

The retrial of Galileo

Author: Joan Soloman



INTRODUCTION AND SYLLABUS

The aim of this piece of classroom drama is to illustrate how difficult it is to understand a new theory or to overturn an old theory which has become a part of society's way of thinking. The purpose is not to take sides either for Galileo or against him. The most probable 'verdict' of the court is just what history recorded in 1633. At all events it should show how isolated Galileo was, and the pressures upon him to recant. The unit has been used successfully in a variety of contexts including general studies, AS science and technology in society and specialist physics courses.

SCIENCE, TECHNOLOGY AND SOCIETY

This unit can be used to help students to:

- » Appreciate the relationship between scientific theories and the prevailing personal beliefs, ideological commitments, and the general cultural milieu of the period in question,
- » Increase their understanding of the historical development of scientific theories and of society's view of science,
- » Appreciate that it is not possible to 'prove' that a theory is correct,
- » Reflect on the importance of the freedom of scientific speculation.

USING THE UNIT

TIMING

The actual cross-examining of the witnesses, the summing-up, and the vote, usually take little more than half an hour. Prior to this, students will need time to become familiar with the background to the event and to study their scripts. Some discussion after the verdict is also valuable.

Teachers trialling the unit usually took about an hour in class with 30-60 minutes of private study beforehand.

A SUGGESTED APPROACH

It is a good idea to teach a little about the old Ptolemaic theory, about what Copernicus achieved, and what Galileo saw through his telescope and how he interpreted it, before you run 'The retrial'. The information needed is in Space Cosmology and Fiction pages 5-17. However the briefs for the witnesses each contain enough information for those involved to understand their own part.

PROCEDURE

Divide the class into eight groups of one, two or three, depending on the numbers, and give each group one of the scripts to study and discuss. The groups will need time to master their parts.

They should be asked to work together for a while before deciding which individual will take on the part in the trial. Whoever does so will rely on all the points raised in discussion when answering the questions posed by the Inquisitor.

It may seem as if only one of the witnesses, the Duchess, can be taken by a girl but tell the class to cast for the various roles without bothering about the sex of the characters. They could even just toss a coin to see who gets the speaking part.

Spend a few minutes arranging the 'court'.

Appoint a 'Clerk to the court' who will call the witnesses in turn.

All the class become members of the court when not giving evidence so



that, when asked to give their verdict all, except Galileo, may vote.

The Inquisitor will need a complete set of scripts in order to know just what each witness knows. The questions at the bottom of the sheet show what answers the witness will have prepared. But the Inquisitor may decide to go further, asking questions which they can answer from the middle or even the top portions of their scripts if they are likely to be able to manage it. Two or three minutes of questions is usually quite enough for each person. The Inquisitor is not expected to be impartial in a modern sense, but may be paternal to some of the witnesses, and stem with others.

This enactment has worked well with the teacher taking the part of the Grand Inquisitor, maybe wearing a gown and hood to set the scene and add an extra touch of drama.

THE CHARACTERS

- **Witness 1 (A simple farmer - Easy)**

Might even be a humorous character if the student sees it like that.

- **Witness 2 (A priest - Easy)**

A simple, rather holy person.

- **Witness 3 (Friend and disciple of Bruno, the heretic - Fairly Easy)**

He is clearly afraid. The death of Bruno at the stake in 1600 certainly made an impression on Galileo.

- **Witness 4 (Duchess Christina of Tuscany - Fairly Easy)**

A noblewoman who might have attendants with her.

- **Witness 5 (Cardinal Bellarmine, an historical character - Difficult)**

He was a real scholar as well as an influential cardinal. The Clerk might tell the court to rise when he enters.

- **Witness 6 (Papal Nuncio, taking a hard line - Fairly Difficult)**

The court must rise when he enters and it would be a good idea to ask beforehand for this actor to bless the court when he enters. He may not have actually attended the real trial but his job here is to explain the apparent cruelty of the Church. Torture and burning are not cruel if they prevent worse punishment in the world to come.

