Name _____ Activity Sheet 1, Part A

Meet Our Solar System

1. What is a solar system?

A solar system consists of a star and all the objects that orbit it.

2. What is the name of the star in our Solar System? Sun

3. What are the parts of our Solar System?

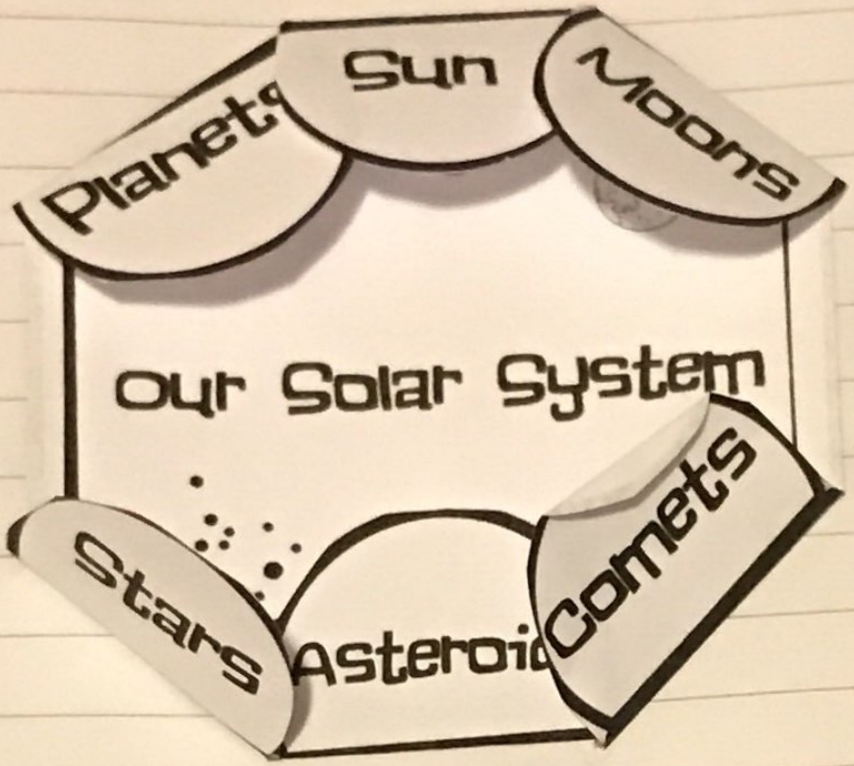
the planets, Sun

4. How many planets are there in our Solar System? 8

5. What are the names of the planets in our Solar System, in order beginning with the planet closest to the Sun?

Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune

Our Solar System



Meet O… system

Nachos!

