Life of Galileo
By Bertolt Brecht
Adapted by David Edgar

Resource Pack
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Education Officer
The Life of Galileo
Resource Pack

Introduction
This resource pack is designed to be a study aid for students coming to watch The REP’s production of ‘Life of Galileo’. It aims to provide a useful introduction to the themes, influences and theatre techniques explored in Brecht’s original text, as well as prepare students for this new production. The pack also contains a series of questions and exercises designed for students and teachers to explore after watching the production.

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With much thanks to the following
Dr Jonathon Neelands and Duncan Fewins
Tim Ford
Sara Crathorne
Stephanie Falkiner
Who was Galileo and what did he do?

Born Galileo Galilei, his main contributions were, in astronomy, the use of the telescope in observation and the discovery of sunspots, lunar mountains and valleys, the four largest satellites of Jupiter, and the phases of Venus.

In physics, he discovered the laws of falling bodies and the motions of projectiles.

In the history of culture, Galileo stands as a symbol of the battle against authority and for freedom of inquiry.

Galileo and Aristotle

Galileo believed that Aristotelian physical theology limited scientific inquiry. One of the first times he is thought to have demonstrated his contrasting theory was in Pisa, where he is reported to have shown his students the error of Aristotle's belief that speed of fall is proportional to weight, by dropping two objects of different weight simultaneously from the Leaning Tower. His contract with the university was not renewed in 1592, probably because he contradicted Aristotelian professors. The same year, he was appointed to the chair of mathematics at the University of Padua, where he remained until 1610.

Galileo and the Copernican Model

He showed little interest in astronomy, although beginning in 1595 he preferred the Copernican theory, that the earth revolves around the sun, to the Aristotelian and Ptolemaic assumption that planets circle a fixed earth. Only the Copernican model supported Galileo's tide theory, which was based on motions of the earth.

The Starry Messenger

By December 1609, Galileo had built a telescope of 20 times magnification, with which he discovered mountains and craters on the moon. He also saw that the Milky Way was composed of stars, and he discovered the four largest satellites of Jupiter. He published these findings in March 1610 in The Starry Messenger (trans. 1880). His new fame gained him appointment as court mathematician at Florence; he was thereby freed from teaching duties and had time for research and writing. By December 1610 he had observed the phases of Venus, which contradicted Ptolemaic astronomy and confirmed his preference for the Copernican system.

Galileo and the telescope

In 1609 he heard that a spyglass had been invented in Holland. In August of that year he presented a telescope, about as powerful as a modern field glass, to the doge of Venice. Its value for naval and maritime operations resulted in the doubling of his salary and his assurance of lifelong tenure as a professor.
Who was Galileo and what did he do?

Galileo and the Inquisition
In 1624 Galileo began a book he wished to call "Dialogue on the Tides," in which he discussed the Ptolemaic and Copernican hypotheses in relation to the physics of tides. In 1630 the book was licensed for printing by Roman Catholic censors at Rome, but they altered the title to Dialogue on the Two Chief World Systems (trans. 1661). It was published at Florence in 1632. Despite two official licenses, Galileo was summoned to Rome by the Inquisition to stand trial for "grave suspicion of heresy." This charge was grounded on a report that Galileo had been personally ordered in 1616 not to discuss Copernicanism either orally or in writing. Cardinal Bellarmine had died, but Galileo produced a certificate signed by the cardinal, stating that Galileo had been subjected to no further restriction than applied to any Roman Catholic under the 1616 edict. No signed document contradicting this was ever found, but Galileo was nevertheless compelled in 1633 to trial and was sentenced to life imprisonment (swiftly commuted to permanent house arrest). The Dialogue was ordered to be burned, and the sentence against him was to be read publicly in every university.

Galileo’s Legacy
Galileo's final book, Discourses Concerning Two New Sciences (trans. 1662-65), which was published at Leiden in 1638, reviews and refines his earlier studies of motion and, in general, the principles of mechanics. The book opened a road that was to lead Newton to the law of universal gravitation that linked Kepler's planetary laws with Galileo's mathematical physics. Galileo became blind before it was published, and he died at Arcetri, near Florence, on January 8, 1642.

Galileo's most valuable scientific contribution was his founding of physics on precise measurements rather than on metaphysical principles and formal logic. More widely influential, however, were his works: The Starry Messenger and the Dialogue, which opened new vistas in astronomy. Galileo's lifelong struggle to free scientific inquiry from restriction by philosophical and theological interference stands beyond science. Since the full publication of Galileo's trial documents in the 1870s, entire responsibility for Galileo's condemnation has customarily been placed on the Roman Catholic church. It gives no mention of the role of the philosophy professors who first persuaded theologians to link Galileo's science with heresy. An investigation into the astronomer's condemnation, calling for its reversal, was opened in 1979 by Pope John Paul II. In October 1992 a papal commission acknowledged the Vatican's error.
What influenced Brecht when writing *Life of Galileo*?

