

Galileo Lesson

Central Historical Question: Was Galileo really a heretic?

Instructions:

1. Review the notes and timeline below.
2. Read and mark the documents.
3. Answer the questions for each of the documents (found below).
4. Answer the central historical question using evidence from the documents and your knowledge of world history.

Notes:

- Many people in early modern Christian Europe believed that the earth was the center of the universe and the sun moved around the earth.
- During the Scientific Revolution, some people, notably Copernicus, began to challenge this belief.
 - Galileo became very famous for this belief because it got him in trouble with the Catholic Church.
- During the 17th century, European scholars increasingly tried to understand the natural world through science.
 - Galileo Galilei was one of those scientists, and he is sometimes called the Father of Scientific Reason
- There are two models of the solar system:
 - Geocentrism is a model that places the earth at the center of the astronomical system. In this model, other bodies in space orbit around the earth.
 - Heliocentrism is a model that places the sun at the center of the astronomical system. In this model, other bodies in space orbit around the sun.
 - Heliocentric model contradicts the Bible
 - Copernicus was the first scientist to challenge the idea of geocentrism. He knew how radical his theory was so he published his work right before his death
- Catholic Church convened the council of Trent in 1545 to stop the spread of Protestantism and to revive the Catholic Church.
 - Council decreed that only the Catholic Church could interpret the Bible and established the Holy Office of the Roman Inquisition to persecute heretics
- Galileo was born in Pisa, Italy in 1564.
 - He was very religious and even wanted to be a monk at one point.
 - He instead studied motion and physics at University of Pisa.
 - Convinced of the heliocentric model, he began to teach this to his students.
 - The Catholic Church warned him to stop in 1615.
 - In 1616, the Church banned all works that supported heliocentrism, but Galileo continued to write and publish ideas about his theory.

- In 1632, his book, *Dialogue Concerning the Two Chief World Systems*, came too close to arguing the theory was true, and he was then brought before Inquisition as a heretic the following year.

Timeline:

Heliocentrism and the Catholic Church Timeline

1543: Nicolas Copernicus published a book supporting the heliocentric theory.

1545: Pope Paul III called the Council of Trent to stop the spread of Protestantism and to revive the Catholic Church. It said only the Church could interpret the Bible, and it set up the Inquisition to combat heresy.

1564: Galileo Galilei was born.

1600: The Inquisition tried Giordano Bruno and burned him at the stake for heresy. He supported the heliocentric theory.

1609: Galileo invented a telescope that convinced him of the heliocentric model.

1615: The Catholic Church told Galileo to stop sharing his theory in public.

1615: Paolo Antonio Foscarini published a book defending Copernicus and arguing the heliocentric model did not go against the Bible.

1616: The Catholic Church added Copernicus's work (and others supporting the heliocentric model) to its list of banned books.

1632: Galileo published *Dialogue Concerning the Two Chief World Systems*.

1633: The Inquisition charged Galileo with heresy and tried him in Rome.

1642: Galileo died.

1661: Isaac Newton began teaching Galileo and Copernicus's ideas in England.

1758: The Catholic Church ended the ban on books teaching the heliocentric model.

1939: Pope Pius XII called Galileo a hero of research.

1979: Pope John Paul II ordered an investigation into the Church's treatment of Galileo.

Using these facts, the timeline and the documents that follow, decide whether Galileo was really heretic.

Document A: Galileo's Letter (Excerpted from Original)

To the Most Serene Grand Duchess Mother:

Some years ago, as Your Serene Highness well knows, I discovered in the heavens many things that had not been seen before our own age. The novelty of these things, as well as some consequences which followed from them in contradiction to the physical notions commonly held among academic philosophers, stirred up against me no small number of professors-as if I had placed these things in the sky with my own hands in order to upset nature and overturn the sciences. They seemed to forget that the increase of known truths stimulates the investigation, establishment, and growth of the arts; not their diminution or destruction.

Showing a greater fondness for their own opinions than for truth, they sought to deny and disprove the new things which, if they had cared to look for themselves, their own senses would have demonstrated to them. To this end they hurled various charges and published numerous writings filled with vain arguments, and they made the grave mistake of sprinkling these with passages taken from places in the Bible which they had failed to understand properly, and which were ill-suited to their purposes. . . .

The reason produced for condemning the opinion that the earth moves and the sun stands still in many places in the Bible one may read that the sun moves and the earth stands still. Since the Bible cannot err; it follows as a necessary consequence that anyone takes a erroneous and heretical position who maintains that the sun is inherently motionless and the earth movable.