Us

Served

Just

Mother

Eager

Earth

Very

Venus

My

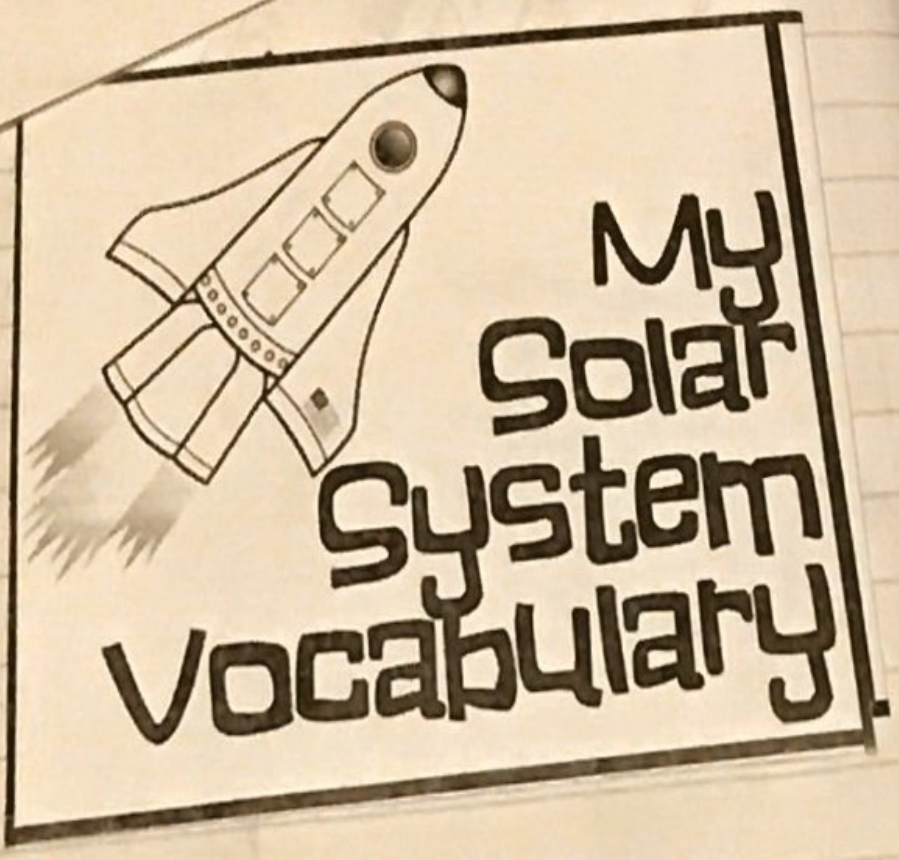
Sun

A solar system is a star and all of the objects that travel around it.

time it takes for a planet to complete one revolution around the sun

meteor

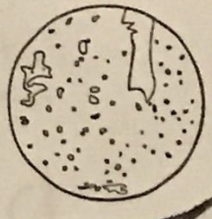
bowl-shaped depression formed when a space object hits a planet



Name	Diameter (km)	Atmosphere	Average Distance from Sun (km)	Moons and Rings
Sun	1,392,000	hydrogen	–	–
Mercury	4,878	helium/ hydrogen	57.9 million	none
Venus	12,104	carbon dioxide/ nitrogen	108.2 million	none
Earth	12,756	nitrogen/ oxygen	149.6 million	1 moon
Mars	6,794	carbon dioxide	227.9 million	2 moons
Jupiter	142,984	hydrogen/ helium	778.4 million	63 moons, 1 ring
Saturn	120,536	hydrogen/ helium	1.427 billion	56 moons, 7 ring groups
Uranus	51,118	hydrogen/ helium	2.871 billion	27 moons, 11 rings
Neptune	49,528	hydrogen/ helium	4.498 billion	13 moons, 4 rings

- small
- rocky
- craters
- have a few moons

The Inner Planets

Mercury 

with lava
Venus 

Earth 

Mars 

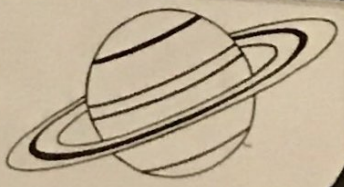
Earth

The Outer Planets {Gas Giants}

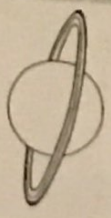
- [illegible] covered in [illegible]
- has a giant storm 2x the size of Earth
- ~~fastest~~ turning planet
- NO DANCING!