Bertolt Brecht avidly supported the political views of communist leader **Karl Marx**. We find evidence of this fact in many of his works written during exile from Germany. Brecht was deprived of his German citizenship on June 8th, 1935 because of his anti-Nazi views. The author wrote plays of his exile with a distinct intention on answering particular questions. He soon moved instead to a style that left moral questions up in the air. One such play is *Life of Galileo*, first written in November of 1938 and revised in 1945.

*Galileo* was written not because Brecht showed great interest in the scientist Galileo or even his research, but because of Brecht’s interest in the subject as a case study pertaining to his own modern world. The play reflects Brecht’s **Marxist** views in its theme of working for the good of all humanity. However, it is far more a study of history’s course depending on individual responsibility. **Galileo** fully devoted himself to the search for truth, no matter who or what the cost. He pursued his research without fully examining its implications on the general humanity. Brecht found this a pressing topic of his own age.

The original version of *Galileo* ended quite differently than the revised edition. In 1938, *Galileo* is portrayed as a man who cunningly outwits the **inquisition** in order to pursue his research and smuggle his results out of the country. His cunning causes a light to dawn in an age of darkness, as Brecht saw it.

In 1945, a modern tragedy occurred as a result of scientific progress and forced Brecht to rethink the theme of his work. He revised the play’s ending after the bombing of **Hiroshima**. Brecht transforms Galileo into a weak man, who recants the truth at the mere sight of the torture instruments. He is now a coward, practicing science only for his own gain not regarding it’s possible benefit to humanity. His followers are disheartened, and perhaps the age is as dark as any other.
What influenced Brecht when writing *Life of Galileo*?

Some critics have argued that Brecht ultimately portrays Galileo, and his recanting of the truth, as being implicated in the horrors associated with the **Atomic Bomb**. Galileo denounces himself in the play’s final scenes because he has pursued knowledge for its own sake, not for the good of humanity. Pursuing truth outside the realm of human needs led to the split between science and society that Brecht felt culminated with the dropping of the bomb. Nevertheless, the play does not completely answer the problem. Brecht leaves that, as was his style, to the audience to decide.

**Q:** What do you think? Should science only pursue goals considered beneficial to society? Who should decide what benefits society? Should it be a country’s government?

**Q:** Would you agree with critics who argue Brecht is implicating Galileo in the atom bomb being dropped?

**Q** Can you think of examples of contemporary scientific ‘innovations’ which may have an adverse effect on humanity?
<table>
<thead>
<tr>
<th>Scene</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Galileo talks to Andrea, explains to him the Copernican System. Ludivico comes by to arrange private lessons. He tells Galileo about the telescope from Holland. The scene introduces the burgeoning, new scientific age Galileo is living in. Introduces Copernicus’ hypothesis. Shows the economic constrictions of Galileo’s work as a scientist.</td>
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<tr>
<td>2</td>
<td>Galileo perfects the telescope. He gives it a better scope. We learn he has stolen the idea from another scientist. The scene explores plagiarism and science. Through Galileo’s act of plagiarism we see his humanness.</td>
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<tr>
<td>3</td>
<td>Galileo’s research proves the realness of the Copernican System. The curator finds out about Galileo’s plagiarism. Galileo writes to the court in Florence. The power and the danger of ‘TRUTH’ is explored. The scene includes the speech about REASON and its seductions.</td>
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<tr>
<td>4</td>
<td>Galileo in Florence, perfects his telescope, and notes new discoveries. Galileo gets into a dispute over the truthfulness of his discoveries with the aristocrats of the Florentine court. The aristocrats (ruling classes) fear of new ideas.</td>
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<td>5</td>
<td>Galileo continues his research, the plague breaks out.</td>
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<td>6</td>
<td>The Vatican approves Galileo’s discoveries. Raises the debate whether mankind must find the answers to all questions. Raises the debate of how mankind should see itself within the order of the universe.</td>
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<tr>
<td>7</td>
<td>Ludivico and Galileo’s daughter are in love. The Inquisition indicates that it found Copernican views in Galileo’s book. Questions the scope of the Church’s responsibilities.</td>
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<tr>
<td>8</td>
<td>Galileo’s conversation with the humble monk on the conflicts between religion and science. What leads to a better life, scientific knowledge or religious faith? Can you believe in God and scientific reason?</td>
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<tr>
<td>9</td>
<td>New Pope Urban XIII. Preparation for Virginia’s wedding. Galileo’s research on swimming bodies continues. Research over blind faith.</td>
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<td>10</td>
<td>Ballad of Galileo’s deeds. Galileo is portrayed as the destroyer of the bible.</td>
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<tr>
<td>11</td>
<td>Galileo is summoned by the Inquisition. Galileo sticks to his arguments and expresses his firm belief in them even if no one else does.</td>
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<tr>
<td>12</td>
<td>The Pope does not forbid Galileo’s teachings. The Inquisitor fears loss of power and status as a result of Galileo’s teachings.</td>
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<tr>
<td>13</td>
<td>Galileo recants. Recantation or death - What is the nobler act?</td>
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<tr>
<td>14</td>
<td>Older Galileo in house arrest, a passer by gives him a duck. Andrea comes to visit. Galileo gives him the Discorsi. Research will continue even if it is forbidden.</td>
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<tr>
<td>15</td>
<td>Andrea smuggles out Galileo’s Discorsi. Symbolizes that those in pursuit of scientific knowledge will continue their research despite any restrictions imposed by the ruling powers.</td>
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The Heliocentric Theory
A Chronology of Discovery

