the sun to stand still. Galileo wrote a long response. His letter to Castelli was circulated widely, and it helped lead to Galileo's first confrontation with the Inquisition in 1616.

Original Document

In regard to the first general point of the Most Serene Ladyship, it seems to me very prudent of her to propose and of you to concede and to agree that the Holy Scripture can never lie or err, and that its declarations are absolutely and inviolably true. I should have added only that, though the Scripture cannot err, nevertheless some of its interpreters and expositors can sometimes err in various ways. One of these would be very serious and very frequent, namely to want to limit oneself always to the literal meaning of the words; for there would thus emerge not only various contradictions but also serious heresies and blasphemies, and it would be necessary to attribute to God feet, hands and eyes, as well as bodily and human feelings like anger, regret, hate and sometimes even forgetfulness of things past and ignorance of future ones. Thus in the Scripture one finds many propositions which look different from the truth if one goes by the literal meaning of the words, but which are expressed in this manner to accommodate the incapacity of common people. . . .

[O]n the other hand, nature is inexorable and immutable, and she does not care at all whether or not her recondite reasons and modes of operations are revealed to human understanding, and so she never transgresses the terms of the laws imposed on her; therefore, whatever sensory experience places before our eyes or necessary demonstrations prove to us concerning natural effects should not in any way be called into question on account of scriptural passages whose words appear to have a different meaning, since not every statement of the Scripture is bound to obligations as severely as each effect of nature.

CONTINUED

Adapted Version

In regard to the first point she made, I believe it is wise for her to say that the Holy Scripture can never lie or err. It was also wise for you to agree to that. The Holy Scripture's declarations are absolutely and always true. I would, however, add this. Although the Scripture cannot err, some of those who interpret it can err in various ways. One of the most common errors is to limit oneself always to the literal meaning of the words. This error results in various contradictions and also serious heresies and blasphemies as well. For example, a literal interpretation would force one to say that God has feet, hands, and eyes, as well as bodily and human feelings like anger, regret, hate, and sometimes even forgetfulness of things past and ignorance of future ones. Many statements in the Scripture would appear false if one only goes by the literal meaning of the words. Often things are expressed in this manner in order to make it easy for common people to grasp.

On the other hand, nature is what she is. She cannot be changed. She does not care at all whether or not humans can understand her reasons and ways of behaving. She never alters the laws imposed on her. Therefore, whatever we observe with our senses or can prove concerning natural effects should not be called into question simply because of scriptural passages whose words appear to have a different meaning. Not every statement of the Scripture is bound to be taken literally and strictly as each effect of nature.

Original Document Source: Galileo to Benedetto Castelli, in *The Galileo Affair: A Documentary History*, ed. Maurice A. Finocchiaro (Berkeley: University of California Press, 1989).

PRIMARY SOURCE 3·5

Bellarmine's Reply to Foscarini—and Galileo

In 1615, a friar named Paolo Antonio Foscarini published his own defense of Copernicus. Like Galileo, he also argued that Copernicus did not contradict Scripture. Cardinal Roberto Bellarmine wrote Foscarini, with Galileo in mind as well. Bellarmine was a member of the Roman Inquisition and the Index of Prohibited Books. However, he was not opposed to any discussion at all of Copernicus's ideas. He agreed that Copernicus did explain astronomical observations well. But he did not think Copernican theory actually described reality itself. This passage is part of his reply to Foscarini. He also directed it at Galileo. In it, he explains what it would take to convince theologians to change their views about the relevant Bible passages regarding Earth's place in the universe.

