

Action-Reaction Lab

Name _____ Date _____ Group _____ Period _____

Most of you have blown up a balloon, and instead of tying the open end shut, you let it fly across the room. This is a simple, yet excellent example of Newton's third law of motion at work. You've also seen how different shaped objects can fall at different rates, if one has more air resistance than the other. You will use this information to formulate your hypothesis in this lab.

Objective:

To have an empty, 2-liter soda pop bottle travel over a measured distance in the shortest possible time. The bottle will be attached to a soda straw. The soda straw will have a length of string running through it. The bottle will then travel along a length of fishing line or thread after being filled with air, and the air inside then being allowed to escape. Somehow, you must come up with a way for your bottle to travel from start to finish in the quickest way possible using only the pressure of air inside it, to propel it forward. The teacher will pressurize all bottles with the same amount of air using a tire pump. A popsicle stick attached to the top of the straw, will pass through a photogate to record the time. This information will be used to calculate the speed of the bottle. No part of the empty, 2-liter soda pop bottle can be removed to lessen its mass.

Problem: What specific modifications to the bottle will allow it to traverse a given distance in the fastest time?

Hypothesis :If _____

Variables: By the time you finish this experiment ,you will need to identify the different types of variables present in this investigation. Consult your notes for definitions of the types of variables.

Independent Variables: _____

Dependent Variables: _____

Controlled Variables: _____

Materials: empty, 2-liter soda pop bottle of equal size; 1 soda straw, tape, paper,cardboard,scissors.

Procedures:

1-Make a preliminary sketch of what your plan will look like. In your sketch, you will need to clearly label what everything is. Show this in the space labeled, "Preliminary Design"

2-Show your completed sketch to your teacher. If necessary, you may have to revise your plan if your teacher notices something that could disqualify your group's plan. Only after the teacher has initialed your plan , will you be allowed to proceed with getting the remaining materials.

3-If it's necessary to make minor changes in your design, show these in the space labeled, "Final Design"

Preliminary Design

Final Design

Class Results

Group	Distance Traveled cm	Time in seconds	Speed cm/sec	Group	Distance Traveled cm	Time in seconds	Speed cm/sec
1				9			
2				10			
3				11			
4				12			
5				13			
6				14			
7				15			
8				16			