Aristotle and the Greek Philosophers

Aristotle, a Greek philosopher, taught that the Earth was the center of the Universe. He thus taught that the Sun, the Moon, and the planets thus orbited the Earth. This is the "geocentric theory." Aristotle set forth this theory in a book called, "On the Heavens."

On the other hand, another Greek named Aristarchus of Samos in the 3rd century BC placed the Earth and other planets in motion around the central Sun. This idea, however, was rejected by the people in favour of Aristotle's geocentric theory.

Ptolemy

Claudius Ptolemy was a later philosopher who lived in Alexandria. He wrote that the Earth was motionless because constant gales would sweep across it if it were in motion. Ptolemy also devised a complex system of "epicycles" to account for the apparent retrograde motion of the planets. Retrograde means backwards. Consider two objects rotating about a common point with the inner object travelling at a faster angular speed than the outer object. As the inner objects passes by the outer object, the outer object will appear to move backwards. This effect is an optical illusion. In Ptolemy's epicycle system, each planet revolved around the earth in a large circle by making a series of smaller circles, to account for this effect.
**Thomas Aquinas**

The theories of Aristotle and Ptolemy were adopted by the Roman Catholic Church, which played an important role in presenting these theories to the Europeans. Around the year 1270, Thomas Aquinas, a priest and philosopher, used the writings of these men to show that the heavens were "God-ordained and man-centered." The Church leaders felt that they had the duty of teaching the people about the universe, which declared the glory of God.

**Nicholas Copernicus** lived from 1473 to 1543. He studied to become a priest in the University of Bologna in 1497. His religious training included astronomy, since one of his duties would be to warn the people about the future by what happened in the heavens.

Domenico Maria Novara was an astronomy professor who taught Copernicus. Domenico and Copernicus spent many nights studying the heavens together. They freely discussed ways for improving and simplifying Ptolemy's system of planetary motion.

Copernicus set out to improve the system devised by Ptolemy. He realized that the rising and setting of the Sun, Moon, and stars could be accounted for by a daily revolution of the Earth. Also, he found that if he put the Sun at the centre of the planet's orbits he could simplify the number of epicycles from 80 in Ptolemy's system to a mere 34.

Although epicycles do not exist, Copernicus' intuition was correct. His idea that the Earth and planets orbited about the sun became know as the "heliocentric theory." He wrote about it in his book "De Revolutionibus," which translates to "Concerning the Revolutions." at the same time! "Copernicus defended his placement of the Sun at the centre of the Universe by asking, "For who would place this lamp of a very beautiful temple in another or better place than this, wherefrom it can illuminate everything.

**Galileo Galilei**

Galileo Galilei came next. He lived from 1564 to 1642 in Italy. He used the newly-invented telescope to make his own observations. He studied mountains and craters on the Earth's moon, the phases of Venus, and the moons of Jupiter. Particularly he noted that Venus at times appears to be a crescent, just as the Earth's moon does. All of these findings supported Copernicus' heliocentric theory.

Galileo wrote about his observations and thus angered the Roman Catholic Church. The Church eventually placed him under house arrest. The Inquisition was the tribunal of the Roman Catholic Church at this time. The Inquisition made Galileo kneel before them and confess that the heliocentric theory was false.
Johannes Kepler was a German astronomer who lived from 1571 to 1630. Kepler was invited to live in Prague by the astronomer Tycho Brahe. Tycho died a year after Kepler's arrival. Kepler inherited a wealth of astronomical data from Tycho. Kepler used this data to draw conclusions about the orbits of the planets. For example, he found that the orbits were actually ellipses instead of perfect circles.

