

My Solar System

Name: _____ Date: _____

at phet.colorado.edu/en/simulations/my-solar-system

For our mission, we will need to know what the following words mean.

<u>Ellipse</u>	
Period of Revolution	

Select the [My Solar System](http://phet.colorado.edu/en/simulations/my-solar-system) simulator at phet.colorado.edu/en/simulations/my-solar-system

1. Click the **Play button** and take 5 minutes to explore and experiment with the different controls.

- What does the **System Centered** check box do? (Hint: try with **Preset: Trojan Asteroids**)

- What does the **Show Traces** check box do?

Make sure **Path** and **System Centered** are checked for all the questions below.

To slow the animation put the Accurate - Fast slider next to Accurate.

2. Choose **Sun and Planet** from the **Preset** menu.

Describe the motion and what you think causes it below. Use the **Play** and **Rewind to Beginning** buttons to measure the **Period of Revolution** for each object.

Object	Describe the motion	What causes it to move that way?	Period of Revolution
Planet	<i>Planet moves in a circle around the sun</i>	<i>The Sun has a gravitational pull on the planet.</i>	
Sun			

3. **Reset** the simulation. In the **Settings**, **Double** the mass of the sun (body 1) to **400**.

What is the Planet's new *Period of Revolution*?

How does **doubling** the **mass** of the **sun** change the shape of the orbit of the planet?

When does the planet go the fastest in its orbit? When does it go the slowest?

4. **State** Kepler's 3 Laws of Planetary Motion. [5.5 Kepler's Laws of Planetary Motion - ck12.org](https://www.ck12.org/section/5.5-Kepler's-Laws-of-Planetary-Motion/)

Kepler's First Law	
Kepler's Second Law	
Kepler's Third Law	

5. **Choose** Ellipses from the **Preset** menu. **Start** and **Stop** the simulation to fill in the table below.

<i>Planet</i>	<i>Period of Revolution (planetary year)</i>	<i>Describe the motion of each planet (shape of orbit, speed changes, and patterns)</i>
Purple Planet (body 2)		
Blue Planet (body 3)		
Green Planet (body 4)		

6. **Play** all the other **Presets**. **Describe** and **draw** the motion of your favorite.

Describe or draw the motion of each object (shape of orbit, speed changes, patterns)

Why is this your favorite?