Activity: Orbits



Pre-Lab:

Define the following terms.

- 1. Orbit: ______
- 2. Orbital Period: _____
- 3. Retrograde: _____

Demo Q's:

Watch the teacher's demonstration and answer the following questions.

1. What happened to the speed of the string & washer when the length of the string decreased?

2. How did what you see with the string and washer compare with what occurs with the planets orbiting the Sun?

Graphing:

Using the table of values below, make two graphs:

• Graph #1 = Orbital Period (X-Axis) vs. Distance from the Sun (Orbital Distance) (Y-Axis)

	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune
Mass	0.3302	4.869	5.975	0.6419	1,898.6	568.46	86.83	102.43
(10 ²⁴ kg)								
Eq. Radius	2439	6052	6378	3393	71,492	60,268	25,559	24,766
(km)								
Orbital	57.9	108.2	149.6	227.9	778.3	1427.0	2869.6	4496.6
Distance								
(10 ⁶ km)								
Orbital	87.969	224.7	365.25	686.98	4330.6	10,747	30,588	59,800
Period								
(days)								
Rotational	1407.6	5832.5	23.934	24.62	9.92	10.5	17.24	16.11
Period		(ret.)					(ret.)	
(hours)								

Analysis Questions:

Once you have completed your graphs, use the graphs to answer the following questions:

a. Is the orbit of a planet around the Sun a perfect circle?
b. If not, explain the possible shape of an orbit.

- 2. The orbital period of Earth is 365 days. What does this time frame represent?
- 3. How long is a year on Venus?
- 4. How old are you in Mars years?
- 5. How many Earth years go by before one Jupiter year has passed?
- 6. a. What trends do you see looking at your Graph: Orbital Period vs. Distance from the Sun?
- b. Why do you think this is?
 - 7. How long does it take for the Earth to rotate once?

8. a. How long is a day on Jupiter?b. How long is a day on Venus?

9. a. What planet rotates the fastest? ______b. What planet rotates the slowest? ______

10.Do you see any relationship between distance from the Sun and rotational period?

11. Which planets have retrograde rotation (spin backwards)?

- 12. When a planet is closer to the Sun, does it move faster or slower in its orbits?
- 13.Looking at this image, $\rightarrow \rightarrow \rightarrow$

Explain what the terms apogee and perigee mean.