- **Witness 7 (The travelling scholar - Difficult)**

The purpose is to hear a voice arguing for freedom for speculation. He is a 'modern'. On the other hand he knows that he cannot be sure that any-one theory is absolutely right. The Inquisitor might push him on this point and show the court that even a foreign scholar will not fully endorse the truth of Galileo's ideas.



THE RETRIAL OF GALILEO

WITNESS 1: A FARMER

You are a prosperous farmer living near Rome. You work hard and have been successful through your own efforts. This has made you self-confident in most of your business dealings despite your own lack of education. You don't read much but have heard of this Professor of Mathematics, Galileo Galilei, who has been arguing that the Earth moves round the Sun, instead of the Sun moving round the Earth. You have heard stories about a magic glass through which Galileo sees strange magic sights, but it may be a trick.

The whole theory seems laughable to you. You can see the Sun rise and set, and move across the sky - just like the Moon does.

You can feel the Earth unmoving underneath your feet.

You have heard a 'scientific' argument that if the Earth were moving, and you threw a ball straight up into the air, it would fall behind you. You know this does not happen so this proves that the Earth does not move.

NOW DECIDE

1. Your name and family
2. What you grow on your farm
3. Your personal reactions to Galileo
4. How you will present your ideas to court



THE RETRIAL OF GALILEO

WITNESS 2: A PRIEST

You are a priest in a small village outside Florence where Galileo has been living. You care very much about the faith of the people in your village and that they should lead good and happy lives. Often the villagers suffer and sin, sometimes the apparently innocent die and the sinners grow rich. You teach that it will not be like that in heaven where everyone will get their just rewards. You have heard that Galileo believes the Earth is not at the centre of the universe, and that the Moon and the planets are rather like the Earth. Even the Sun is said to have spots on it.

You believe that only the Earth is full of original sin. The rest of God's creation is perfect.

Only by belief in Christ it is possible to overcome sin and be rewarded in the world to come.

The death of Jesus Christ which redeemed sinners must have taken place at the centre of the universe, so the Earth is at the centre.

NOW DECIDE

1. Your name
2. The sermon you preached last Sunday
3. Your feelings towards the villagers, and particularly the children
4. Your feelings towards Galileo

THE RETRIAL OF GALILEO

WITNESS 3: A FRIEND OF BRUNO

You are a friend and; disciple of Giordano Bruno who followed the teaching of Copernicus. He believed that the Sun was at the centre of the universe, and that the Earth and planets go round the Sun, because the calculations of the orbits seems to show it. Bruno also believed that, because the other planets were like the Earth and the other stars were like the Sun, there must be many inhabited planets. Bruno was a monk and he added to this a belief that many different Christs must have lived, and died to save these different populations. Bruno was condemned by the Holy Inquisition in 1600 and was burnt to death at the stake. You too have been persecuted and are very frightened.

You are secretly delighted that Galileo has popularised Copernicus' theory.

It seem to you that the Sun's heat and light are a symbol of God's power, and so it should be at the centre of the universe.

People should be free to imagine the works of God as they want to.

NOW DECIDE

1. Your name. Are you a monk too?
2. Your reactions to giving evidence in front of the Holy Inquisition, are you afraid?
3. Do you consider yourself a catholic or a christian?



THE RETRIAL OF GALILEO

WITNESS 4: DUCHESS CHRISTINA OF TUSCANY

You are Christina, the Grand Duchess' of Tuscany. Your family employs Galileo to be Chief Mathematician at the University of Pisa and pays him a good salari When he first got into trouble with the Church you supported him, and he wrote a long public letter to you stating his position about scientific freedom of thought. He has shown you marvellous sights through the telescope he made for you. You have seen tiny spots of light, the four moons of Jupiter which he named 'Medicean planets' after your family. You have seen mountains and seas on the Moon and even the planet Venus like a miniature new moon - a crescent shape - when it was on the same side of the Sun as the Earth.

You believe that learned professors, like Galileo, should not be told what to believe.

You believe that 'seeing is believing', so the telescope proves Galileo is right.

As his employer you consider scientists like Galileo are worth their salary: his telescope may be a real help for trading ships.

