



## EPISODE 1: BOTTLE BOATS ACTIVITY

*Engaging with science is fun and what better time to do it than summertime!*

### Supplies

- An empty plastic bottle
- Baking soda and vinegar
- Napkin
- Tack
- Scissors
- Duct tape, markers or other decorative materials (optional)
- Bathtub, kiddie pool or other large tub filled with water

Note: Don't mix materials that you do not know how they will react. NEVER use household cleaners in this experiment.

### STEP-BY-STEP DIRECTIONS

Step 1 - Decorate your bottle

Step 2 - Have a parent help push a tack through the center of the bottle's cap

Step 3 – Cut a square out of the napkin

Step 4 – Place approximately 2 tsp of baking soda in the center of the napkin and fold the edges around the baking soda, making a small envelope

Step 5 – Put approximately ½ cup of vinegar into the empty bottle

Step 6 – Quickly place your envelope of baking soda into the bottle, replace the cap, put your thumb over the hole in the cap and shake a few times.

Step 7 – Place in water and try to measure how far it travels

## KEY PRINCIPLES

Baking soda is a basic compound called sodium bicarbonate. Vinegar is a diluted solution (mostly water) that contains acetic acid. The two chemicals react chemically because baking soda is a base and vinegar is an acid.

When the baking soda and vinegar are mixed together, the hydrogen ions in the acetic acid mixes with the bicarbonate ions in the baking soda to form two new chemicals: carbonic acid and sodium acetate. These two new chemicals then react immediately to form water and carbon dioxide gas.

Propulsion means to push or drive an object forward. This effect is explained by Newton's third law of motion: For every action there is an equal and opposite reaction. When the gas escapes the bottle, the bottle moves in the opposite direction.

## SHARE YOUR EXPERIMENT FUN

Did your experiment go as planned? Were there any surprises? What might you do differently next time? Tell us about your experience through words and pictures! Email the Community Relations team at [communityrelations@andersencorp.com](mailto:communityrelations@andersencorp.com).

Post your photos on social media, tagging Andersen and using #AndersenWindows with #SummerScience.

***Thanks for joining our Andersen scientists and adding STEM into your summer!***