Original Document

First. I say that it seems to me that Your Reverence and Galileo did prudently to content yourself with speaking hypothetically, and not absolutely, as I have always believed that Copernicus spoke. For to say that, assuming the earth moves and the sun stands still, all the appearances are saved better than with eccentrics and epicycles, is to speak well; there is no danger in this, and it is sufficient for mathematicians. But to want to affirm that the sun really is fixed in the center of the heavens and only revolves around itself without traveling from east to west, and that the earth is situated in the third sphere and revolves with great speed around the sun, is a very dangerous thing, not only by irritating all the philosophers and scholastic theologians, but also by injuring our holy faith and rendering the Holy Scriptures false. . . . I say that if there were a true demonstration [of these things] . . . then it would be necessary to proceed with great caution in explaining the passages of Scripture which seemed contrary, and we would rather have to say that we did not understand them than to say that something was false which has been demonstrated. But I do not believe that there is any such demonstration; none has been shown to me.

CONTINUED

Adapted Version

First, I say it was prudent of you and Galileo to speak hypothetically, and not absolutely. I have always believed that Copernicus spoke hypothetically. It is acceptable to say that you can account better for all heavenly observations by assuming the earth moves and the sun stands still. That is, all observed movements of the heavens are explained this way better than with eccentrics and epicycles. There is no danger in claiming this. It is helpful to mathematicians. But it is very different to affirm that the sun really is fixed in the center of the heavens and only revolves around itself without traveling from east to west. Or to claim that the earth is in the third sphere and revolves with great speed around the sun. Saying these things are really so is a very dangerous thing. For one thing, it irritates all the philosophers and scholastic theologians. But it also injures our holy faith. It renders the Holy Scriptures false. I say that if there were a true and proven demonstration of these things, then it would be necessary to proceed with great caution in explaining the passages of Scripture that seem to go against it. And we would rather have to say that we did not understand these passages than to say that something was false that has been proven true. But I do not believe that there is any such demonstration or absolute proof. None has been shown to me.

Original Document Source: Bellarmine to Paolo Foscarini, in *Internet History Sourcebooks*, Fordham University.

PRIMARY SOURCE 3.6

The Council of Trent on Interpreting Scripture

From 1545 to1563, Catholic leaders met three times in the northern Italian city of Trent to decide how best to meet the challenge posed by the Protestant Reformation. Known as the Council of Trent, these meetings reasserted the truth of Catholic doctrine, reformed religious orders, and set higher standards for monks, priests, and the entire Church hierarchy. It took a strict line in insisting on tighter Church control over any and all interpretations of Scripture.

Original Document

Furthermore, in order to restrain petulant spirits, It decrees, that no one, relying on his own skill, shall,—in matters of faith, and of morals pertaining to the edification of Christian doctrine,—wresting the sacred Scripture to his own senses, presume to interpret the said sacred Scripture contrary to that sense which holy mother Church,--whose it is to judge of the true sense and interpretation of the holy Scriptures,--hath held and doth hold; or even contrary to the unanimous consent of the Fathers; even though such interpretations were never (intended) to be at any time published. Contraveners shall be made known by their Ordinaries, and be punished with the penalties by law established.

Adapted Version

The Council decrees that no person of petulant spirit can rely on his own skill to interpret sacred Scripture in matters of faith and morals. No one can make Scripture fit with his own sense when it goes against the sense held by the holy mother Church. It is for the Church to judge the true meaning of the holy Scriptures. Nor can anyone interpret Scripture contrary to the unanimous consent of the Fathers. He cannot do this even if he never planned to publish his views. Higher Church authorities should identify those who disobey this decree so they can be punished with the penalties established by law.

Original Document Source: "Decree Concerning the Edition, and the Use, of the Sacred Books," in *The Council of Trent, Fourth Session: The Canons and Decrees of the Sacred and Oecumenical Council of Trent, 1546*, trans. J. Waterworth (London: Dolman, 1848).

PRIMARY SOURCE 3·7

Simplicio States the Pope's View

Pope Urban VIII did give Galileo permission to write his *Dialogue Concerning the Two Chief Systems of the World*. He demanded only two things. First, Galileo had to treat Copernicus's ideas only as a hypothesis. By this, the pope merely meant the Copernican system was an easier way of calculating astronomical movements, not an actual description of reality. Secondly, he asked Galileo to stress God's all-powerful nature—that is, the idea that God could make the world in any manner he wanted, no matter what any scientifically understood natural law seemed to require. In this excerpt, the character Simplicio states the pope's second concern, the one about God's omnipotence. To say the least, the pope was not happy about the way Galileo presented this idea.

