SCALE – CHANGING VIEWS TIMELINE

Preparation

Download the following:

- Three Close Reads Worksheet
- "Claudius Ptolemy"
- "Galileo Galilei"
- "Nicolaus Copernicus"
- "Isaac Newton"
- "Henrietta Leavitt"
- "Edwin Hubble"

***Note**: You will need to decide whether to complete this activity on paper or online, using an online app like Chronozoom (www.chronozoom.com). If you decide to use paper, try to get a long roll of butcher paper. Although you shouldn't worry too much if students make mistakes, you will want to make the paper run the length of a wall so that it can be added to over the year. If you prefer to work online, Chronozoom and other similar apps are free tools that will allow you to work with the class as a group and save the work online.*

Purpose

This activity asks students to read about different scientists' views of the Universe, and then place those on a timeline to create a story arc that will help them better understand how thinking about the Universe has changed over time. It will also deepen students' understanding of how timelines can be used as analytical tools when studying history.

Process

Students are going to create a timeline that represents how each of these scientists understand the Earth, the Solar System and the Universe.

Tell students that they are going to begin working on a class timeline. They will add important events, people, and ideas to the timeline throughout the rest of the course.

Break the class into three groups and assign each group two scientists:

- **Group A**: Ptolemy and Galileo
- **Group B**: Copernicus and Newton
- **Group C**: Leavitt and Hubble

Each group should do the following:

1. Read the articles about their group's assigned scientists.
2. Create a timeline that includes the following information about each of their assigned scientists:
   - Birth and death dates of the scientists.
   - The major contributions they made (including their theories about our understanding of the Universe, such as a heliocentric view).
   - Who and what influenced their thinking.
3. Create a story arc of how one scientist's thinking progressed to the next.

When students have finished this, have a representative from each group present the story arc to the class. Discuss how creating these timelines influences our understanding of how our views have changed over time. Are there details you don't need? Are there details that should be added?

Ask students to combine the sets of timelines and stories. How does creating these timelines influence our understanding of how our views changed over time? How much detail is the right amount of detail so we can capture the larger narrative? Are there details you don't need? Are there details that should be added?

Finally, invite the groups to refine their timelines and then add them to the class timeline. This might take a little careful supervision at first as students get used to building timelines.

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Directions: After reading the articles about your group's two assigned scientists, use the line below to create a timeline that includes information about each of them. On the back of this sheet, write a story about how one scientist's thinking progressed to the next.

Ptolemy

85 CE to 165 CE

Contributions: Used math to further support geocentrism.

Influences: Aristotle, mathematics, geography, and astrology

Galileo

1564 to 1642

Contributions: Advanced telescope technology.

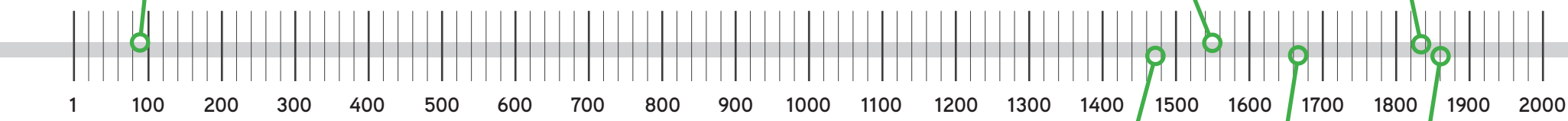
Influences: Copernicus, Kepler, mathematics

Hubble

1819 to 1953

Contributions: Demonstrated that the Universe was much larger than originally thought and that it is expanding.

Influences: Leavitt, Shapley, Slipher, mathematics, astronomy, philosophy



Copernicus

1473 to 1543

Contributions: Synthesized observational data to formulate a heliocentric cosmology, launching modern astronomy.

Influences: Greek and Islamic astronomy, mathematics, law, and medicine

Newton

1643 to 1727

Contributions: Proved "white light" held all the colors. Developed three basic laws of motion and the theory of universal gravity, laying the foundation for our current understanding of physics and the Universe.

Influences: Physics, mathematics, astronomy

Leavitt

1868 to 1921

Contributions: Discovered the relationship between the intrinsic brightness of a variable star and the time it took to vary in brightness, making it possible for others to estimate the distance of those faraway stars, conclude that additional galaxies exist, and begin mapping the Universe.

Influences: Astronomy

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Purpose

In this activity, you'll read about different scientists' views of the Universe, and then place the key information on a timeline. The aim is to get better using timelines as a tool to help you understand changes in thinking over time.

Process

You are going to create a timeline that represents how each of these scientists understand the Earth, the Solar System and the Universe. This is the first time you will work on your class timeline. Over the year, you will add to your timeline as you come across important events, people, and ideas.

Your class will work in three groups.

- **Group A**: Ptolemy and Galileo
- **Group B**: Copernicus and Newton
- **Group C**: Leavitt and Hubble

Working with your group, do the following:

1. Read the articles about your group's assigned scientists.
2. Create a timeline that includes the following information about each of your assigned scientists:
    - Birth and death dates of the scientists.
    - The major contributions they made (including their theories about our understanding of the Universe, such as a heliocentric view).
    - Who and what influenced their thinking.
3. Create a story arc of how one scientist's thinking progressed to the next.

When you've all finished your timelines, a representative from each group will present their story arc to the class. Discuss with the class how these individual timelines combine into a longer-term understanding about our thinking.

How does creating these timelines influence our understanding of how our views changed over time? How much detail is the right amount of detail to allow us to capture the larger narrative? Are there details you don't need? Are there details that should be added?

Now, work with your group to refine your timeline and then add your work to the class timeline.

SCALE – CHANGING VIEWS TIMELINE

Group Name: _____ Date: _____

Directions: After reading the articles about your group's two assigned scientists, use the line below to create a timeline that includes information about each of them. On the back of this sheet, write a story about how one scientist's thinking progressed to the next.