With regard to this argument, I think in the first place that it is very pious to say and prudent to affirm that the holy Bible can never speak untruth-whenver its true meaning is understood. But I believe nobody will deny that it is often very abstruse, and may say things which are quite different from what its bare words signify. Hence in expounding the Bible if one were always to confine oneself to the unadorned grammatical meaning, one might fall into error. Not only contradictions and propositions far from true might thus be made to appear in the Bible, but even grave heresies and follies. Thus it would be necessary to assign to God feet, hands and eyes, as well as corporeal and human affections, such as anger, repentance, hatred, and sometimes even the forgetting of things past and ignorance of those to come. These propositions uttered by the Holy Ghost were set down in that manner by the sacred scribes in order to accommodate them to the capacities of the common people, who are rude and unlearned. For the sake of those who deserve to be separated from the herd, it is necessary that wise expositors should produce the true senses of such passages, together with the special reasons for which they were set down in these words. This doctrine is so widespread and so definite with all theologians that it would be superfluous to adduce evidence for it. . . .

But I do not feel obliged to believe that the same God who has endowed us with senses, reason and intellect has intended us to forego their use and by some other means to give us knowledge which we can attain by them. He would not require us to deny sense and reason in physical matters which are set before our eyes and minds by direct experience or necessary demonstrations. This must be especially true in those sciences of which but the faintest trace (and that consisting of conclusions) is to be found in the Bible. Of astronomy; for instance, so little is found that none of the planets except Venus are so much as mentioned, and this only once or twice under the name of "Lucifer." If the sacred scribes had had any intention of teaching people certain arrangements and motions of the heavenly bodies, or had they wished

us to derive such knowledge from the Bible, then in my opinion they would not have spoken of these matters so sparingly in comparison with the infinite number of admirable conclusions which are demonstrated in that science. Far from pretending to teach us the constitution and motions of the heavens and other stars, with their shapes, magnitudes, and distances, the authors of the Bible intentionally forbore to speak of these things, though all were quite well known to them. . . .

From these things it follows as a necessary consequence that, since the Holy Ghost did not intend to teach us whether heaven moves or stands still, whether its shape is spherical or like a discus or extended in a plane, nor whether the earth is located at its center or off to one side, then so much the less was it intended to settle for us any other conclusion of the same kind. And the motion or rest of the earth and the sun is so closely linked with the things just named, that without a determination of the one, neither side can be taken in the other matters. Now if the Holy Spirit has purposely neglected to teach us propositions of this sort as irrelevant to the highest goal (that is, to our salvation), how can anyone affirm that it is obligatory to take sides on them, that one belief is required by faith, while the other side is erroneous? Can an opinion be heretical and yet have no concern with the salvation of souls? Can the Holy Ghost be asserted not to have intended teaching us something that does concern our salvation? I would say here something that was heard from an ecclesiastic of the most eminent degree: "That the intention of the Holy Ghost is to teach us how one goes to heaven. not how heaven goes."

Source: Galileo Galilei, "Letter to the Grand Duchess Christina of Tuscany," 1615.

1. (Sourcing) When was this document written?
2. (Contextualization) Look at the timeline. Why might Galileo write a letter defending himself at this time?
3. (Close Reading) According to Galileo, why do some people think his teachings are heretical?
4. (Close Reading) How does Galileo defend himself against these charges?
5. (Context) Using the information on your timeline, do you think the Catholic Church would accept Galileo's defense? Why or why not?

Document B: Cardinal Bellarmine (Excerpted from Original)

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 (i.e., turns upon its axis) 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. For Your Reverence has demonstrated many ways of explaining Holy Scripture, but you have not applied them in particular, and without a doubt you would have found it most difficult if you had attempted to explain all the passages which you yourself have cited.

Second. I say that, as you know, the Council [of Trent] prohibits expounding the Scriptures contrary to the common agreement of the holy Fathers. And if Your Reverence would read not only the Fathers but also the commentaries of modern writers on Genesis, Psalms, Ecclesiastes and Josue, you would find that all agree in explaining literally (*ad litteram*) that the sun is in the heavens and moves swiftly around the earth, and that the earth is far from the heavens and stands immobile in the center of the universe. Now consider whether in all prudence the Church could encourage giving to Scripture a sense contrary to the holy Fathers and all the Latin and Greek commentators. Nor may it be answered that this is not a matter of faith, for if it is not a matter of faith from the point of view of the subject matter, it is on the part of the ones who have spoken. It would be just as heretical to deny that Abraham had two sons and Jacob twelve, as it would be to deny the virgin birth of Christ, for both are declared by the Holy Ghost through the mouths of the prophets and apostles.

Third. I say that if there were a true demonstration that the sun was in the center of the universe and the earth in the third sphere, and that the sun did not travel around the earth but the earth circled the sun, 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. It is not the same thing to show that the appearances are saved by assuming that the sun really is in the center and the earth in the heavens. I believe that the first demonstration might exist, but I have grave doubts about the second, and in a case of doubt, one may not depart from the Scriptures as explained by the holy Fathers. I add that the words 'the sun also riseth and the sun goeth down, and hasteneth to the place where he ariseth, etc.' were those of Solomon, who not only spoke by divine inspiration but was a man wise above all others and most learned in human sciences and in the knowledge of all created things, and his wisdom was from God. Thus it is not too likely that he would affirm something which was contrary to a truth either already demonstrated, or likely to be demonstrated. And if you tell me that Solomon spoke only according to the appearances, and that it seems to us that the sun goes around when actually it is the earth which moves, as it seems to one on a ship that the beach moves away from the ship, I shall answer that one who departs from the beach, though it looks to him as though the beach moves away, he knows that he is in error and corrects it, seeing clearly that the ship moves and not the beach. But with regard to the sun and the earth, no wise man is needed to correct the error, since he clearly experiences that the earth stands still and that his eye is not deceived when it

judges that the moon and stars move. And that is enough for the present. I salute Your Reverence and ask God to grant you every happiness.