Original Document

Simplicio: As for the past discourses, and particularly this last, of the reason of the ebbing and flowing of the sea, I do not, to speak the truth, very well comprehend it. But by that slight idea, whatever it be . . . I confess that your hypothesis seems to me far more ingenious than any of all those that I ever heard besides; still, I esteem it neither true nor conclusive, but, keeping always before the eyes of my mind a solid doctrine that I once received from a most learned and eminent person, and to which there can be no answer, I know that both of you, being asked whether God, by his infinite power and wisdom, might confer upon the element of water the reciprocal motion in any other way than by making the containing vessel to move, I know, I say, that you will answer that he could, and also know how to bring it about in many ways, and some of them above the reach of our intellect.

Adapted Version

Simplicio: I cannot say I fully understand many of our past discussions, particularly this last on the ebbing and flowing of the tides. But with the little I do understand, your hypothesis about it does seem better than others I have heard. Yet I don't accept it as either true or conclusive. Instead, I keep reminding myself of a solid idea I once got from a very learned and distinguished person. I believe there can be no objection to this idea. I am sure both of you would agree with it. That is, I am sure you would agree if asked whether God, by his infinite power and wisdom, could make the tides move in and out in some other way than by making the containing vessel (the earth) move. I know you will answer that he could. And you will also say that he would know how to bring it about in many ways, some of which are beyond our intellect's ability to understand.

Original Document Source: Galileo Galilei, *Dialogue Concerning the Two Chief World Systems*, trans. Stillman Drake (Berkeley: University of California Press, 1953).

PRIMARY SOURCE 3.8

What the Pope Feared

At one point in 1632, Pope Urban VIII said Galileo was "dealing with the most perverse subject one could ever come across." No one knows for sure what the pope meant. Perhaps he saw Galileo's "scientific" way of thinking as itself a dangerous form of pride and arrogance? In the 1600s, scientists, astrologers, and magicians were not thought of as clearly separate types. They all searched for ways to control nature. Many in the Church saw them trying to go beyond limits God had set on human will and understanding. The pope expressed these fears in a papal bull, or decree, in 1631. It was directed mainly against the use of astrology to predict what would happen to princes, popes, and other leaders. This decree was issued just one year before Galileo's *Dialogue Concerning the Two Chief World Systems* aroused the pope's anger.

Original Document

> The inscrutable profundity of the judgement of God does not allow the human intellect, confined to the dark prison of the body, to rise beyond the stars. Yet not only does it dare explore with impious curiosity the mysteries buried in the depth of the divine and unknown even to the saints, it also presumes, with arrogant and dangerous example, to circulate these mysteries as certainties, with contempt for God, disturbance of the state, and danger to princes.