Jupiter

Saturn



Uranus

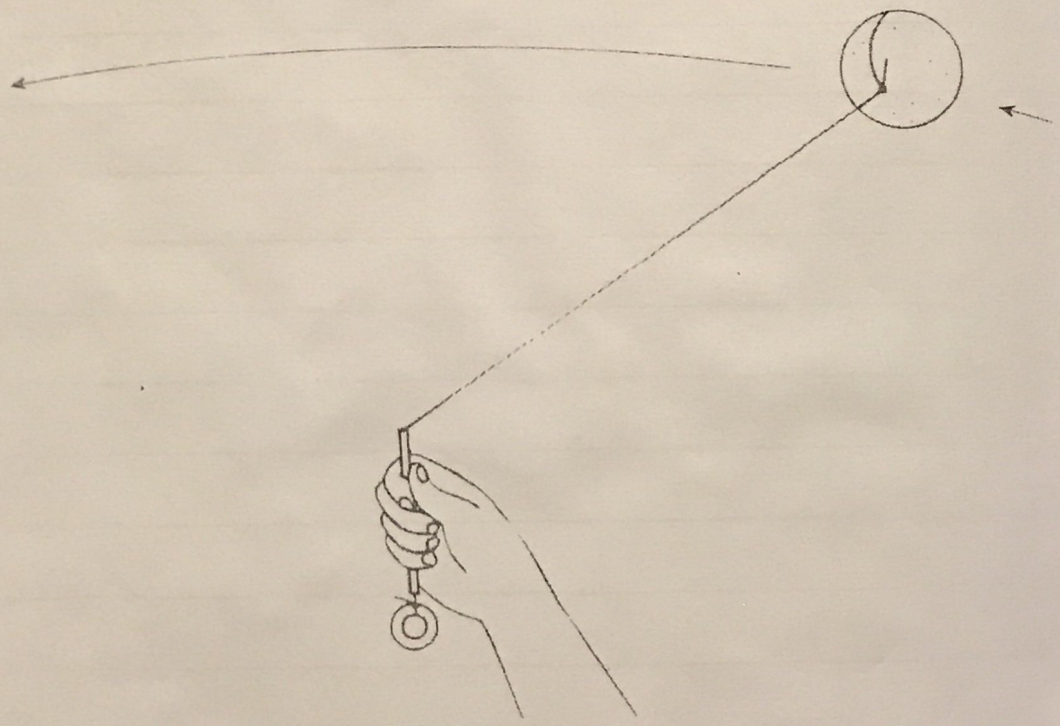


Neptune

(36)

satellite Model

1. Make a satellite system model like the one shown below.
   - Tie one end of the fishing line to the washer.
   - Thread the other end of the line through the tube and the through the hole in the ball. Tie this end around the ball.
   - Hold the washer next to the bottom of the tube. Raise you fist above your head and begin rotating your fist so that t ball circles your fist.



2. What is the satellite in this model? ball

3. What is the satellite orbiting? straw + hand

4. Imagine that this is a model of our Solar System.
   a. What object is represented by your fist? Sun
   b. What object is represented by the ball? planet

perihelion
close to Sun

Sun

ellipse
(stretched out circle)

C
focus

foci

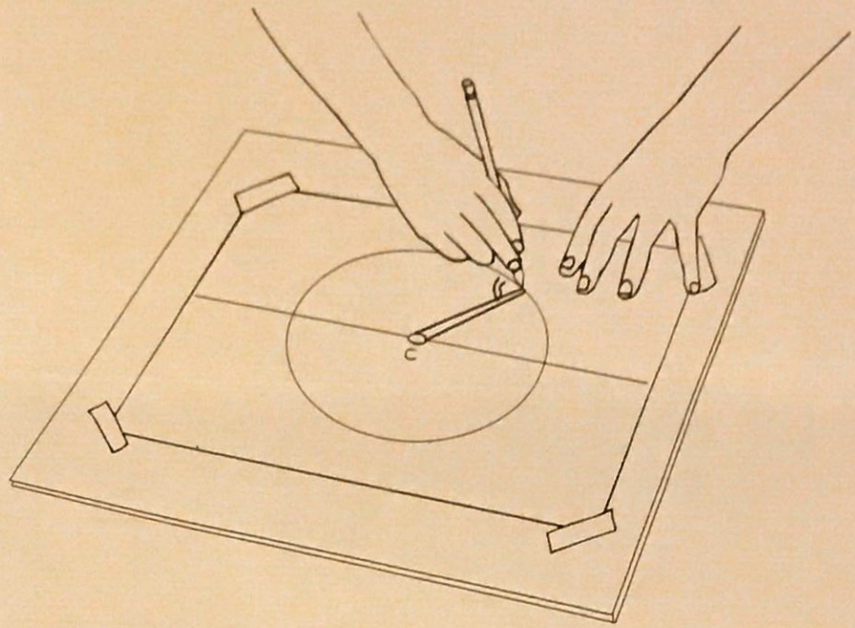
aphelion
far from Sun

Name _____

Activity Sheet 3

Planetary Orbits Are Not Circles

1. Use your pencil and ruler to measure and draw a line across the center of the paper. Make a dot at the mid-point of the line. Label this dot *C*. Put a push pin in dot *C* and then put the string loop around the push pin. Put your pencil in the string loop and gently pull. Draw a circle as shown in the picture below.

