



## Lab Activity: Dimensions of the Solar System

### Fact:

- The solar system includes the sun, the nine planets, and all of the other objects orbiting the sun.

### Investigate:

- You will construct a model to show the relative distance from the sun to the planets.

### Materials:

- adding machine tape
- string
- metric ruler

### Dimensions of the Solar System

Planet	Distance from the Sun	
	Millions of Km	Cm*
Mercury	58	
Venus	108	
Earth	150	3
Mars	228	
Jupiter	778	
Saturn	1427	
Uranus	2870	
Neptune	4486	
Pluto	5900	

\*scale 1 cm = 50 million km

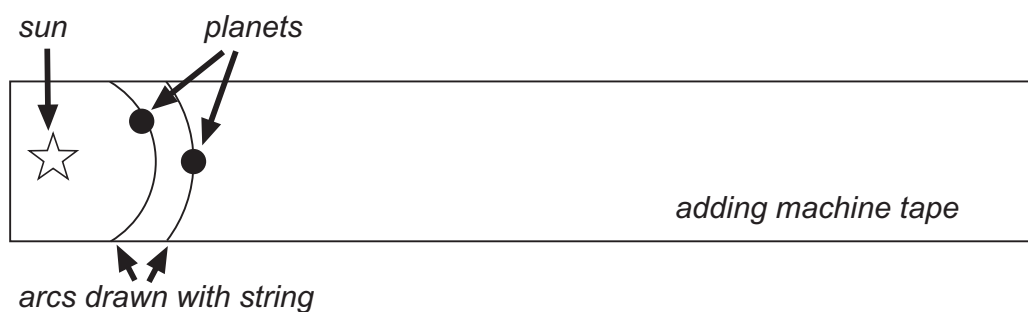


## Procedure

1. Obtain a length of adding machine tape approximately 150 cm long.
2. Using the chart on the previous page, calculate the distance in cm from the sun for each planet using the scale 1 cm = 50 million km.

Example: Earth     $150 \text{ million km} \times \frac{1 \text{ cm}}{50 \text{ million km}} = \frac{150 \text{ cm}}{50} = 3 \text{ cm}$

3. Find the spot one centimeter above one edge of your tape. Draw a small star there to represent the sun. (See diagram below.)
4. To plot each planet, measure the distance from the sun and place a mark at the appropriate distance for each planet.
5. Use the string to draw arcs to represent the orbits of the planets.



6. Label the planets.
7. Draw dotted lines between Mars and Jupiter to represent the asteroid belt.
8. All of the planets through Saturn are easily visible to the naked eye.

Name them. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



9. Each of the planets between Earth and the sun are seen as the *morning star* or the *evening star*. Name them. \_\_\_\_\_

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10. What might be the possible origin of the asteroids? \_\_\_\_\_

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11. Where are the largest planets located? \_\_\_\_\_

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12. Where are the smallest planets located? \_\_\_\_\_

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## Practice

*Answer the following using complete sentences.*

1. What is the name of the most commonly accepted theory on how the universe began? \_\_\_\_\_  
\_\_\_\_\_
2. When do scientists think that the universe was created? \_\_\_\_\_  
\_\_\_\_\_
3. Before the Big Bang, where was most of the matter and energy found in the universe? \_\_\_\_\_  
\_\_\_\_\_
4. How did this big explosion affect the matter and energy that was already present in the universe? \_\_\_\_\_  
\_\_\_\_\_
5. According to the Big Bang theory, how were the galaxies formed? \_\_\_\_\_  
\_\_\_\_\_



6. What continues to happen to the stars in these galaxies today?

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7. What is a slowly rotating cloud of dust and gas called? \_\_\_\_\_

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8. What theory states that the shrinking of a large cloud of dust formed the solar system? \_\_\_\_\_

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9. Describe another theory of how the planets were formed. \_\_\_\_\_

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10. What are the four components that make up the universe? \_\_\_\_\_

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## Practice

*Write a paragraph about the following.*

1. The origin of the universe according to the Big Bang theory: \_\_\_\_\_

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2. The origin of the solar system according to the nebular theory, also known as the Dust Cloud theory: \_\_\_\_\_

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## Practice

Use the list below to complete the following statements.

<b>black hole</b>	<b>red supergiant</b>	<b>white dwarf</b>
<b>neutron star</b>	<b>supernova</b>	<b>yellow dwarf</b>
<b>red giant</b>		

1. Earth's sun is a medium-sized star called a \_\_\_\_\_ .
2. A medium-sized star as it uses its fuel will become a \_\_\_\_\_ then cool and shrink becoming a \_\_\_\_\_ .
3. Stars that are more massive than our sun as they use their fuel will grow into a \_\_\_\_\_ . When the star has no fuel left it will explode as a \_\_\_\_\_ .
4. If the core remains intact after the supernova it is called a \_\_\_\_\_ .
5. If the core was very massive it might form a \_\_\_\_\_ .



## Practice

Label each **heavenly body** illustrated below and give one characteristic.

### SUN

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_

8. \_\_\_\_\_

9. \_\_\_\_\_

10. \_\_\_\_\_





## Practice

*Circle the letter of the correct answer.*

1. A \_\_\_\_\_ is a mass of dust and ice with a bright gaseous tail that orbits the sun.
  - a. planet
  - b. meteor
  - c. star
  - d. comet
  
2. \_\_\_\_\_ are bodies that revolve around a sun and reflect its light.
  - a. Galaxies
  - b. Stars
  - c. Meteors
  - d. Planets
  
3. \_\_\_\_\_ are hot, bright bodies of gas constantly exploding in space.
  - a. Meteors
  - b. Elliptical galaxies
  - c. Galaxies
  - d. Stars
  
4. \_\_\_\_\_ are fragments of rocky material from space that enter Earth's atmosphere and burn as they fall.
  - a. Spiral galaxies
  - b. Meteors
  - c. Elliptical galaxies
  - d. Galaxies
  
5. A \_\_\_\_\_ is millions or billions of stars in a system.
  - a. constellation
  - b. galaxy
  - c. meteor
  - d. planet



6. \_\_\_\_\_ galaxies are oval-shaped galaxies which are smooth in appearance and have few clouds of dust and gas.
- Constellation
  - Spiral
  - Elliptical
  - Comet
7. \_\_\_\_\_ galaxies are galaxies that are disk-shaped.
- Spiral
  - Star
  - Nebula
  - Elliptical
8. A \_\_\_\_\_ is a small number of stars that appears to form a shape or image.
- comet
  - constellation
  - galaxy
  - meteor
9. A principle based on facts which has withstood the test of time is a \_\_\_\_\_.
- satellite
  - planet
  - solar system
  - theory
10. All bodies in space and all space between these bodies, and all energy and all matter, compose the \_\_\_\_\_.
- elliptical galaxy
  - solar system
  - spiral galaxy
  - universe



11. The sun and all the planets, their moons, asteroids, meteors, and comets and all objects that move around the sun compose the \_\_\_\_\_.
- solar system
  - elliptical galaxy
  - universe
  - spiral galaxy
12. A \_\_\_\_\_ is a cloud of interstellar gas and/or dust.
- satellite
  - nebula
  - planet
  - solar system
13. \_\_\_\_\_ are fragments of rock and metal that orbit the sun, many of which are located between Mars and Jupiter.
- Galaxies
  - Satellites
  - Meteors
  - Asteroids
14. A \_\_\_\_\_ is an object that revolves around a larger object.
- satellite
  - galaxy
  - constellation
  - comet
15. The moon and planets revolve or \_\_\_\_\_ around the sun.
- asteroid
  - comet
  - solar system
  - orbit