Adapted Version

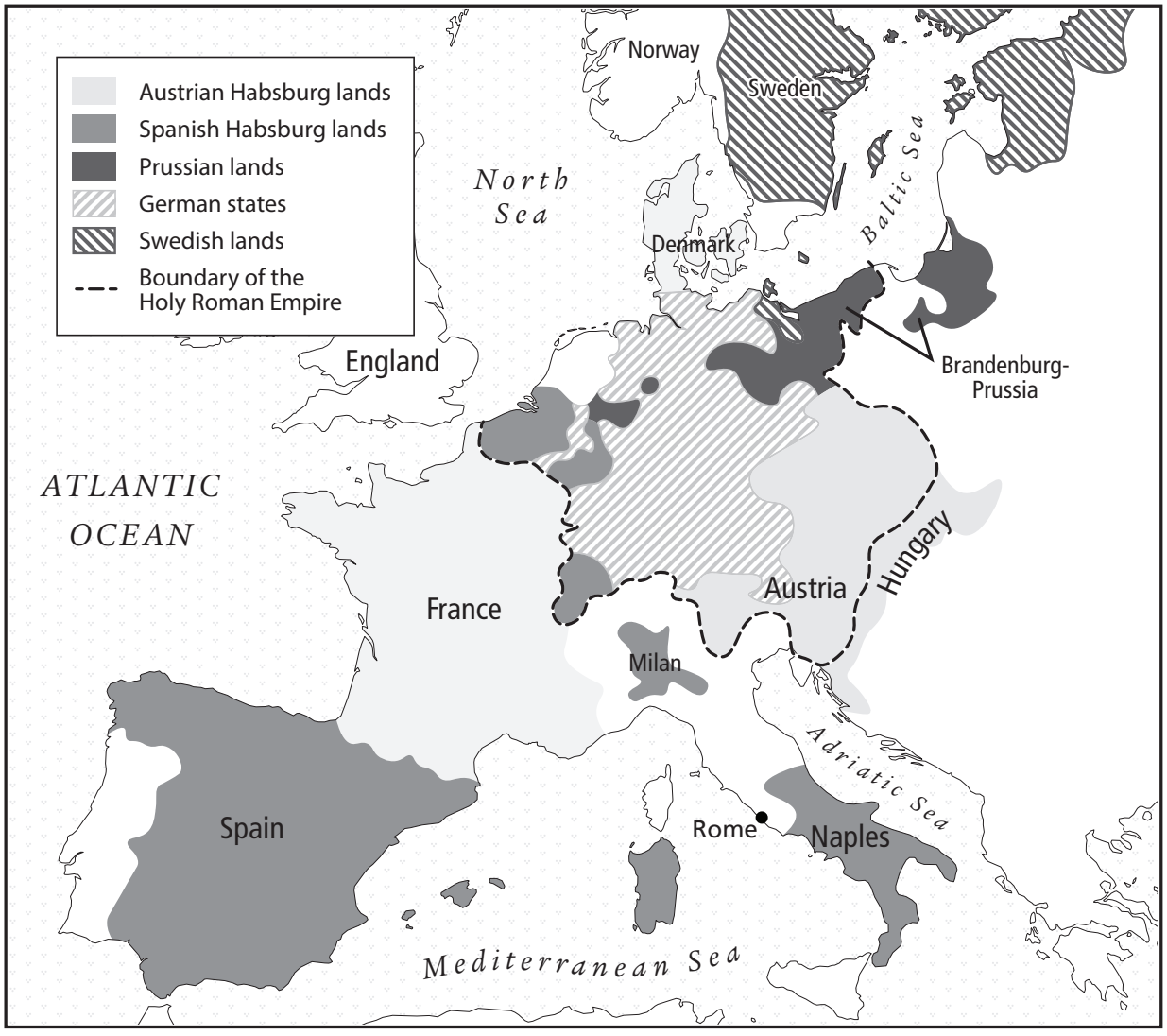
> God's inscrutable and profound judgment confines human intellect to the dark prison of the body. He does not allow it to rise beyond the stars. Yet with impious curiosity, humans dare to explore deep and buried divine mysteries—mysteries unknown even to the saints. Human intellect also arrogantly publicizes these mysteries as certainties. This is done with contempt for God, disturbance to the state, and danger to princes.

Original Document Source: Pope Urban VIII, Papal Bull, *Contra Astrologos Iudiciarios*, in J. L. Heilbron, *Galileo* (New York: Oxford University Press, 2010).

SECONDARY SOURCE 3·9

Europe during the Thirty Years' War

This map shows the basic political boundaries of Europe during the Thirty Years' War, 1618–1648. The war mainly pitted Catholics against Protestants. However, Catholic France often allied with the Protestant states against the vast Catholic Hapsburg realms. The Hapsburgs controlled Spain, Southern Italy, German and Austrian lands, Belgium, and the Netherlands. The Papal States and Rome were caught between these two Catholic superpowers, France and the Hapsburgs. Pope Urban VIII favored France, but many Church officials in Rome favored the Hapsburgs. Some of those officials thought the pope was not defending the Catholic Hapsburgs forcefully enough against France and its Protestant allies.