Newton

Isaac Newton lived from 1642 to 1727 in England. Newton derived the law of gravitation between two masses. Since the Sun was the most massive object in the planetary system, all of the planets would naturally be attracted to it and revolve around it, in the same manner as the Moon revolves around the Earth. Newton eventually wrote about gravitation and the heliocentric theory in Principia Mathematica in 1687, at the prompting of another famous astronomer, Edmund Halley. Halley used Newton’s equations to predict that a comet seen in 1682 would return in 1758. The return of Halley's comet gave final proof to the heliocentric theory.
## Brecht’s Theatre Techniques

### Stage Design
When Brecht staged a performance the set and props were only on stage if they were necessary to the telling of the story. If something was not used or spoken about then it was not needed and could therefore be dispensed with. The stage would therefore be almost bare and empty, and any set changes would be made in full view of the audience. Props themselves were often symbolic, representations rather than the real thing.

**Q:** Do you consider the set used in this production to be ‘Brechtian’?

**Q:** Do you think this set design enhances the process of ‘Alienation’? (i.e Are there any elements of it that struck you as being deliberately unreal or symbolic)?

### Lighting
The lights were to be in full view of the audience, as were their operators, to ensure that the actors were seen in the same world as the audience. Lighting was used to indicate the passage of time or to indicate the changes between scenes rather than to create mood or atmosphere.

**Q:** How do you think lighting was used in this production?

**Q:** Can you think of an example where lighting was used in a ‘functional’ style (i.e definitely not being used to create atmosphere or mood)? Did it work? Did it contribute anything specific to the production (i.e emphasis of the passing of time, or a character’s decision or dilemma)?

### Music
Rather than accompanying the action on stage music was meant to comment on or conflict with the action on stage. Brecht modelled the music in his productions on music popular with the working class, such as music hall. Brecht would often place song and music at the centre of his process of ‘alienation’, for example a happy sounding song with lyrics highlighting the difficulties of the characters lives. He wanted the music to remind the audience they were watching a performance, and to stop them becoming all consumed by the psychological motives and lives of the individual characters.

**Q:** How was music used in this production?

**Q:** Can you think of any moments where it assisted the ‘alienation’ process? How did it fit in with the other components of the show (i.e the actors, lighting, set) at that moment?

**Q:** Was the music used to comment on the actions or decisions of the characters?
**Brecht’s Theatre Techniques**

During his lifetime Brecht produced an extensive body of writing outlining his theories on acting and theatre. Outlined below are some of his core concepts.

**EPIC THEATRE**

Epic Theatre assumes the purpose of a play is not about the imitation of reality but to present ideas. It invites an audience to make judgements on the society the play represents and the decisions the characters make. Characters do not mimic ‘real’ people, but represent opposing sides of the argument. The audience should always be aware it is watching a play and should remain sufficiently emotionally detached from the action to be able to critically reflect on the actions and decisions of the characters.

**Q: Can you think of a scene which presented two opposing ideas at once?**

**Q: Did any of the characters make decisions where you thought, ‘I agree with that’ or ‘I don’t agree with that’?**

**Q: Did you find yourself thinking at any point, ‘I don’t think what happened there is fair. I don’t think that should happen in the world. I’d like to change that. What should happen in the world instead is . . . ‘**

**Alienation**

Brecht’s term ‘Verfremdungseffect’ is often translated as ‘alienation’, although a more accurate translation may be ‘to make strange’. ‘Alienation’ can be achieved in a number of different ways. An effective way of achieving it can be to mix together lots of different techniques, like songs, projections, tableaux and exaggerated physical gestures and voices. It’s aim is to make the characters decisions and choices explicit and to stop the audience having any delusion that they are witnessing a ‘real’ scene.

**Q: Can you identify any moments in the play where you felt the director and the actors had made a conscious decision to present something in a ‘unnaturalistic’ style?**

**How would you describe this unnaturalistic style, was it done technically with lights or sound, or was it done physically or vocally?**

**Q: Can you describe any moments where the performance made a character’s decision or choices explicit?**
Brecht’s Theatre Techniques

Gestus
Is an acting term coined by Brecht. His fascination with ‘Gestus’ arose out of his observations of traditional Chinese theatre. He observed in one show an actor who was required by the story to be frightened. The actor merely put a lock of his hair into his mouth. Immediately everybody in the audience knew the actor was portraying a character who was scared, yet everybody in the audience still knew they were watching an actor who was part of a theatre company who were telling them a story.

What Brecht liked about the Chinese actors approach to making theatre is that their characters were not hard to understand. The audience knew exactly what they were feeling at any given moment. Therefore the audience could get on with forming an opinion on what the characters did in the story not puzzling over how they were feeling.