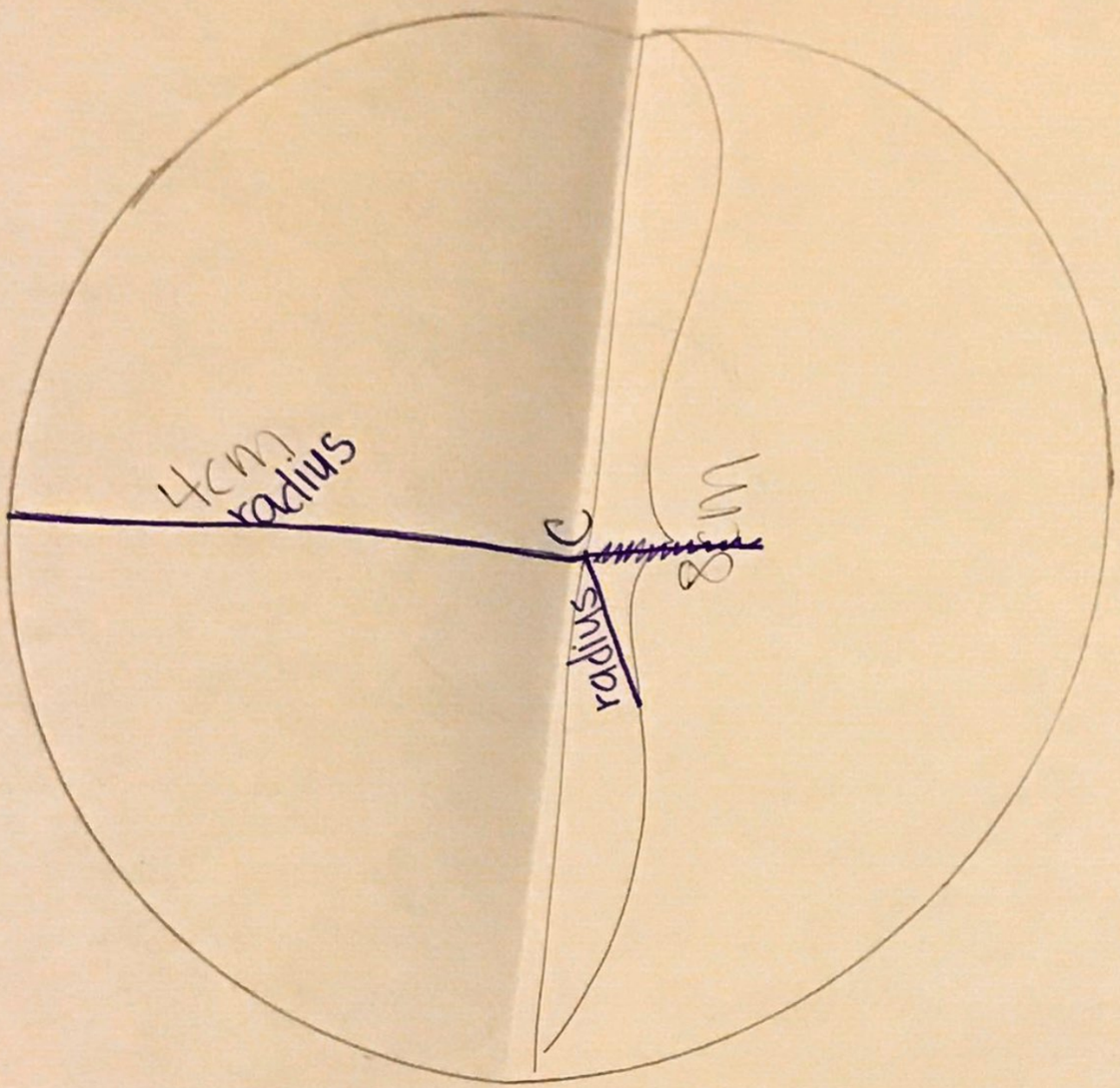


2. Measure and put two more dots on the line, each 4 cm (about 1.6 in.) from *C*. Label one *S* and the other *X*. Move the push pin from *C* to *X*. Place another push pin in *S*. Put the string loop around and under both push pins. Put your pencil inside the loop. Draw an ellipse with the setup.

   a. What is the term for the point in a planet's orbit when the planet is farthest from the Sun? aphelion

   b. What is the term for the point in a planet's orbit when the planet is closest to the Sun? perihelion

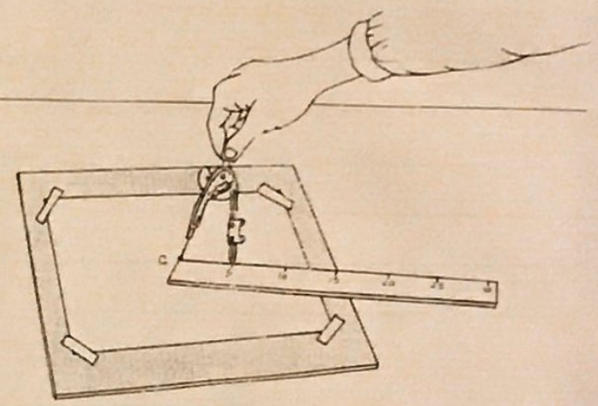
   c. What is the term for the shape of a planet's orbit? ellipse