Source: Cardinal Robert Bellarmine, *“Letter on Galileo’s Theories,”* 1615

1. (Close Reading) Explain two reasons Cardinal Bellarmine gave for believing the geocentric theory.

2. (Close Reading) How did Cardinal Bellarmine respond to the following arguments from Galileo?

a. The Bible passages about the sun standing still should not have been interpreted literally.

b. The model of the universe (heliocentric or geocentric) is not a matter of salvation.

3. (Context) Why do you think the Catholic Church was so committed to defending the literal meaning of the Bible passages?

Document C: Condemnation of Galileo (Excerpted from Original)

Whereas you, Galileo, son of the late Vincenzio Galilei, of Florence, aged seventy years, were denounced in 1615, to this Holy Office, for holding as true a false doctrine taught by many, namely, that the sun is immovable in the center of the world, and that the earth moves, and also with a diurnal motion; also, for having pupils whom you instructed in the same opinions; also, for maintaining a correspondence on the same with some German mathematicians; also for publishing certain letters on the sun-spots, in which you developed the same doctrine as true; also, for answering the objections which were continually produced from the Holy Scriptures, by glozing the said Scriptures according to your own meaning; and whereas thereupon was produced the copy of a writing, in form of a letter professedly written by you to a person formerly your pupil, in which, following the hypothesis of Copernicus, you include several propositions contrary to the true sense and authority of the Holy Scriptures; therefore (this Holy Tribunal being desirous of providing against the disorder and mischief which were thence proceeding and increasing to the detriment of the Holy Faith) by the desire of his Holiness and the Most Eminent Lords, Cardinals of this supreme and universal Inquisition, the two propositions of the stability of the sun, and the motion of the earth, were qualified by the Theological Qualifiers as follows:

1. The proposition that the sun is in the center of the world and immovable from its place is absurd, philosophically false, and formally heretical; because it is expressly contrary to Holy Scriptures.
2. The proposition that the earth is not the center of the world, nor immovable, but that it moves, and also with a diurnal action, is also absurd, philosophically false, and, theologically considered, at least erroneous in faith.

Therefore . . . , invoking the most holy name of our Lord Jesus Christ and of His Most Glorious Mother Mary, We pronounce this Our final sentence: We pronounce, judge, and declare, that you, the said Galileo . . . have rendered yourself vehemently suspected by this Holy Office of heresy, that is, of having believed and held the doctrine (which is false and contrary to the Holy and Divine Scriptures) that the sun is the center of the world, and that it does not move from east to west, and that the earth does move, and is not the center of the world; also, that an opinion can be held and supported as probable, after it has been declared and finally decreed contrary to the Holy Scripture, and, consequently, that you have incurred all the censures and penalties enjoined and promulgated in the sacred canons and other general and particular constituents against delinquents of this description. From which it is Our pleasure that you be absolved, provided that with a sincere heart and unfeigned faith, in Our presence, you abjure, curse, and detest, the said error and heresies, and every other error and heresy contrary to the Catholic and Apostolic Church of Rome.

Source: *“The Crime of Galileo: Indictment and Abjuration of 1633.”*

1. (Contextualization) Given what you know about the time period, how do you think the Catholic Church ruled in Galileo’s case? Why?

2. (Close reading) By the end of the trial, what was the Catholic Church’s position on the heliocentric theory?

3. (Close Reading) What two reasons did the Church give for declaring Galileo was a heretic?

Document D: *New York Times* Article (Original)

Moving formally to rectify a wrong, Pope John Paul II acknowledged in a speech today that the Roman Catholic Church had erred in condemning Galileo 359 years ago for asserting that the Earth revolves around the Sun.

The address by the Pope before the Pontifical Academy of Sciences closed a 13-year investigation into the Church's condemnation of Galileo in 1633, one of history's most notorious conflicts between faith and science. Galileo was forced to recant his scientific findings to avoid being burned at the stake and spent the remaining eight years of his life under house arrest.

John Paul said the theologians who condemned Galileo did not recognize the formal distinction between the Bible and its interpretation.

"This led them unduly to transpose into the realm of the doctrine of the faith, a question which in fact pertained to scientific investigation."

Though the Pope acknowledged that the Church had done Galileo a wrong, he said the 17th-century theologians were working with the knowledge available to them at the time.

Source: *"Vatican Science Panel Told by Pope: Galileo Was Right."* New York Times, November 1, 1992.

1. (Close Reading) Why did Pope John Paul say the Church's treatment of Galileo was wrong?
2. (Contextualization) Why was it easier for the Church to side with Galileo in 1992 than in 1633?