Physics – Resource

Week 2

Day 4 and 5 – (Newton's Three Laws of Motion) Follow instructions and perform activity. Write answers and observations on a separate piece of paper (in complete sentences).

***** All work will be collected when we return**

Physics

Days 4 and 5

Sir Isaac Newton studied other scientists' ideas and thoughts a lot about how things on Earth and in the universe move. After a great deal of work, he developed three important laws that explain how and why things move as they do. His three laws of motion are:

1. An object at rest will stay at rest, and a moving object will keep moving until a force acts on the object.
2. An object accelerates because a force acts upon it (f=ma)
3. For every action there is an equal and opposite reaction

In this activity, you will make a maze and use a marble to investigate these laws.

You will need

- Flat lid of a shoe box (or any cardboard box)
- 4 of each of the following sized rectangles (made from oak tag, index cards, or manila folders) 1 by 2 inch, 1 by 3 inch, and 1 by 5 inch
- Masking tape
- 2 small marbles
- Pencil
- 3 index cards

What to do

1. Label each of your index cards with a different law of motion (3 laws, 3 cards)
2. Create a maze by taping the rectangles to the inside base of the box (all walls should be 1 inch high). Make the tape the same length as the long side of the rectangle. Place the tape on a long side of the rectangle so half the tape sticks to the rectangle and half does not. Tape the rectangle to the inside base of the box so that it stands up. Secure the rectangle by taping its opposite side to the base.
3. Continue taping the rectangles to the base to complete the maze. Leave spaces so a marble can travel from one end to the other.
4. Conduct the following three steps with the marble:

- Place the marble in the maze so that it is still. How can you make the marble move? How can you make the marble move faster? What is the force responsible for making the marble move?
- Place the marble at rest. Why does the marble stay still? Tilt the box and observe. What causes the marble to move? What causes the marble to stop or slow down?
- Place one marble in the maze. Roll another marble into it. What happens to the two marbles? Where does the energy of the first marble get transferred?

5. After you have done these three tasks, look at your index cards that contain Newton's laws of motion. Match each law to a different step you performed. Explain your choices.