A helpful way of thinking about ‘Gestus’ is that it must be ‘quotable’. You should be able to come out of the theatre with a clear memory of how an actor physically and vocally represented a character. You should be able to do an impression of them. However, ‘Gestus’, should not be about stereotypes. A character’s ‘Gestus’ must directly relate to their social status and attitude in the play.

In rehearsals Brecht worked a bit like a sculptor, working for hours with his actors to get the right ‘Gestus’ for their character. Brecht was interested in showing the many different contradictory sides of his characters. He wanted his audience to be aware of how people change depending on their situation and social circumstances. Therefore, whilst having an overall ‘gestus’ within the play, Brecht would work with his actors to clearly create different ‘gestus’ for different individual moments in the story.

‘Gestus’ obviously sounds a bit like the English word ‘gesture’. Gestures and what an actor does physically are an important element of ‘gestus’. However, Brecht uses the term to encompass a lot more then just a character’s physicality. ‘Gestus’ should encompass and present to the audience the characters social status and their social attitude and relationship with the characters around them.

Q: After watching the production which characters can you do an impression of? How would you describe how they used their bodies and voices?

Q: Do you think the actors in this production were particularly aware of the concept of ‘gestus’? Do you think they achieved what Brecht describes the Chinese actor as achieving, an absolutely clear emotional state and social attitude?

Q: What do you think ‘gestus’ contributes to an audiences experience of a production?
Brecht’s Theatre Techniques

**Structure**
Ideally, each element of the play should operate independently. Every scene must tell its own story and carry its own message. Each scene must have a clear beginning and end.

Q: Did you feel you were watching one continuous story, or could you identify beginnings and ends of scenes?

Q: How did this production mark the end of one scene and the beginning of another?

**Suspense**
Epic theatre strived to avoid any sense of suspense. Brecht didn’t want his audience to be trying to guess what was going to happen in a scene, he wanted them to struggle with why things that happened in a scene happened. In his productions many scenes were introduced with a projected title or a brief song which would give a clear description of what was going to happen in the scene.

Q: How did this production introduce action?

Q: Do you think this production avoided ‘suspense’ or can you identify moments where you were wondering what was going to happen to a character?

**The Storyteller Actor**
Brecht didn’t want his actors to ‘live’ or ‘be’ the characters. He wanted his actors to ‘represent’ the characters they were portraying. In rehearsals, to help his actors achieve this objectivity, he would encourage them to speak in the third person, the past tense and say their stage directions. Another technique he employed was to show the actors changing costumes, to take on different characters roles, in full view of the audience. He’d also encourage the actors to speak directly to the audience to highlight difficult choices and decisions made by the characters in the story. All of these techniques were used to remind the audience the play wasn’t ‘real’ and the actors were not attempting to ‘be’ the characters they were representing.

Q: Did you see actors play multiple roles in this production?

Q: Can you think of any moments where an actor used a ‘non-realist’ acting techniques to draw your attention to what was happening in the story? How effective did you think this was?
Drama Exercises

Warm Up: Brain teasers
It was essential to Brecht that his actors were alert and able to use their brains whilst performing. Here are some exercises designed to wake up the cerebral functions! They get progressively harder. It is very unusual for people to be able to do each step at their first attempt.

- Everybody find their own space in the room.
- Raise your arms up to shoulder height and point your index fingers in front of you. Make two large circles in the air in a clockwise direction.
- Adopting the same position make one circle with the left hand in a clockwise direction and one circle in an anti-clockwise direction with the right hand.
- Adopting the same starting position make one small circle with the left hand and a large circle with the right hand.
- Make a circle with your foot at the same time as making one with your finger.

Exploring Gestus — The Folding a sheet Exercise
This exercise can form a good starting point for exploring what ‘gestus’ is.

- Get into pairs. Together practice miming folding a sheet. Eye contact and concentration are essential to the early stages of this exercise. You must work together and you are aiming to develop a definite rhythm that suits both of you. The rhythm should not be too complicated as you want the sheet folding to look as clear as possible.
- Decide who is A and who is B.
  A is very loyal to the people who own the sheet.
  B is very disloyal to the people who own the sheet.
  A and B are going to have an argument as they fold the sheet.
- A and B’s task is to keep the sheet folding rhythm exactly the same as the argument escalates. The taxing element of this part of the exercise is raising your vocal energy without raising your physical energy. It can often be useful to discuss how students found this exercises before moving on.

