Sample Lesson #3

Newton's Third Law of Motion

Newton's Third Law tells us this: "For every action there is an equal and opposite reaction." Another way of stating this is to say that forces always occur in pairs. As you are sitting in your chair right now your weight exerts a force on the chair. The chair holds you up by exerting an equal but opposite force on you! When you jump into the air you are experiencing Newton's Third Law. As you push down on the ground, the ground pushes back on you, causing you to move up into the air. The harder you push down, the greater the ground pushes back, and the higher you will jump! When you push on a chair, the chair pushes on you. You push on the ground, and the ground pushes on you. Remember, forces always happen in pairs.

It is important to remember that the two paired forces are equal in magnitude (size), but this does not mean that the end result will be the same for both objects. An example of this is the launching of a rocket. A rocket launches when the exhaust from the engine pushes against the Earth. This creates an equal force in which the Earth pushes against the rocket. Both the rocket and the Earth are feeling the same force, yet only the rocket moves. This is because the rocket is much smaller than the Earth. The force they both feel is enough to move the rocket but not enough to move the Earth.

1. Write Newton's Third Law of Motion.

_____

_____

2. Forces always occur in pairs. When a rocket is launched upward, what pair of forces is acting on the rocket?

   A) the rocket fuel burning and gravity pulling the rocket toward Earth

   B) the atmosphere pressing down and the moon orbiting Earth

   C) exhaust from the engine pushing against the ground and the Earth pushing against the rocket

   D) the astronauts leaning against their seats and their seatbelts holding them in place

3. An organism's _____ is the actual place where it lives.

migration habitat climate atmosphere

4. One of the processes that is part of the water cycle is **transpiration**. List three others.

_____ _____ _____

5. Newton's second Law states that the amount of force an object needs to accelerate depends on two things: the mass of the object and how much acceleration there will be. Which of these would require the greatest amount of force to roll it a distance of one meter across a wooden floor?

baseball golf ball bowling ball marble

6. Circle the illustration that shows the new moon.

7. Match each type of tissue with its description.

_____ epithelial	A) sends messages from the brain and spinal cord to all parts of the body
_____ connective	B) contracts and relaxes to allow the body to perform voluntary and involuntary functions
_____ muscle	C) provides a protective lining to several organs and covers the entire outside of the body
_____ nervous	D) provides support and structure; connects one kind of tissue to another

8. Use these terms to complete the following sentences.

malleable semiconductors metalloids nonmetals brittle

Metals are _____ (bendable) but nonmetals are often _____.

_____ can be shiny like metals but don't conduct electricity as well. They are known as _____.