Name_____

GRAVITY

Directions: Read the information below.

Gravity in the Solar System

When you drop something on your foot, it hurts. That's because of gravity. Without gravity, objects would float in the air instead of falling to the ground. Imagine what our world would be like without gravity. Would rain still fall downward to the ground? Would airplanes be able to land as safely? Earth is not the only place that experiences gravity. It's also in our solar system. In fact, gravity is what keeps the planets in place throughout our galaxy.

As you may know, Earth rotates around the sun, making one full rotation every year. The earth is able to stay in place because of gravity. Just like how gravity pulls objects to the ground when they are dropped, the sun pulls the earth toward it, keeping it from a free fall into space. Large objects have a stronger gravitational pull on smaller objects. Our sun is much larger than Earth, thus having a stronger gravitational pull on Earth, not the other way around, keeping us near the sun.

You might be asking yourself, if the sun is pulling on the earth, won't we get sucked up into the sun? The answer is no. Recall we mentioned earlier that Earth rotates around the sun. This circular motion prevents us from going into the sun, keeping us around it. Consider a hula hoop. Trying to keep a hula hoop up around your body may be difficult, but the hula hoop will never cave completely into your body, it will continually rotate around because of the circular motion. Unlike the sun and Earth, your body does not have a larger gravitational pull on the hula hoop to keep it up off the ground. Ultimately, in this example, the hula hoop falls because the gravitational pull on earth is too heavy causing the hoop to eventually fall. Luckily, this would never happen in our solar system. Rest assured, Earth sits securely in place along its rotational path around the sun.

Directions: Complete the activity below.

Gravity in the Solar System

1. Gather a rubber band and two marbles. One marble will represent the sun and the other will represent the earth.
2. Hold each marble in one hand between your thumb and index finger, with the rubber band wrapped around them both.
3. Holding the "sun" marble still, rotate the "earth" marble around. Notice how you cannot pull the "earth" marble completely away from the sun . (Be careful — the rubber band may break if pulled too hard!)

Directions: Answer the questions below.

1. Describe what happened when you tried to move the marbles apart.
2. What stopped them from moving farther away from each other? Compare this to what happens in our solar system. How is it similar?
3. Imagine a friend told you he was worried the earth would fall away from the sun and free fall into space. Name two reasons you could give him to explain why this could not happen.