**Gravity**

The force that makes everything fall to Earth is called **gravity**. It is a mysterious force that has been studied by scientists since **Isaac Newton** was the first person to mathematically describe it. His theory is called Newton's Law of Universal Gravitation. Years later, Albert Einstein's Theory of Relativity made improvements to Newton's original theory. Of course, it can be said the person who dropped something may have discovered gravity but it can now be scientifically explained.

It was in 1687 that Newton published the Philosophiae Naturalis Principia Mathematica (which means 'Mathematical principals of Natural Philosophy'). It was his most important work, though related to gravity, he also described the three laws of motion. The work is considered one of the most important in the history of science. Not only did it introduce the theory of gravity, it defined the principals or laws of motion in modern physics. The theory of gravity ultimately was used to explain the movement of the planets and the Sun.

All objects have gravity, though some objects have much more gravity than others. For example, the Sun and the Earth have much more gravity than other objects. The amount of gravity an object has depends on the size of mass of the object and how close a person is to the object. The closer the stronger the gravity.

Gravity may not seem important, but without gravity people would fall off of the Earth, and a kicked ball would go on forever. People could not live without gravity. In addition, it is important in other areas as well. It is the Sun's gravity keeping the Earth in orbit, allowing it to be the perfect distance from the Sun to support life, never getting too hot or too cold, receiving enough life to keep organisms alive, including humans.

The weight of a person is actually the amount of force the gravity has on a person and how hard it is pulling their body toward the Earth's surface. The heavier the person the more gravity pushing on the person. On the moon, the push of gravity is much less, so a person's weight on Earth would be much different than on the moon. This is why when man walks on the moon it is much easier to move. If a person weighed 100 pounds on Earth their weight on planet Mars would be just 38 pounds because there is less gravity. And where there is no gravity, like on the space station, the astronauts will just move through the air.

Where there is gravity; however, all objects will fall at the same speed. This is called the **equivalence principle**. Objects of different masses will fall to Earth at the same speed. For example, if two balls of different masses are dropped from a tall building, both of them will hit the ground at the same time.

Other things affected by gravity include the ocean tides, which are due to the gravitational pull of the moon on Earth. Gravity also affects a ride on a roller coaster or a skydiver dropping from an airplane. The force of gravity is more easily felt.

In summary, Isaac Newton is responsible for introducing the mathematics behind the concept of gravity, which led other scientists to understand the movement of the Sun and the planets, the different forces of gravity and the variables involved, as well as the introduction of the three laws of motion in modern day physics. All objects fall at the same speed, and the pull of gravity depends on the mass of an object and how close a person is to an object.

Top of Form

1) The first person to mathematically describe gravity was which of the following?

**A:** Isaac Newton

**B:** Albert Einstein

**C:** Man who dropped a rock on his foot

**D:** Both A and B

2) The theory of gravity also led to which other laws in physics?

**A:** Motion

**B:** Weight

**C:** Planets

**D:** Sound

3) Which of the following is a variable related to gravity?

**A:** Length of an object

**B:** Size or mass of an object

**C:** Condition of object

**D:** Material of an object

4) Which of the following is a TRUE statement?

**A:** The lighter the person, the more gravity pushing on the person.

**B:** The heavier the person, the less gravity pushing on the person.

**C:** The heavier a person, the more gravity pushing on the person.

**D:** The weight of a person has no effect on the amount of gravity pushing on them.

5) If an object weighed 1,000 pounds on Earth, how much would it weigh on Mars?

**A:** 100 pounds

**B:** 3,800 pounds

**C:** 380 pounds

**D:** 1,000 pounds

6) All objects will fall at which the following speeds?

**A:** Different

**B:** Variable

**C:** Unknown

**D:** Same

Bottom of Form