- Next, you are going to have a short time on your own to explore your loyal/disloyal characters.
  (i) On your own imagine you are walking around the house of the sheet owners. How do you walk? How do you sit down? How do you react to a locked door?
  (ii) This time when you walk you are going to have a constant dialogue running with yourself. You don’t need to speak to anyone else, but you are going to comment on everything you see and think.
  (iii) Rejoin your partner. It is the moment just before your character picks up the sheet. How do they stand? Where are their arms, feet? What angle is their chin, nose or buttocks?
  (iv) You and your partner are going to fold the sheet again. You must keep the same rhythm you agreed at the beginning of the exercise. This time you must stick to the physical and vocal decisions you made during the last step. So, if you have decided that they have a high voice and a jutting chin your acting must remain true to these decisions.
Drama Exercise

Gestus continued

- In this last step you and your partner are allowed to break out of the activity of folding the sheet. Your acting must remain true to the physical and vocal decisions you made previously. If you decide to interrupt the sheet folding you must be aware that ultimately the sheet must be folded by the conclusion of the scene. When you return to folding the sheet the same rhythm must be maintained.

One of the factors that this exercise can demonstrate is that ‘gestus’ is not simply about gesture. It is a whole way of being. Creating ‘gestus’ is a highly selective and honed process. Gestus is ‘Everything you say and everything you do’.

Exploring Social Relationships

Everybody walks around the space. The facilitator will call out descriptions of characters. Members of the group must create these characters as quickly as they can. In this exercise participants are encouraged to interact with each other in character.

- A woman begging for food
- (In pairs) Fellow worker greeting fellow worker in the street.
- (In pairs) Bank employee to bank employee.
- (In a group of 7), Children trying to get a look at the bosses car.
- (In groups of 7), Strikers at the gate to the factory

Each improvisation shouldn't run too long, a minute at the most. This exercise is about spontaneity.

Exploring ‘Dialectics’

Brecht was a Marxist and Marxists believe that nothing in the social order is unchangeable. Marxists believe that the powerful classes try and make the organisation of society look ‘natural’ and ‘unchangeable’, so that those oppressed by the powerful feel powerless to change things. Therefore, in his theatre Brecht always wanted to highlight opposing points of view and contradictions that clearly showed that a situation was not fixed and could be changed. Therefore, often each character is made up of a set of contradictions and opposing beliefs, as is each scene. In this next exercise we are going to explore some of the opposites in Life of Galileo.

Students should work in small groups. Each group is given the list of dialectics and two quotes. The quotes represent opposing views to a subject explored in the play. The groups must select one of the dialectics to combine with their quotes. They must decide on an appropriate ‘attitude’ for each quote. For example, they may have chosen Courage and Cowardice. Their quote will be spoken with the chosen ‘attitude’ (Courage or Cowardice) in the voice of the speaker. The students are going to present back their quotes to the other groups. They must create two still images to go with their quotes. Therefore, the final presentation will combine image and the spoken attitude. It is up to the students to decide whether people in the images speak the lines or whether they have narrators saying the lines. It is also up to the students how they move from one picture to the next.

The Dialectics of Galileo

- Patience and Impatience
- Courage and Cowardice
- Pride and Servility
- Sobriety and Enthusiasm
- Acumen and narrowmindedness
- Affability and tactlessness
- Gentle humour and acerbic irony
- Commitment and cynicism
- Democratic ways and kowtowing to the nobles
- Love of truth and betrayal of truth

(The Dialectics of Galileo by Ernest Schumacher, TDR 38, 1968)
Group 1
Galileo: . . . Who takes big steps is given big boots. One must move with the times, gentlemen. No hugging the coast; sometimes you must put out to sea. (Scene vii)

Virginia: He does nothing against the rules. His repentance is genuine. I watch over him. (Scene xiv)

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Group 2
Galileo: I say to you: he who does not know the truth is merely an idiot. But, he who knows it and calls it a lie, is a criminal. Get out of my house! (Scene ix)

Voice of the Crier: I, Galileo Galilei, teacher of mathematics and physics at The University of Florence, renounce what I have taught, that the sun is the centre of the universe and motionless in its place, and that the Earth is not the centre and not motionless. (Scene xiii)

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Group 3
Galileo: The movement of the stars has become clearer; but to the mass of the people the movements of their masters are still incalculable. (xiv)

Galileo: A man such as I can only obtain a moderately dignified position by coming crawling on his belly. And you know, I despise people whose brains are not capable of filling their bellies. (iii)

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Group 4
Galileo: . . . In this respect the pursuit of science seems to me to require particular courage. It is concerned with knowledge, achieved through doubt. (xiv)

Galileo: I recanted because I was afraid of physical pain. (xiv)

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Group 5
Galileo: I maintain that the only purpose of science is to ease the hardship of human existence. If scientists, intimidated by self-seeking people in power, are content to amass knowledge for the sake of knowledge, then science becomes crippled, and your new machines will represent nothing but new means of oppression. (xiv)

Galileo: Your excellency, noble Signoria! As a teacher of mathematics at your University of Padua and director of your great arsenal here in Venice, I have always regarded it as my duty not only to fulfil my high responsibility for teaching, but also to provide especial benefits for the Republic of Venice by means of practical discoveries. With deep pleasure and all humility I am able to present to you here today a completely new instrument, my distance glass or telescope. (ii)

(Note: Galileo stole the idea of the telescope, which was first invented in Amsterdam by Hans Lippershey)
Exploring the science of Galileo

Students should work in small groups. Their first task is to read through the following extract from Scene One.