PRIMARY SOURCE 3.10

Galileo's Exile and Galileo's World

Galileo was convicted on June 22, 1633, and was sentenced to life in prison. However, this was changed to house arrest. In December 1633, he returned to his own villa in Arcetri in Tuscany. On March 7, 1634, he wrote to his friend Elia Diodati, a Protestant lawyer living in Paris. Diodati was a strong supporter of Galileo's ideas. The letter shows that Galileo was not completely cut off from the world. It also suggests how hard it would be for the Church to isolate him or keep his ideas from finding support both in Italy and elsewhere in Europe.

Original Document

From Siena, I was allowed to return to my villa, where I still am, being forbidden to go into the city; this prohibition is made in order to keep me away from the court and princes. However, since I returned to the villa . . . two days after the grand duke [Ferdinando II de' Medici] returned to Florence, he sent me a member of his staff to notify me that he was on his way to visit me; half an hour later he arrived in a very small carriage accompanied by a single gentleman, and he came into my house and stayed almost two hours talking to me with extreme kindness. Thus, I have not suffered at all in the two things that should be esteemed above all others, that is health and reputation. . . . The wrongs and injustices which envy and ill will have perpetrated against me have not bothered and do not bother me. Instead, given that my health and honor remain unharmed, the greatness of the abuse is rather comforting to me and represents a kind of revenge; the infamy reverts back to the traitors and those who are in the highest state of ignorance, which is the mother of all ill will, envy, anger and all other wicked and ugly vices and sins.

Adapted Version

From Siena, I was allowed to return to my villa where I still am. I am forbidden to go into the city. This prohibition is made in order to keep me away from the court and princes. However, I returned to the villa two days after the grand duke [Ferdinando II de' Medici] returned to Florence, and a member of his staff came to tell me that he was on his way to visit me. Half an hour later he arrived in a very small carriage along with a single gentleman. He came into my house and stayed almost two hours talking to me with extreme kindness. Thus, I have not suffered at all in the two things that matter most, health and reputation. I am not bothered by the wrongs and injustices which envy and ill will have done to me. Instead, given that my health and honor remain unharmed, the abuse is rather comforting to me. It represents a kind of revenge since it only reflect back badly on the traitors and those who are in the highest state of ignorance. That ignorance is the mother of all ill will, envy, anger and all other wicked and ugly vices and sins.

Original Document Source: Galileo to Elia Diodati, in Maurice A. Finocchiaro, *Retrying Galileo, 1633–1992* (Berkeley: University of California Press, 2005).

Communicating Results and Taking Action

Communicating Results

- Reread Primary Source 3.7. This is the passage in Galileo's *Dialogue* in which Simplicio states Pope Urban VIII's views about God's ability to shape the universe as he wished. This passage angered the pope. Rewrite the passage in a way that you think Pope Urban VIII would approve. Along with your rewrite of the passage, write a brief one- or two-page essay explaining why you believe your passage would have satisfied the pope and why Galileo could have accepted it as well.
- Pretend to be a friend of Galileo. You have been given a copy of Galileo's sketch of the moon (Primary Source 3.3). Read Bellarmine's remarks in Primary Source 3.5. Your task is to send the sketch to Bellarmine and use it and your general knowledge of Galileo's case to write a long letter defending him and explaining why Bellarmine should allow him to continue to defend his views.
- Your teacher will separate the class into small groups. Each group's task is to discuss Galileo's complete letter to Benedetto Castelli in 1613 (see Primary Source 3.4). The complete letter can be accessed online at http://inters.org/Galilei-Benedetto-Castelli. Each group will prepare a brief talk on the letter in which they share one passage they think adds important points other than the one expressed in Primary Source 3.4. Each group should be prepared to share its list of additional points in a brief discussion with the class.

