FORCE

Name _____

Date _____ Period ____

Changing Motion and Turning

According to Newton's First Law, an object in motion continues moving in a straight line unless it is acted on by a force. Planets orbit the sun in an almost circular path. They are not violating Newton's First Law. They are obeying Newton's Second Law. The sun is exerting a force on the planets that keeps them revolving.

Force and acceleration are directional. A net force opposite an object's motion is negative and produces a negative acceleration, slowing the object down. A net force in the same direction as an object's motion is positive and produces a positive acceleration, speeding the object up. A net force at an angle to an object's



motion will cause the object to change direction. If a force is maintained on an object at an angle to it's motion, it will cause it to follow a curved path or turn. When an unbalanced force is applied to an object at right angles to the object's motion the object travels in a circle. Such a force is called a centripetal force. A centripetal force is toward the center of the object's circular path. This is what keeps planets moving around the sun.

Answer the questions below based on the reading above and on your understanding of Newton's Second Law.

- 1. A man tosses a pebble straight up into the air. What happens to its speed after it is tossed? Explain.
- A man tosses a pebble straight down towards the ground. What happens to its speed after it is tossed? Explain. 2.
- A piece of space junk speeds by earth moving too quickly to be pulled to earth, but too slowly to escape from earth's 3. gravitational pull. What does it do. Explain.
- A 10 kg object is moving southwest at 35 m/_{e} . What will happen if it is acted on by an unbalanced force of 4 N in the 4 following direction:
 - a. southwest?_____

b. northeast?

- c. northwest?
- You are swinging a weight around your head by holding it on a string (as shown): 5.
 - Why does it move in a circle? a.
 - What happens if you let go of the string? b.