NOW DECIDE

1. When did you first meet Galileo?
2. What did you think of him?
3. Do you think science has anything to do with religion?
4. Does it annoy you that the inquisition interferes with the work of your chief scientist?

THE RETRIAL OF GALILEO

WITNESS 5: CARDINAL BELLARMINE

You are Cardinal Bellarmine a very important person in the Church. You have read the books of both Copernicus and Galileo. You understand the mathematics and are glad that Copernicus' work makes it easier to calculate the dates of the calendar which had got badly out of step before his time. You are horrified that Galileo now wants to believe in it. The Bible tells us that the Sun moves across the sky, so that must be the truth. You have written to Galileo several times warning him to pay attention to the words of the Bible and the teaching of the Church. You support the idea of banning Copernicus' book so that it does not give people false ideas.

You deeply believe that the Bible is word by word, God-given truth.

If someone rows away from the shore it may look as if the shore is moving away -but that is not the real truth, any more than Copernicus' theory is.

It is the duty of the educated people to support the faith of the simple, not to destroy it.

NOW DECIDE

1. When did you first want to go into the church?
2. What was your own upbringing like?
3. Would you be willing to look through Galileo's telescope?
4. Do you believe in the devil?



THE RETRIAL OF GALILEO

WITNESS 6: THE PAPAL NUNCIO

You are the Papal Nuncio, a personal messenger from the Pope and also a cardinal. The Pope was once a friend of Galileo so, when he became Pope, Galileo had travelled to Rome to ask permission to write a book explaining the two different theories of the universe - the old earth-centred theory and the new sun-centred theory. After some thought the Pope had given him permission but only on condition that he showed the old view was right. When the Pope read the book he was furious because Galileo had poured scorn on the old view - the one the Church held to be true. You are here to insist on obedience to the Pope.

You have read the book. It is written as an argument between three men and 'Simplicius' is the name given to the supporter of the Pope's view!

You believe that all people are subject to God's Church, otherwise they are heretics.

The suffering of heretics who do not repent goes on for ever and is quite terrible to think of.

NOW DECIDE

1. What is your name?
2. What are your personal feelings towards the Pope you serve?
3. Are you often present at inquisitions?
4. Do you consider yourself a cruel man?

THE RETRIAL OF GALILEO

WITNESS 7: A TRAVELLING SCHOLAR

You are a professor of astronomy from another part of Italy. When young you were taught the old Greek view that the Sun, the Moon and all the planets were carried around the Earth by crystal spheres moved by the hand of God himself. Then you read Copernicus' book and Galileo's, and even looked through his telescope when it was on public exhibition. You have also read some interesting news from Denmark which shows that the comet which was visible some fifty years ago actually went through where the old crystal spheres were supposed to be. Friends of yours in England and Germany write to you about some very new ideas that it may be magnetism which makes the planets move.

You like Galileo's theory and his evidence and feel fairly convinced by it.

On the other hand you think we would be able to tell if the Earth were moving by the changing position of the stars.

You want to go on working on all the theories available.

NOW DECIDE

1. Your name and age?
2. Where were you educated and have you travelled abroad?
3. Do you know Galileo personally?
4. What is your attitude towards the church?



THE RETRIAL OF GALILEO

WITNESS 8: GALILEO

You are Galileo himself. As a young man you were well educated in theology, medicine and mathematics. You also read some books by ancient Greek philosophers which had only just been found, and you found out that there were different ideas in science even then. You also read the work of Copernicus. You have been interested in many different sciences during your life, from the firing of guns and the strength of different materials to how fast things fall and how the stars and planets move. You have performed more experiments than anyone before, using a pendulum to time falling objects, and making your own telescopes. Your friends often warned you that this trouble would happen. You are now seventy and nearly blind, but there are still books you want to write about your other scientific ideas.

You have always considered yourself a good Catholic, and your favourite daughter is a nun.

You feel quite convinced that you are right about the Sun and the Earth.

You are already in pain.

NOW DECIDE

1. How frightened are you?
2. What arguments will you use?
3. Who are your friends?
4. How can you best win the church over to letting you continue as a scientist?