***Activity #1: A Day at the Races***

In this experiment you will create a balloon rocket! You will figure out how to shoot the balloon from the back of your classroom and hit the blackboard with it at the front of the room. You will do this using a fishing line as a track for the balloon to follow.

bulletMaterials

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| • balloons (one for each team) • plastic straws (one for each team) • tape (cellophane or masking) • string, 10 meters in length • a stopwatch • a measuring tape | balloon rocket |

Procedure



*This is a race.* The race will be timed and a winner determined.

1. Divide into groups of at least five students.   
2. Attach one end of the string to the whiteboard with tape. Have one teammate hold theother end of the string so that it is taut and roughly horizontal. The line must be heldsteady and may not be moved up or down during the experiment.   
3. Have one teammate blow up a balloon and hold it shut with his or her fingers. Have anotherteammate tape the straw along the side of the balloon. Thread the string through the straw and hold the balloon at the far end of the line.  
4. Assign one teammate to time the event. The balloon should be let go when the time keeper yells “Go!” Observe how your rocket moves toward the whiteboard.

5. Have another teammate stand right next to the whiteboard and yell “Stop!” when the rocket hits its target. If the balloon does not make it all the way to the whiteboard, “Stop!” should becalled when the balloon stops moving. The timekeeper should record the flight time.   
6. Measure the exact distance the rocket traveled. Calculate the average speed at which the balloon traveled. To do this, divide the distance traveled by the time the balloon was “in flight.” Fill in your results for Trial 1 in the Table below.   
7. Each team should conduct two more trials and complete the Table for Trials 2 and 3. Then calculate the average speed for the three trials to determine your team’s  
race entry time.

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| Trial | Distance | Time | Speed |
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Post lab Questions:

1. What made your rocket move?
2. How is Newton’s 3rd law of motion demonstrated by this activity? (at least 3 sentences)
3. What do you think caused some balloon rocket to be faster or slower than other balloon rockets?
4. What are some variables you needed to hold constant throughout the three trials?