Name _____ Activity Sheet 4

Making Circles

1. What is the radius of the circle drawn in Activity 3? 4cm
2. What is the diameter of that same circle? 8 cm
3. Tape a sheet of paper to the cardboard. Draw a dot near the center of the paper. Label the dot *C*. Put the point of the compass into the dot labeled *C*, as shown in the picture below.



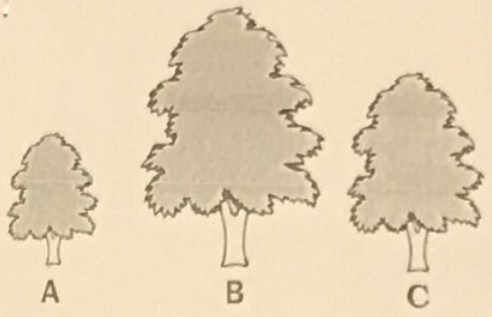
4. Use the compass to draw a circle that has a radius of 5 cm. Use your ruler to measure. What is the diameter of this circle? 10cm
5. Make two circles—one with a radius of 3 cm and the other with a radius of 10 cm.
   a. What is the diameter of the circle with a 3-cm radius? 6cm
   b. What is the diameter of the circle with a 10-cm radius? 20cm
6. Label the radius of each circle with the word *radius*.
7. Do you see a relationship between the lengths of a radius and a diameter in each circle? Explain.

The diameter is double the radius.

Name _____

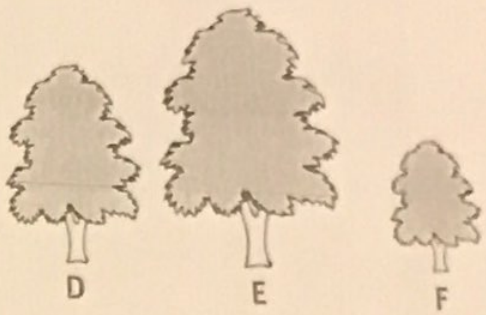
Activity Sheet 5

Scale and Relative Size



1 cm : 5 m

2



1 cm : 10 m

1. Measure the height of each drawing of a tree. Record your measurement of the drawing in the chart below. Then calculate the heights of the actual trees.

	Tree A	Tree B	Tree C	Tree D	Tree E	Tree F
Drawing Height (cm)	2	4	3	3	4	2
Actual Height (m)	10	20	15	30	40	20

2. What is the scale used to draw Trees A, B, and C? 1cm : 5m
3. What is the scale used to draw Trees D, E, and F? 1cm : 10
4. Is the drawing of Tree A the same height as the drawing of Tree F? yes
5. Is the actual height of Tree A the same as the actual height of Tree F? Why or why not? NO because they have a different scale.
6. If the drawings are the same heights, but the scales to which they were drawn are different, are the actual heights of the trees the same or different? different
7. How could you tell which actual tree is taller if you have two drawings that are the same heights but have been drawn to different scales? (Hint: Compare the scale ratios.)

The taller tree has a larger ratio or scale.

Scale Drawings

Modeling Planet Sizes

1. How can you make models of the planets that allow you to compare their relative sizes?

You have to use the same ratio or scale for all of the planets.

Name	Actual Diameter (km)	Scale Model 1 cm:5000 km	
		Diameter (cm)	Radius (cm)
Sun	1,392,000	278.4	139.2
Mercury	4,878	1.0	0.5
Venus	12,104	2.4	1.2
Earth	12,756	2.6	1.3
Mars	6,794	1.4	0.7
Jupiter	142,984	28.6	14.3
Saturn	120,536	24.1	12
Uranus	51,118	10.2	5.1
Neptune	49,528	9.9	4.9

2. Calculate each scale model radius from the scale model diameters given above. Round to the nearest tenth of a centimeter. Record the radius in the Scale Model Radius column.

