Name: _____ Class: _____

Galileo's Starry Night

By Kelly Terwilliger
2019

Galileo Galilei (1564-1642) was an Italian scientist and inventor. In this text, Kelly Terwilliger explains his important work. As you read, take notes on Galileo's discoveries.

[1] On a warm June evening in 1609, Galileo Galilei, a 45-year-old Italian mathematics teacher and father of three, listened as a friend described the latest invention to hit Europe: a long tube containing two glass lenses, called a spyglass.

"It makes faraway things appear close! We could use one of those here in Italy," the friend said. "Perhaps you could try to build one, if you're interested."

Was he ever! Galileo loved trying to figure out how the world and the things in it worked. That very night he leaped into the project with gusto. In a short time, he not only figured out how to build a spyglass, he improved upon the existing[1] model as well.

"Galileo Galilei painting.jpg" by Peter Paul Rubens is in the public domain.

When he later presented his device[2] to the rulers of Venice, they marveled at how far it could see. The spyglass would be quite useful for spotting distant enemies, making it hard for anyone to launch a sneak attack!

[5] Galileo wasn't satisfied, however, and he kept fiddling with his "telescope," as his fellow mathematician friend Giovanni Demisiani had called it (the word means "far-looker.") He tried new adjustments[3] and worked at grinding better lenses. Within a few months, he had a telescope that was three times more powerful than his first.

---

1. **Existing** ***(adjective)*** already in use
2. **Device** ***(noun)*** something that is made for a clear purpose
3. **Adjustment** ***(noun)*** the act of making small changes to something

By now, autumn had arrived, and evenings darkened early. One night as the moon rose, Galileo pointed his telescope toward the sky. If it could see far on Earth, why not into the heavens as well? Who knew what the moon might look like close up?

What Galileo saw astonished him. The moon was not perfectly smooth, as it appeared to the naked eye. It was a bumpy moon. Its edges had "ridges of darkness" and "pips of lights," and it was covered with what looked like craters, mountains, and valleys. Entranced[4] by these unexpected details, Galileo drew picture after picture of what he saw through the telescope.

A craggy moon wasn't all that he discovered. Galileo could now see that the Milky Way, seemingly a bright cloud across the sky, was in fact made of millions of stars. He also noticed that while fixed stars of constellations looked like twinkling lights, the "wandering stars," or planets, seemed to be solid spheres[5] — like the moon.

All through that December, Galileo peered into the night sky at what had never been seen before. Sometimes his hands shook with the cold. The chilled lens of his telescope fogged up whenever he put his eye near the glass, and he had to keep wiping it clear.

[10] On January 7, 1610, Galileo focused his gaze on Jupiter. He noticed three bright stars beside it and drew a sketch of them. The next night he looked again. The three stars had scooted to new positions! How odd, he thought. The following night, Galileo saw only two stars. What was going on? A few nights later he saw four. Galileo kept watching and recording his observations[6] until he concluded that these dots were neither stars nor planets — they were little moons, circling Jupiter!

Galileo wrote down his observations and thoughts in a book called *The Starry Messenger*. The book immediately sold out. People were very excited — and troubled — by his discoveries.

Little moons circling not Earth, but Jupiter? Our own moon, a bumpy one? Sightings like these could change how people thought about the universe.[7] Some skeptics[8] chose not to look through the new telescopes; others refused to believe what they saw. They insisted that Galileo put specks in his telescopes to trick people.

Feverishly, Galileo built more telescopes, hoping to make the truth visible[9] to everyone. But what kind of truth was this? Could you really trust a telescope? And what did it all mean?

---

4. **Entranced** ***(verb)*** totally amazed by
5. a round, three-dimensional figure; like a ball
6. **Observation** ***(noun)*** the act of noticing or seeing
7. **Universe** ***(noun)*** all matter and space, including the earth and heavens
8. **Skeptic** ***(noun)*** one who doubts others
9. **Visible** ***(adjective)*** able to be seen

These early telescopes weren't perfect, but what they showed was true enough: the heavens were not "flawless," nor did they revolve[10] around the earth, as many believed. Instead, it looked like the many planets, including Earth, revolved around the sun.

[15] Those who lived in the 1600s were not quite ready for this scientific breakthrough. At the time, many people passionately believed Earth should be at the center of the universe. Galileo was ordered to stop writing about his observations and was imprisoned in his house. He was put on trial,[11] and his books were banned[12] for two hundred years.

However, people had already begun to see what they had not been able to see before, and they started to ask questions. While some refused to let go of their old ideas, new and marvelous mysteries and discoveries awaited those who did.

10. **Revolve** ***(verb)*** to turn or spin in a circle
11. **Trial** ***(noun)*** a way to figure out if a person has done something against the law
12. **Ban** ***(verb)*** to forbid or have an official rule against; prohibit

Text-Dependent Questions

Directions: For the following questions, choose the best answer or respond in complete sentences.

1. What is the main idea of the text?
    A. Galileo Galilei made the first telescope to show that space was just how we had imagined it.
    B. People in the 1600s changed their ideas because of what they saw with telescopes.
    C. Galileo Galilei used his invention to show that the Earth revolved around the sun.
    D. Telescopes were an early way for soldiers to spot their enemies from far away.

2. In paragraph 7, the word "unexpected" shows that Galileo was —
    A. excited to share what he saw.
    B. surprised by what he saw.
    C. relaxed by what he saw.
    D. making up what he saw.

3. How do paragraphs 1-2 add to the reader's understanding of the text?
    A. by showing how Galileo got the idea to build a telescope
    B. by describing why Galileo was an important person
    C. by telling about Galileo's childhood experiences
    D. by explaining how early telescopes worked

4. Which line from the text shows that people did not believe Galileo's discoveries?
    A. "The book immediately sold out." (Paragraph 11)
    B. "Sightings like these could change how people thought about the universe." (Paragraph 12)
    C. "Feverishly, Galileo built more telescopes, hoping to make the truth visible to everyone." (Paragraph 13)
    D. Galileo was ordered to stop writing about his observations and was imprisoned in his house." (Paragraph 15)

5. What is the author's point of view about how Galileo should be remembered today?

Discussion Questions

Directions: Brainstorm your answers to the following questions in the space provided. Be prepared to share your original ideas in a class discussion.

1. Many people did not believe Galilelo's observations at the time he discovered them, even though they are commonly accepted now. In the context of this text, why do people resist change? Can you think of any other scientific discoveries that have not been accepted (e.g. climate change, natural selection, the earth being round)? Why were they not accepted and what do people think about them now?

2. The author shares that after seeing the spyglass, Galileo was inspired to build his own. What is an invention or piece of technology that inspires you? How would you like to improve on it to make it even more useful?

3. The author shares that Galileo's observations caused people to start to ask questions. In the context of this text, how do we come to understand the world around us? How is observing the way things work and questioning current ideas an important part of understanding the world?