STEM Sims™

Solar System

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Do you need an idea for a scientific study?
Try out one of our ideas or make one of your own.

It's home to Earth and several other fellow planets. It's our Solar System. Take the following brief quiz to see how much you already know about our Solar System. See the bottom of page 4 to check your answers.

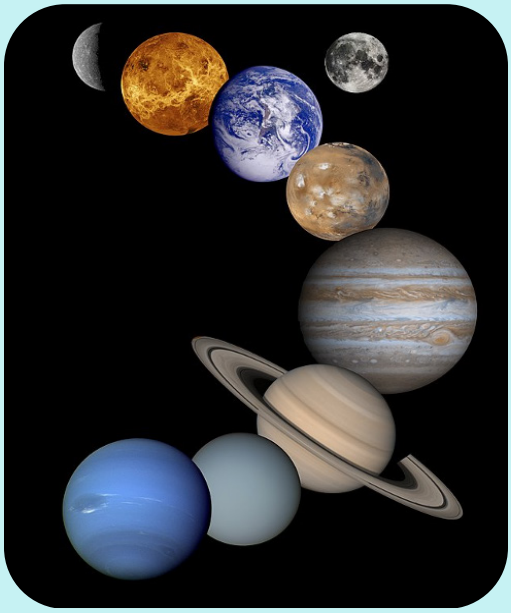
1. Which planet experiences the largest temperature variations between day and night?
   a. Mercury
   b. Venus
   c. Earth
   d. Mars

2. Olympus Mons, the largest volcano in the Solar System, is located on which planet?
   a. Earth
   b. Mars
   c. Venus
   d. Mercury

3. Which planet has the strongest winds in the Solar System, reaching speeds of up to 2,000 kilometers per hour?
   a. Jupiter
   b. Saturn
   c. Uranus
   d. Neptune

4. Which moon in our Solar System is the only one known to have a dense atmosphere?
   a. Titan (Saturn's moon)
   b. Europa (Jupiter's moon)
   c. Ganymede (Jupiter's moon)
   d. Triton (Neptune's moon)

5. Which planet in our Solar System has the most moons?
   a. Jupiter
   b. Saturn
   c. Uranus
   d. Neptune



Simulating Planetary Orbits

Ever wondered why some planets zip around the Sun while others take their sweet time? In this lab, you'll see how a planet's distance affects its orbital speed. Get ready to spin, observe, and discover the fascinating connection between gravity and planetary motion!

Materials Required

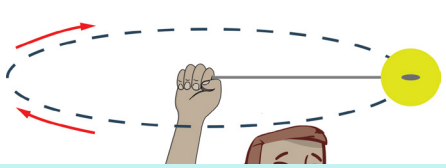
String or yarn about 6 feet long	Tape
Tennis ball to represent a planet	Tape Measure

Safety First!

- Make sure to have adult permission before completing this activity.
- Complete this activity in an open area.
- Make sure to NOT hit anyone or anything with the twirling tennis ball.

Procedure

1. Use the tape to securely attach the tennis ball to one end of the string.
2. Hold the string about halfway (3 feet) between the tennis ball and open end of the string.
3. In an open area, slowly twirl the ball above your head in a horizontal motion as shown in Figure 1 below.



4. In Table 1, describe the force the tennis ball exerts on your hand as you twirled the ball slowly.

Table 1. String Force

String Distance	Twirling Speed	Feel of Force on Hand
3 feet	slow	
3 feet	fast	
6 feet	slow	
6 feet	fast	

5. Again, holding the string at the 3-foot mark, this time twirl the tennis ball quickly over your head. Record in Table 1 the feel of the force on your hand.
6. Hold the string at the opposite end of the tennis ball (6-foot mark) and repeat steps 3 -5. Make sure to record your data in Table 1.

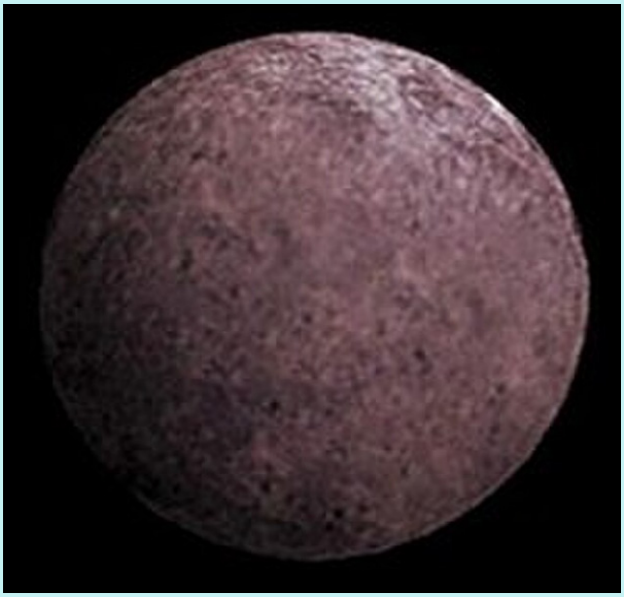
Questions

1. Describe the relationship between the speed of the orbiting tennis ball and the amount of force felt on your hand.

2. Describe how changing the length of the string affected the results of your experiment.

Solar System

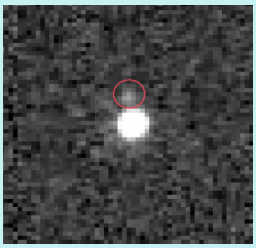
Out There Lurking



Imagine a dwarf planet so far out in our Solar System that it takes over 1,000 years to orbit the Sun! That's **Gonggong**, a reddish world discovered in 2007, lurking beyond Pluto in the icy depths of the Kuiper Belt.

What's really cool about Gonggong is its moon, **Xiangliu**. This little moon (red circle in the image below), discovered in 2016, is acting strangely. Instead of orbiting Gonggong in the same direction that Gonggong spins, it's going the opposite way! This "retrograde orbit" has astronomers puzzled.

One theory is that Xiangliu wasn't formed with Gonggong. Instead, it might have been a wandering object captured by Gonggong's gravity long ago. Imagine a cosmic game of tag, where Gonggong snagged Xiangliu as it flew by!



Studying Gonggong and its rebellious moon helps us understand how our Solar System formed and evolved. It's a reminder that there are still many mysteries hidden in the vastness of space, just waiting to be uncovered. Who knows what other strange and wonderful objects are out there, waiting for us to find them?

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Answers: Page 2 Answers: 1) a, 2) b, 3) d, 4) a, 5) a. **Page 3 Answers: Simulating Planetary Orbits** 1) Answers will vary. 2) Answers will vary.