Andrea: But I can see that the sun is in a different place in the evening from where it was in the morning. So, it can’t be standing still. Never, never.
Galileo: You see! What do you see? You see nothing. You only goggle. Goggling is not seeing. (He sets the iron wash basin in the middle of the room). Well, that’s the sun. Sit down. (Andrea sits on the one chair. Galileo stands behind him) Where is the sun, right or left?
Andrea: Left.
Galileo: And how can it get to your right?
Andrea: If you carry it to the right, of course.
Galileo: Is that the only way? (He picks him up with the chair and rotates him through a semicircle). Now where is the sun?
Andrea: On the right.
Galileo: And did it move?
Andrea: No! It didn’t.
Galileo: Well, what did move?
Andrea: I did.
Galileo: (shouts) Wrong, you idiot! The chair.
Andrea: But I went with it!
Galileo: Of course you did. The chair is the earth. You are sitting on it.

1. Students should spend a couple of minutes exploring and debating the scientific principle explored in the scene. The students should be encouraged to get up on their feet and walk through what Galileo is describing.
2. Their next task is to create a version of this scene in which each member of their group is actively involved. Their task is to make the scientific principles of the scene as clear as possible to their audience. They are going to present this scene back to the other group members. They must stick to the words in the script but the students should be encouraged to use theatre techniques they think make the science as clear, visible and engaging as possible, for example actors playing the sun and the earth.

About REP Education
Rep Education runs a varied programme of activities for students and teachers, including Theatreday workshops at The Rep and practical drama workshops in schools. For more information please contact our Education Officer on 0121 245 2093 or at juliet.raynsford@birmingham-rep.co.uk
Interview with Jonathon Church
Director

Why have you chosen to direct Life of Galileo?
We have a very large main stage here at The REP and I’m always looking for writers whose texts are suitable for our space. Also, I haven’t directed a Brecht play before and I thought it would be an interesting challenge. I read through a number of his plays. Some of them I knew a bit, like Mother Courage and Caucasian Chalk Circle, but Galileo was unknown to me. What I found surprising was how un-Brechtian Galileo was. Galileo has a very strong emotional drive to it, that allows characters to develop in a much more Stanislavskian way. I was interested in working with Brectian techniques, but ultimately I chose Galileo because I felt it would be the most accessible Brecht text for an audience.

What do you think are the challenges facing a director working on a Brecht play?
Well, there will always be expectations of a Brecht play, because of his status as a theatre practitioner and what he achieved in his lifetime. For me the joy rather than the problem is how filmic Brecht’s work is. He wants his work to be seen against an epic background. I also like the way with his use of titles he is making you look at each scene in isolation, and often focusing the audience specifically on the aspect of the scene he wants you to consider. I find that quite refreshing, because it is challenging to approach a play from that questioning perspective. He wants us to consider A plus B and see if we think it equals C. As a director you are trying to illustrate a point rather than create a situation where your audience discover it. This is a very different dramatic process. When directing Brecht its all about ‘underlining’, which points of the argument or questions are you going to underline and how. In the end our decisions about what were considered the important arguments in the scene didn’t affect how we went on to rehearse and perform the scene. In our rehearsal process this was still character led.
The other thing is there is a perception of Brecht as ‘heavy’, and everything about this new translation is about cutting out repetition, and being aware of humour. The other important thing I wanted to do with this production relates to the music. Eisler did the original music, working closely alongside Brecht. Its fantastic music but we got permission to create our own original score, which I feel has given the piece a distinctive style.

Brecht wanted his theatre to make his audiences ‘think’, how important was this to you?
We were conscious of wanting to make the audience think. I think a major factor for us was encouraging the audience to contemplate the major force religion is becoming in our world. Instead of being a play about state versus science I think our version has become much more a play that explores the concept of religion versus science versus truth.

