Student Sheet

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period\_\_\_\_\_

**Title: Forces of the Solar System**

**Introduction:** There are two main forces acting on our solar system that help determine its structure. The first is called inertia. You may have experienced this force when you have gone around a corner in a car or on an amusement park ride. Your body wanted to continue in the direction it was going, but the side of the car or the seatbelt made you change your direction, probably pretty forcefully. **Inertia is when an object in motion tends to stay in motion in the same direction and speed it was headed, unless acted upon by an outside force.** In your case, your body wanted to continue in a straight line, but the car (an outside force) made it curve. Just like with your body, the planets want to travel in a straight line. However, the sun’s gravity pulls the planets into orbit. Therefore, the second force is gravity. **Gravity is the force of attraction between all objects in the universe**. The strength of the attraction depends on the mass of the objects and the distance between them. Gravitational attraction opposes inertia and keeps planets from traveling through space in a straight line.

**Procedures:**

1. As a class we will head outside. Be sure to bring your paper, something to write with, and something to write on.
2. As the volunteers carry out the demonstrations, draw your pictures in the data area below.

**Data:**

Balloon Set 1:

Small Medium Large

Balloon Set 2:

Small Medium Large

Balloon Set 3:

Small Medium Large

**Hypothesis:** What direction do you think the balloons would travel in if they were released while spinning? (circle, diagonal, straight line, etc.) Remember to write your hypothesis in an “if and then” statement.

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Below draw the direction the balloons actually traveled when released. Just draw one picture to represent all three balloons.

**Analysis:**

1. What are the two forces that hold our solar system together?
2. What is gravity?
3. What object in our solar system has the largest amount of gravity? Why?
4. Why did the balloons with more water, elongate more than the others?
5. In your opinion, why do you think the planets are not perfectly round, but bulge near the equators?
6. In the diagram below, label which part of the demonstration represented the sun, the sun’s gravity, and the planet. Also draw which direction the balloon would travel if the person were to let go.

**Conclusion:** Write out two science related things you learned during this lab.

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