Balloon Blow Up

WHAT ARE WE INVESTIGATING?

How can you blow up a balloon without blowing air into it?

MATERIALS:

- Empty water bottle
- Baking Soda
- Vinegar
- Teaspoon
- Balloon
- Funnel (if needed)
- String/Yarn/Wool
- Ruler/Measuring Tape
- Strive Academy's Engineering Design Process Handout (found at www.striveacademy.org)
- Pencil or Pen

EXTENSION:

* Try this variable - use a 2-liter bottle instead of a small water bottle. How does this affect your experiment?

* Draw something fun on your balloon and see what it looks like when it is blown up.

* Fill one balloon up using this cool experiment and tie it off. Fill another balloon up by using your own carbon dioxide gas (blow it up) to about the same size. Hold both balloons at arms length from your body and let go! Make observations about how they fall differently.

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DIRECTIONS:

1. Gather all your materials. Our materials are just suggestions - feel free to add other things too!

2. On your handout (found at www.striveacademy.org), fill in the title of your experiment (Balloon Blow Up).

3. On your handout, fill in your hypothesis. You want to answer the question: Does the size of the balloon change if you change the amount of baking soda and vinegar?

4. On your handout, draw a sketch of what you think will happen when you add baking soda and vinegar into your balloon.

5. Measure out 1 teaspoon of vinegar and pour it into your empty water bottle.

6. Measure out 1 teaspoon of baking soda and pour it into a deflated balloon (use a funnel if needed).

7. As carefully as you can, stretch the balloon around the top of the flask, but be careful not to dump any baking soda in just yet.

8. When you are ready, one person should lift up the balloon to dump the baking soda in. The other person should measure the circumference of the balloon using the string/yarn/wool. The easiest way to do this is to start at one end of the string and wrap it around the balloon. Hold your finger where the circumference stops. Then use a ruler or measuring tape to see how long your string measures.

9. Under "Data Collection/Observation", draw a picture of what your balloon looks like when it is inflated. Feel free to use color!

10. Under "Results", draw a table with the following columns: amount of vinegar, amount of baking soda, and circumference of balloon. Add your data from #8.

11. Repeat steps 5-10 with different amounts of vinegar and baking soda. Dump out the vinegar and baking soda in between each trial.

12. Answer the "Analysis" questions on your handout:
    - Did the amount of vinegar and baking soda affect the size of the balloon? How?
    - This is an example of an acid-base reaction which creates a gas called carbon dioxide. Where does the carbon dioxide go when it is formed?
    - Vinegar and baking soda have chemical potential energy. Does the amount of energy increase or decrease as you add more vinegar and baking soda? How do you know?

** Try the extension activities on the first page for more fun! **