Brecht couldn’t of imagined a world where communism wasn’t a force. Communism is now a spent force in the world. It’s arguable that to Brecht imagining a world where religion was such a significant force may have been difficult. He used the Catholic Church to represent the Communist state. Communism and religion are now viewed, fifty years on, differently. Brecht was constantly rewriting and revising his plays to reflect the changing political and social events of his times. It’s these factors which were central to us working on a new translation of his play. When we were working on the new pieces of music, their lyrics and how the chorus were going to perform them we wanted it to be quite clear that they were commenting from a contemporary perspective. We wanted to be clear this chorus represented the people, the working class. They refer to themselves at one point as ‘the skivvies’. I see their role as to look at and comment on how science and scientific discovery affects the man and woman in the street. They say at one point, ‘You’ve got to remember in all this science you and I were left behind’.
I also think what happened with Gurpreet Kaur Bhatti’s play Behzti at The REP last year is relevant. That one group of people can try and surpress the expression of someone’s ideas, or send out the message you can prevent your ideas but only as long as you pretend your beliefs are not a fact. It’s alright all the time you are saying something as a hypothesis. One of the most subtly insidious parts of the play is when the Cardinals say to Galileo that he can continue to pursue his scientific research as long as its only theories and hypothesis, its only when you try and tell the people it is a truth that we will intervene.
It was important to me though that the play did not become a lecture. It must tell a story and it must engage its audience.

How conscious have you been of Brechtian technique in rehearsal?
Not very conscious. I think some of that is because of how David Edgar has adapted the script. This can be illustrated by what he’s done with the clerics. In the original the clerics were there to represent the state and often get portrayed in a very satirical and flamboyant style. What David has tried to do is make them a more genuine threat. So, potentially some of the satirical bite that Brecht intended has been deliberately removed, as we’ve pushed the more linear narrative. The mathematician and the philosopher who argue with Galileo about what he can see through his telescope without actually having a look themselves could be extremely funny but we have decided to play it highlighting the threatening aspects of these moments.
Interview with Timothy West

Q: Have you been in a Brecht play before?  
Actually, the only other time I’ve performed in a Brecht play was in a production of Galileo at The Mermaid. It was a long time ago now, and I had a small part. That production was closely based upon the original Berliner Ensemble production.

Q: How much research did you do on the science explored in the play?  
I’m fond of research and always like to apply myself to it. Even though you end up throwing a lot of it away. We had a physicist and a member of the Catholic church come in to rehearsals to debate some of the theories with us.

I’m comfortable with the majority of the science in the play, especially the astronomical science. The scene I feel Brecht hadn’t really thought through was the one in which the needle is floated upon the water. I don’t think it's clear. It’s an experiment I’ve done quite a lot now. Making it work is all to do with the surface tension of the water. I very rarely manage to make it work in the show. I think it’s to do with the weight of contemporary needles compared with older ones.

Q: What intrigues you about the character Galileo?  
His intellectual energy. His belief that in the end it will all come right. His belief that if you have proof for something people will believe you. His weaknesses for the comforts of the flesh juxtaposed with his distaste for the distress of the flesh. And ultimately, how his burning intellectual ambition was defeated by physical fear.

Q: How conscious were you of Brechtian techniques during the rehearsal process?  
Not conscious at all! Brecht wasn’t true to his own stated theories anyway. Simply, because he is too good a playwright. Scholars talk all the time about Brecht’s concept of ‘alienation’, but there is an excellent example in this play of how Brecht blows a hole within his own theory during the recantation scene. The people are waiting to hear the sound of the bells at five o’clock. Five o’clock comes and goes and there are no bells. They rejoice that Galileo hasn’t recanted and just as we’ve relaxed into that idea the bells toll. A fantastic moment of dramatic shock that blows right through to the heart.

Helene Wiegal, Brecht’s widow, came to see the original production of Galileo I was in. After the show our director asked her how well she felt the production had achieved a process of ‘alienation’. She replied, ‘Oh you don’t want to get too obsessed with all that ‘alienation’ stuff, it was something Bert invented to protect himself from self-indulgent actors’.

What do you think are some of the most challenging aspects of playing a role like Galileo?  
The size of the part. It’s longer than most of the major Shakespeare protagonists. I’m not off the stage in the first half of the play. So, your task as an actor becomes to plan your role orchestrally. To pace yourself and understand the rises and falls of the journey your character is undertaking. You must make sure it is truthful psychologically, clear argumentally and interesting dramatically.

What issues do you think Life of Galileo raises for a contemporary audience?  
What are the responsibilities of scientists in terms of their society, and vice versa, how should society support scientists with their research. How can scientists work towards their pursuit of knowledge without being hijacked by social, political and economic factors. When Brecht wrote Galileo he felt the Church was over, and would continue to seriously decline in term of its impact on the people. In 2005 we are experiencing something very different to that. Fundamental religion is a significant factor in our society and sometimes it can feel like common sense is thin on the ground.