3. Use the Scale Model Radius measurements to measure, draw, and cut out circles. The circles representing Mercury and Mars will be too small to measure with the drawing compass. Use the ruler to measure these objects and draw the circles by hand.

Scale models help us understand the solar system because they show relative size and distance.

(42)

Scale and Relative Distance

1. Measure from the book (on the floor by the board) to your desk, from the book to the teacher's desk, and from the book to the wall opposite the board.

   What are the actual distances?

book to your desk	book to teacher's desk	book to wall
6 yd.	2 yd.	9 yd.

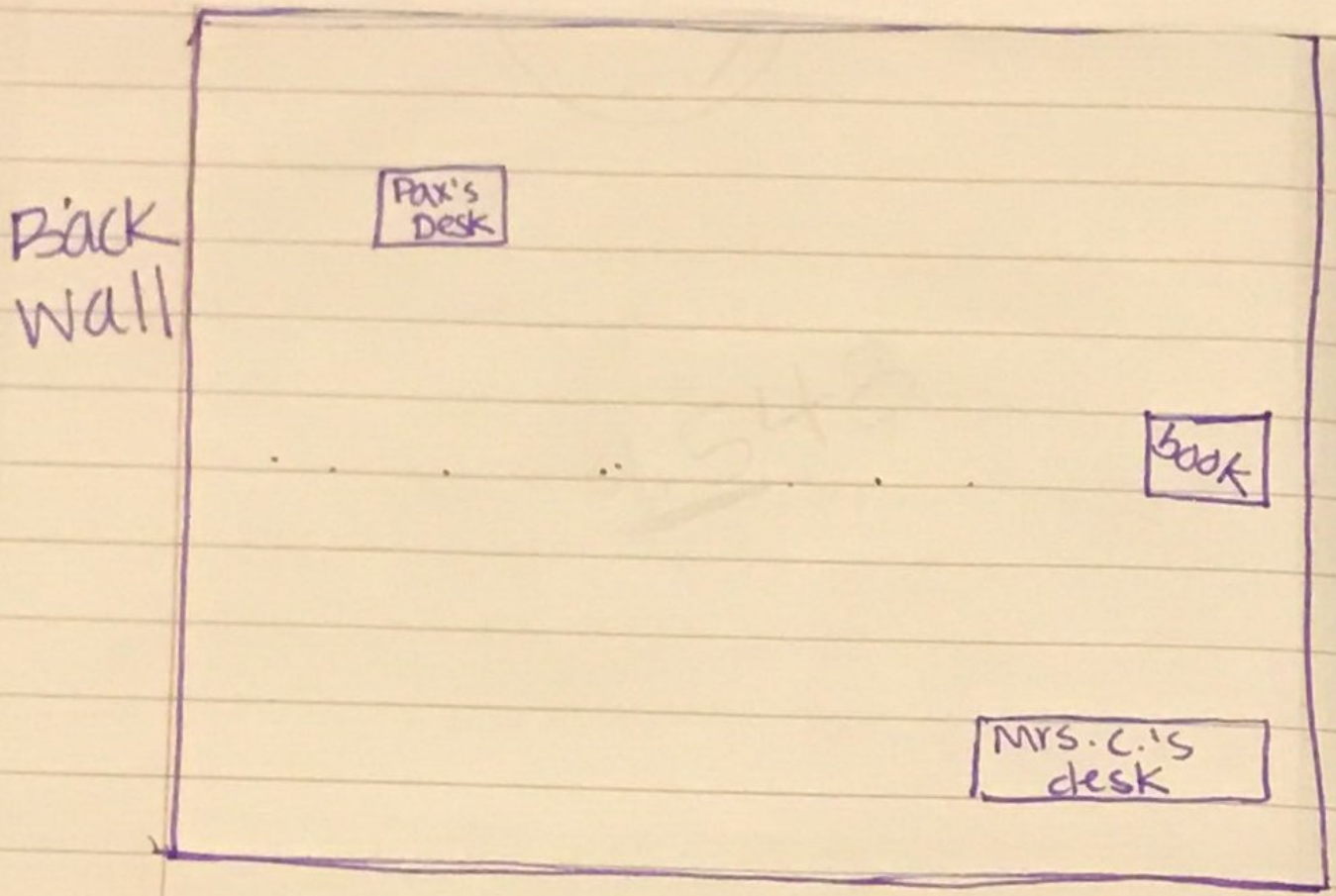
2. Decide on a scale that will enable you to reduce the distances so that you can draw the relative distances in the space below. (Hint: First take the longest distance and scale it down to fit.)

   a. What scale did you use? _____

   b. What are the scaled distances?

book to your desk	book to teacher's desk	book to wall

3. Make your scale drawing below. Measure and mark off in centimeters the scaled distances to each object. Make an X to represent each object and label the Xs.