Taking Action

- In our age, a trial like the one Galileo endured is unlikely to occur. However, many scientific controversies often involve scientists in political conflict. The teacher will separate students into four small groups and ask each group to research controversies over one of the following issues: vaccinations, nuclear power, genetically modified organisms (GMOs), and climate change. Each group should prepare a brief presentation that defines the nature of the controversy, explains what the differing views among the scientists are, and summarizes the views of politicians and the public. The groups will present their findings to the class and state their own views as to how the controversies they have identified might be resolved. The teacher may invite other students, parents, and community members to the presentations.
- Based on the work in the previous assignment, use PowerPoint or some other presentation software to create a summary report on the findings of the four groups. Use social media (Twitter, Facebook, etc.) to share this report with others. Invite people contacted in this way to comment and offer their own thoughts about one or more of the controversies discussed.

Galileo's Crime Rubric

Criteria	Unacceptable	Developing	Proficient	Excellent
Focus	Tries to respond to task instructions but lacks clear focus on a central idea or thesis	Addresses the task instructions adequately but focus on a central idea or thesis is uneven	Responds to the task instructions appropriately and convincingly; has a consistent focus on a central idea or thesis	Responds to all task instructions convincingly; has a clear and strong focus on a well-developed central idea or thesis
Research	Refers to some sources but fails to connect these in a relevant way to the task instructions	Refers to relevant sources well but does not always connect these clearly to the task instructions	Refers to relevant sources accurately and usually connects these to the task instructions and a central idea	Refers to relevant sources accurately and in great detail and connects these clearly to the task instructions and a central idea
Development and Use of Evidence	Uses some details and evidence from sources but does not make clear the relevance to the task purpose or instructions	Uses details and evidence from sources generally but not always in support of a clear focus relevant to the task purpose or instructions	Uses details and evidence from sources in a way that effectively supports a focus relevant to the task purpose or instructions	Uses details and evidence from sources along with clear explanations demonstrating deep understanding of the task purpose or instructions
Content	Refers to disciplinary content without clearly understanding it or while using it in an irrelevant or inaccurate manner	Refers to disciplinary content with some understanding but not always with a clear idea of its relation to the overall task	Accurately uses disciplinary content and demonstrates a clear idea of its relation to the overall task	Uses disciplinary content effectively and explains thoroughly and in-depth its relation to the overall task
Conventions	Demonstrates only limited control of standard English conventions, with many errors in spelling, punctuation, grammar, and other conventions	Demonstrates some command of standard English conventions with limited errors in spelling, punctuation, grammar, and other conventions	Demonstrates adequate command of standard English conventions with few errors in spelling, punctuation, grammar, and other conventions	Demonstrates a well-developed command of standard English conventions with few errors and a use of language appropriate to the audience and the purpose of the task

Primary and Secondary Source Bibliography

3.1: Apian, Peter. *Cosmographia*. 1524.

3.2: Copernicus, Nicolaus. *De Revolutionibus Orbium Coelestium*. 1543.

3.3: Galilei, Galileo. Drawing of the moon. Courtesy of the Library of Congress, LC-USZ62-95171.

3.4: Galilei, Galileo. Galileo to Benedetto Castelli. In *The Galileo Affair: A Documentary History*. Edited by Maurice A. Finocchiaro. Berkeley: University of California Press, 1989.

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3.7: Galilei, Galileo. *Dialogue Concerning the Two Chief World Systems*. Translated by Stillman Drake. Berkeley: University of California Press, 1953.

3.8: Pope Urban VIII. *Contra Astrologos Iudiciarios. In Galileo*, by J. L. Heilbron. New York: Oxford University Press, 2010.

3.9: © Nystrom Education.

3.10: Galilei, Galileo. Galileo to Elia Diodati. In *Retrying Galileo, 1633–1992*, by Maurice A. Finocchiaro. Berkeley: University of California Press, 2005.

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