Name_____ Date _____ Per. _____

History of Astronomy Timeline

Purpose: Create a timeline that illustrates major discoveries in astronomy

Time: 2 class periods

Materials: List of astronomical events and dates (included)
Access to internet
Calculator
Adding machine tape
Meter stick

Procedure:
1.   Review the list of astronomy-related events/discoveries on the following pages. You will be choosing 20 to research further and place on a timeline.
2.   Of the ones you will be using, determine the oldest event. Calculate the number of years it occurred before the present. This will help to determine your scaling factor.
3.   Decide how long you want your timeline to be. For example, let's use 2 meters.
4.   Using a meter stick, draw a line down the center of the adding machine tape the entire length of the tape.
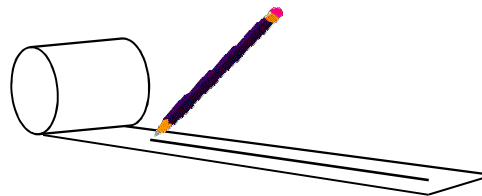
5.   Draw a line perpendicular to the timeline on one end and label it "Present"
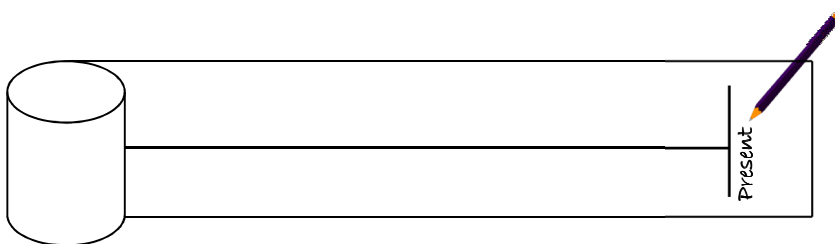
6.   Calculate your scaling factor by dividing the number or years your timeline will cover by the total length of the timeline in centimeters (200 in our example):

For example: If you use Ptolemy's earth-centered theory as your first event (140 AD), that would be approximately 1884 years ago (2014 – 130).

7.   Calculate how many years per centimeter your scale will represent:

$$\text{Scaling factor} = \frac{1884 \text{ years}}{200 \text{ cm}} = 9.42 \text{ years/cm}$$

Your Scaling factor: 1 cm = 9.42 years

8. Measure back from the present: To calculate the distance back from present day, you will divide the number of years ago by 9.42 yrs/cm.

Example: The invention of the telescope was in 1608 … 406 years ago.

Distance back on timeline = 406 ~~years~~ ago × $\dfrac{1\ cm}{9.42\ \text{years}}$ = 43.10 cm

For this example, on your timeline, you would measure 43.10 cm back from present day and label it "1608 -Telescope invented"

9. Now, choose the 20 events you are going to include on your timeline. For each event, calculate its distance (in cm) back from the present. Label it on your timeline. Then, research each event and add details or a brief summary of the event.

Date	Event	Summary/Additional Details
130 BCE	First accurate star map	
140 AD	Ptolemy proposes earth-centered theory of universe	
1054 AD	Supernova observed	
1543 AD	Copernicus publishes heliocentric theory of the universe	
1608	Invention of telescope	
1609	Galileo Galilei makes discoveries with telescope	
1609	First two laws of planetary motion announced.	

1619	Third law of planetary motion announced.	
1656	Saturn's rings discovered	
1668	Invention of first reflecting telescope	
1675	Speed of light measured	
1687	Newton publishes his theory of Universal Gravitation	
1705	Halley predicts return of Halley's Comet in 1758	
1781	Planet Uranus is discovered	
1781	Messier Objects first observed and catalogued	
1842	Doppler Effect discovered	
1846	Planet Neptune discovered	
1905	Special Theory of Relativity published	

1908	Henrietta Leavitt discovers Cepheid variables	
1911-14	H-R Diagram developed	
1916	General theory of relativity introduced	
1929	Discovery that the universe is expanding.	
1930	Pluto discovered	
1931	Cosmic Radio waves discovered	
1957	Sputnik launched	
1958	Explorer I launched	
1961	First man in space	
1962	First American to orbit Earth	
1969	Humans set foot on the moon	

1976	Viking landers explore Mars	
1990	Hubble telescope launched	
1992	COBE launched	
1992	First Exoplanets discovered	
1998	Construction on ISS begins	
2012	First visual proof of black holes	
(Add your own)		

Conclusion Questions:
1. What do you think was the primary reason for the increase in our understanding of the universe?

2. Do you think the major discoveries in astronomy are in the past? Why or why not?

3. Do you think we will ever be done discovering new things in the universe? Why or why not?

4. Predict: How far in the future would you place the following:
    a. Humans set foot on Mars: _____

    b. Life on another planet discovered: _____

    c. Make another prediction about a future discovery or event in astronomy:

Scoring Rubric

Element	4	3	2	1
Scaling Factor	Scaling factor is correctly calculated. Correct units are used. It is applied to the dates correctly. Work is shown.	Scaling factor is correctly calculated. Correct units are used. It is applied to the dates correctly.	Scaling factor is correctly calculated. Correct units are not used or it is applied to the dates incorrectly.	Scaling factor is incorrect. Student does not demonstrate an understanding of calculating or using a scaling factor.
Timeline	Student creates a timeline that accurately depicts at least 20 events/discoveries plus includes three more that were not included in the original list.	Student creates a timeline that accurately depicts at least 20 events/discoveries in the history of astronomy.	Student creates a timeline that depicts fewer than 20 events/discoveries or is not accurate in the placement of at many of the events.	Timeline is attempted but most is missing or incorrect.
Lab Completion	Additional details and/or summaries of the 20 required events/discoveries PLUS 3 more are included. All conclusion questions are answered accurately and thoughtfully. Class-time was used well with student on-task 90+% of the time.	Additional details and/or summaries of the 20 required events/discoveries are included. All conclusion questions are answered accurately and thoughtfully. Class-time was used well with student on-task 90+% of the time.	Additional details and/or summaries of the 20 required events/discoveries are missing. Conclusion questions are answered accurately and thoughtfully. Class-time was used well with student on-task 60+% of the time.	Additional details and/or summaries of the 20 required events/discoveries are missing. Conclusion questions are incomplete. Class-time was not used well with student on-task <50% of the time.