Name	Distance from Sun	
	Average Actual Distance (km)	Scale Model 1 cm : 9,000,000 km
Mercury	57,900,000	6.4cm
Venus	108,200,000	12cm
Earth	149,600,000	16.6cm
Mars	227,900,000	25.3cm
Jupiter	778,400,000	86.5cm
Saturn	1,427,000,000	158.6cm
Uranus	2,871,000,000	319cm
Neptune	4,498,000,000	499.8cm

1. Which two planets have their orbits between Earth and the Sun? Mercury + Venus

2. Which planet orbits at the greatest distance from the Sun? Neptune

Name _____

Activity Sheet 9

Days and Years

1. Complete these sentences:
   a. A day is the time it takes a planet to complete one rotation about its axis.
   b. A year is the time it takes a planet to complete one revolution around the Sun.

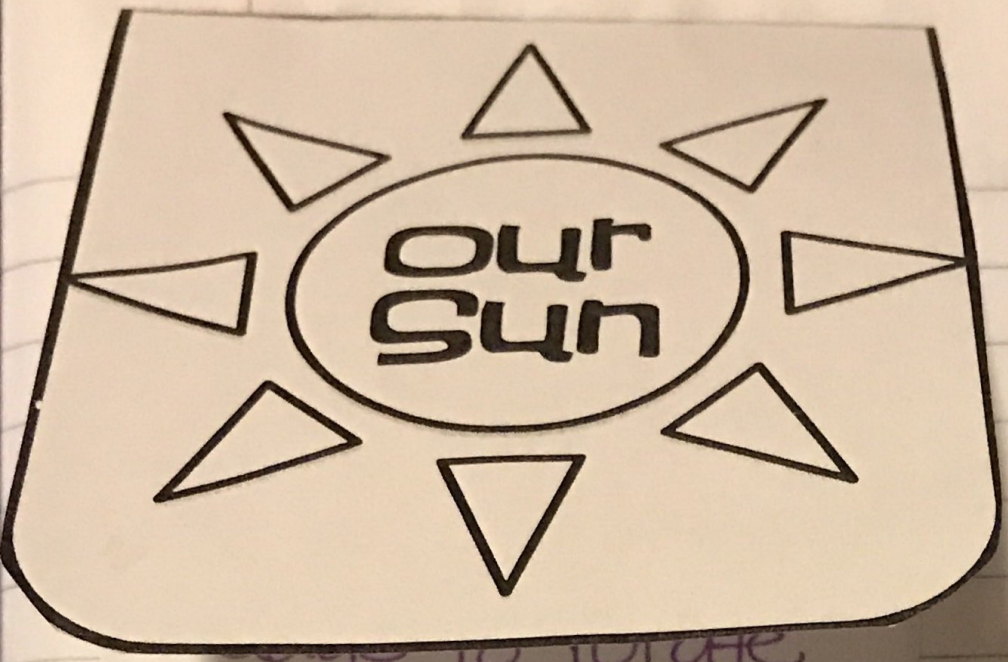
2. Take apart the satellite model. Put the plastic tube into the hole in the foam ball so that the ends of the tube stick out on both sides of the ball. This is your Earth model. Use one end of the tube as a handle and spin the ball as you would you spin a top.
   As you spin the model, are you simulating days or years? days

3. Go to one of the light sources. Hold the Earth model by the tube and near the light. Rotate the ball once.
   a. What do you notice about how much of the model is lit and how much is dark?
   Half at a time
   b. Do the sizes of the light and dark areas change when you rotate the Earth model? NO
   c. What do the light and dark areas represent on Earth?
   Day + Night

4. Continue to hold the model by the tube, but now move the ball around the light source. What are you simulating now, a day or a year? year

5. Make one revolution with your model close to the light source. Now, move the model farther away from the light source and make another revolution, moving the model at the same speed.
   a. Which revolution took longer? the one that's farther
   b. If planets have orbits of different sizes, will all planets make one revolution in the same length of time? NO
   c. Does a planet with a very large orbit take more time or less time to make one revolution around the Sun?
   More

