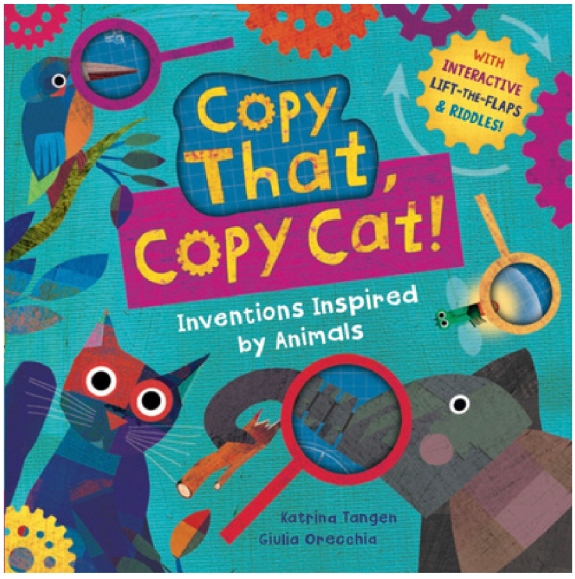
HANDS-ON SCIENCE ACTIVITIES



COPY THAT, COPY CAT!

INVENTIONS INSPIRED BY ANIMALS

KATRINA TANGEN

SODA CAN SUMBARINE

SUPPLIES

- Tall vase, pitcher, or pot
- Plastic tubing or an extra long straw
- Empty soda can

INSTRUCTIONS

1. Add water to the vase until ¾ full.

2. Place one end of the tubing in the soda can.

3. Fill the soda can with water. Place it in the vase. Add extra water if necessary to make it completely full so it will sink.

4. Blow air into the tube and watch your submarine rise!

(*Watch out! If your end of the tubing is below the water line, water will come out when you stop blowing.)*

What happened?

Just like in a real submarine, when you add air, it rises, and when you let in water, it sinks.

Why?

Adding air makes the submarine lighter compared to its size, so it floats. Adding water makes it heavier compared to its size, so it sinks.

Source:
Adapted with permission from The Science Kiddo blog by Crystal Chatterton, https://www.sciencekiddo.com/soda-can-submarine/

SNOWSHOES

SUPPLIES

- Shallow dish
- Flour or kinetic sand
- 1 or more plastic toy animals or dolls
- Cardboard
- Tape

INSTRUCTIONS

1. . Fill the dish half-full with flour (loosely—don't pack it down) or kinetic sand. This is your "snow."

2. Place your toy on the snow without pushing on it. Notice:
   - How big are the footprints?
   - How deep are the footprints?
   - If you have more than one animal, notice if some are different than others.

3. Press your toy into the snow. Notice:
   - Is it hard to push the toy into the snow?
   - How big are the footprints?
   - How deep are the footprints?

4. Ask an adult to cut the cardboard into snowshoes or extra-large paws for your toy. Tape them to the toy's feet.

SNOWSHOES (CONTINUED)

5. Find a clear area of snow, fill a second dish, or smooth and fluff your original snow. Place your snowshoed toy on the snow without pushing. Notice:

- How big are the footprints?
- How deep are the footprints?

6. Press the snowshoed toy into the snow. Notice:

- How big are the footprints?
- How deep are the footprints?
- Was it easier or harder to push the toy wearing snowshoes?

What happened? Why?

Toys wearing snowshoes don't sink in as far and are harder to push in. Their weight is spread out over the bigger footprint, so they don't push down as hard in any one place.

Sources:
Dees, Sarah, *Frugal Fun for Boys and Girls* blog, https://frugalfun4boys.com/science-experiment-how-snowshoes-work/
Children's Science Center, https://www.childsci.org/test/how-snow-shoes-work

LIFT: HOW PLANES FLY

Bird and plane wings are curved on top and flat on bottom. According to Bernoulli's Principle, this airfoil shape causes lift.

SUPPLIES

- 1 rectangular strip of paper (around 1.5x8 inches)

INSTRUCTIONS

1. Predict: Will blowing across the top of the paper make it go up or down?

2. Hold the short end of the paper below your bottom lip.

2. Blow evenly across the paper.

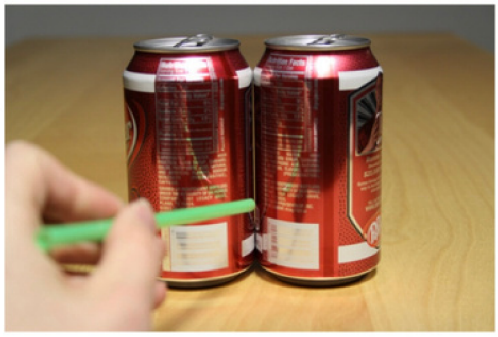
Tip: If it doesn't work, you may be blowing too hard. Or you might need to angle your breath down more, towards the top of the paper.

What happened? Why?

It seems like blowing on top should make it go down, but it makes it go up! This is because the faster air has lower pressure, so the higher pressure underneath pushes up.

Watch this video from the Air & Space Museum to see a demonstration and learn more: https://www.youtube.com/watch?v=3b9xCC_vaZQ

LIFT #2: MAGIC SODA CANS



SUPPLIES

- 1 straight drinking straw
- 2 empty soda cans

INSTRUCTIONS

1. Predict: Will blowing between soda cans move them apart or together?

2. Place 2 empty soda cans on a table, close but not touching (about ¾ inch apart).

3. Position the straw in front of the gap (don't stick the straw in-between the cans), aiming about an inch from the bottom.

4. Blow through the straw.

What happened?

It seems like blowing between the cans should make them spread apart, but they come together!

Why?

The air you blow through the straw moves faster than the rest of the air in the room. Faster air has lower pressure, so the stronger air pushes the cans together. That's the same thing that happens when air goes around a bird or airplane wing, causing lift!

Find the above photo and other fun lift experiments in this NASA educator's guide: http://tinyurl.com/3vzzssz3