

Lesson 13: Forces & Motion
Text: Science Directions 7 : pp. 146-155
Posted by: Week 13
Due Date: Week 13



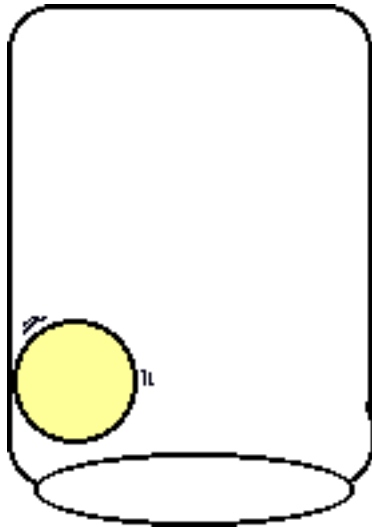
Objectives:

- students will come to understand that the manner in which the direction and strength of two forces acting on an object in opposite directions cause a change in the object's motion. Students will also find a way to measure these forces.

Discussion?: One on page 2.

Thought Stimulator

Remember, the Thought Stimulator is just for fun. =)



“ Get a wide-mouthed jar and a ping-pong ball. Put the jar upside down over the ball on a table and start to move the jar with circular motion. The ball should move around the edge of the jar and start climbing inside as it swirls around. Keep swirling and lift the jar off the table. The ball will stay inside! Why? The ball's inertia -- it wants to go in a straight line -- is countered by the inward force (centripetal force) exerted by the jar. That force makes the ball go in a circle.”

Science Is, p. 49

Did you try this? Go ahead...check it out!



Last week, you encountered many different forces in the experiment you did. In the next few weeks, you will be learning about different kinds of forces. If you were able to do the above activity, you would have experienced forces acting in two different directions, which caused the ball to move in a circular direction. In this learning event, you will be learning about forces acting in two directions, and how that affects the movement of things.

Read pages 146 and 147 in your Science Directions Textbook to find about forces in different directions and balanced and unbalanced forces. In your notebook write the meaning of balanced forces, friction, and unbalanced forces.

Discussion

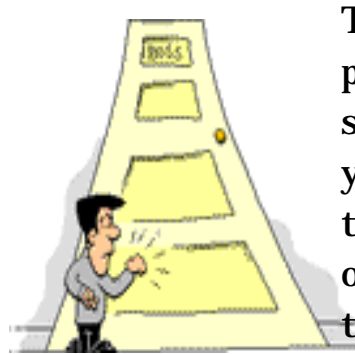
sc7.13- Discussion #1

What are some situations that you can think of where forces are acting in more than two different directions? Hint: Think that gravity, and friction are two forces... what is a situation where both of these forces are acting on an object while you apply another force...

Carefully read pages 148 and 149 to learn what a force meter is, then do Activity 3-3 (you do not need to answer the Finding Out More questions but you need to answer the Finding Out questions) on page 150. This activity may take a while... you will need to be creative to find things around your house that will work well for your force meter. Don't get discouraged, give it time.

When doing Activity 3-3, it is very important that your force meter show the strength of the force by how much the stretchy material (ie elastic or spring) is stretched. Usually, the more stretched it is, the more force is required. Make sure you keep your force meter... you will need it for upcoming lessons. :-)

Read Investigating Forces on page 150, then do activity 3-4. (You probably won't have a locker, and maybe not a filing cabinet as well... if so, exchange what you measure with something that you do have that is similar in your house.)



Turning a door knob may not seem like a push or pull force, but it actually is. To help you see this, stand facing the side of the door knob. Now put your hand on the top part of the knob and pull toward you. If you pull hard enough, the door will open. You can also put your hand on the bottom of the knob and push... again the door should open.

Read page 153, and if you can find 100 g weights do Activity 3-6 on page 154. (If you don't have weights, read carefully through the activity, and think of how you would calibrate your force meter. If you happen to have a fish scale in your house, get it out and take a look at it. That is an example of a calibrated force metre. What units does it use to measure weight?)

Do Checkpoint #s 1,2,3,6 (page 155) then check your answers with those at the end of the lesson (Answer Set #1):

Your Assignment:

Your assignment is to email me a description of your force meter. Be sure to “draw” it with the graphics/drawing tools in Word. Your force meter may take some time, so use any extra time that you have in this lesson to work on that.

Force Meter written description.....20 points

Force Meter drawing.....10 points

Answer Set #1

1. a)friction
 b)unbalanced
 c)standard
 d)balanced
 e)resistance

A force is a push or pull that causes an object to move, or stop, or change its speed or direction of movement.

2. a) push downward
 b) push sideways
 c) push downward with feet
 d) pull downward, upward, or forward

3, Your answers will be different from person to person. Here is an example: In skiing, the sliding on snow involves the force of friction on the skis. The downward descent of the skier is caused by the force of gravity pulling on him or her. Forward and downward motion is helped along by the skier’s pushing the ski poles against the snow. The skier can also use push with the poles to change direction.

6.
 - a) It is called gravity
 - b) They are balanced when the spring or rubber band stops stretching.
 - c) The forces are unbalanced as long as there is movement of the spring or elastic.