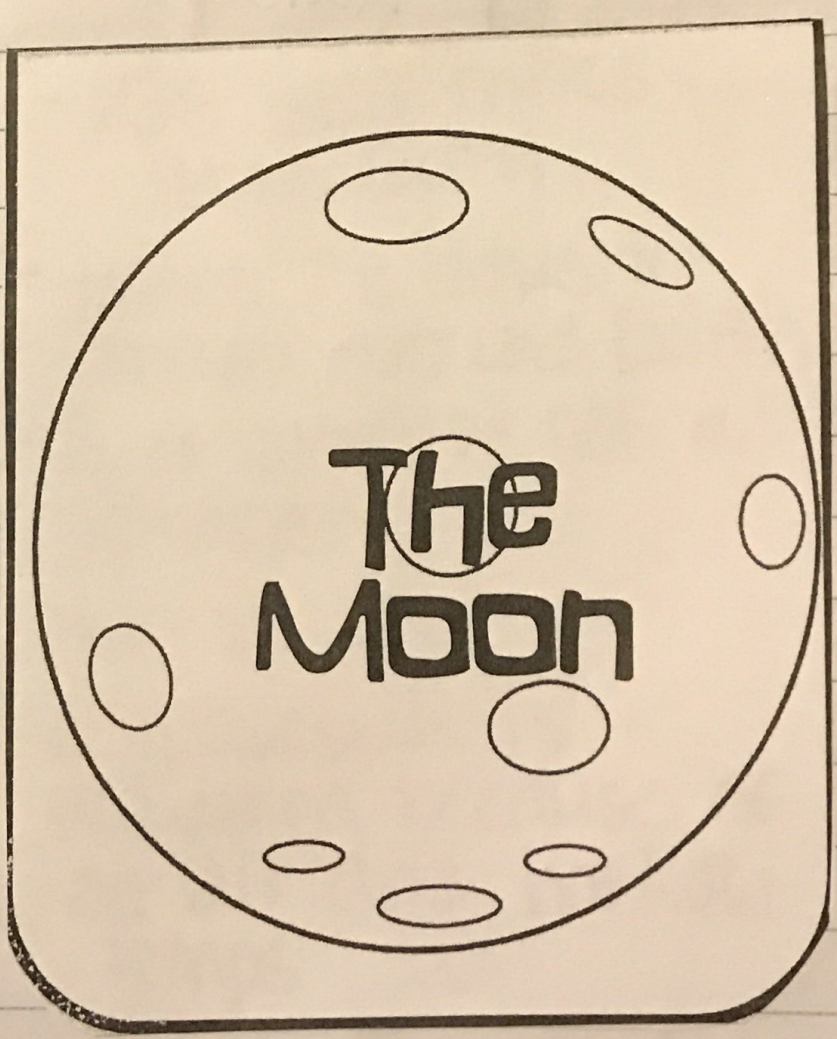
Days and Years

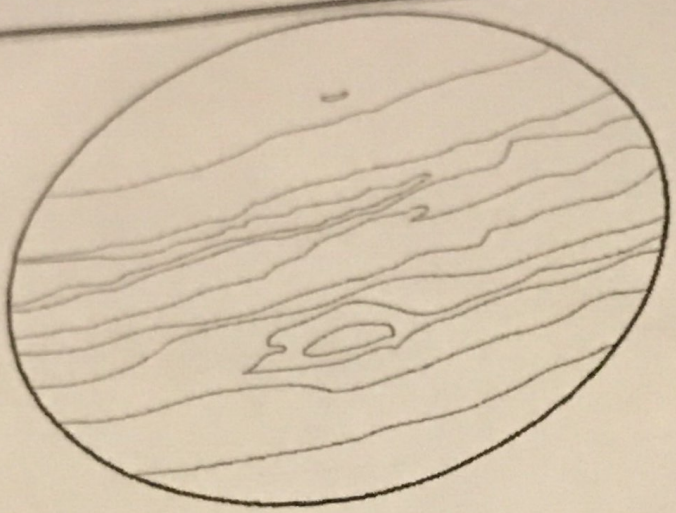


- is a star

Moon phases =

amount of lighted surface we can see





Pluto

- Dwarf Planet

Rotation vs. Revolution