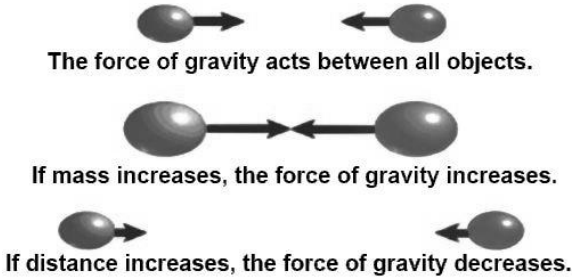
Name: _____ **Gravity**

What is Gravity?

Gravity is an invisible force that pulls objects toward each other. The pulling force of gravity works across space. This means objects do not have to touch each other for the force of gravity to affect them; they can pull on each other from a distance. For example, the Sun is millions of miles from Earth, but its gravitational pull is what holds the Earth (and the other planets in our solar system) in orbit around it. [The Earth would travel in a straight line if the Sun were not pulling on it. At the same time, Earth's orbital speed (66,000 miles/hr.) keeps it from falling into the Sun.]

The force of gravity also keeps the moon in orbit around Earth. And the gravitational pull of the moon pulls the seas towards it, causing the ocean tides. Gravity creates stars and planets by pulling together the material from which they are made.

All objects in the universe are attracted to (pulled toward) all other objects, but the amount of force pulling any two objects toward each other depends upon how massive the objects are (how much matter they contain). The more massive the objects are, the greater the attractive force between them.



You are attracted (pulled toward) the Earth because of its great mass. This attraction between you and the Earth is what holds you to the Earth's surface and pulls you back down again when you jump up. It's what gives you weight. If you were on a planet less massive than Earth, you would weigh less than you do here.

But, while the earth is pulling on you, you are pulling back. You exert the same gravitational force on Earth that it does on you. But because Earth is so massive, it is much harder to move than you are. So, though even though you're pulling Earth with just as much force as it's pulling you, the planet is hardly affected at all.

Gravity not only pulls on mass; it also affects light. Even light can be pulled into a black hole. Black holes pack so much mass into such a small volume that their gravity is strong enough to keep anything, including light, from escaping.

The gravitational force between two objects depends not only on their masses, but also on the distance separating them. The farther apart they are, the weaker the force will be. This is why we aren't pulled off the earth by the much more massive Sun. The Sun is just too far away.

Gravity: https://www.pbs.org/video/gravity-m3swlv/

Black Holes: https://www.youtube.com/watch?v=OfMExgr_vzY