



# DANCING POPCORN

## Grade Level

2-6

## Length of Lesson

30 minutes

## Objective

By the end of this lesson, students will have a better understanding of a variety of scientific concepts.

## Materials

- Copies of student worksheets
- Clear glass jars
- Baking soda
- Vinegar
- Water
- Popcorn kernels
- Spoons
- Measuring cups/spoons
- Paper towels

## Standards

### NGSS

2-PSI; 3-PSI-2; 5-PSI-1-2,4; MS-PSI-2

## Lesson Summary

This lesson is designed to help students strengthen their understanding of a variety of scientific concepts like chemical reactions, the scientific method, density, and buoyancy.

## Suggested Sequence of Events:

1. Set Up: Print enough copies of the student worksheet so that every student has one. Students can work individually or in small groups of 2-3. Each student or small group will need the following measurements of the materials:
  - Clear glass jar that will hold at least 3 cups of liquid
  - 2 Cups of water
  - 2 Tablespoons of baking soda
  - 1 cup of vinegar
  - Popcorn kernels (a couple tablespoons worth)
  - 1 spoon
  - Paper towels
  - *Optional: Funnel*
2. Read [11 Experiments That Failed](#) by Jenny Offill to capture student interest and talk about how to complete experiments.
3. Read through the [IAITC Corn Ag Mag](#) to learn more about different types of corn and corn products. Interactive online versions can be found on our website.
4. Complete the activity following the procedures:
  - Give each student a copy of the student worksheet. Read through the introduction together.
  - Hand out materials and have students work through the procedures.
    - *Point out that they'll need to make their predication after step 5 of the procedures.*
  - When they are finished with the experiment, have them write their conclusion to answer the question. Was their prediction correct?
5. Whole class discussion and reflection of activity.

# TEACHER RESOURCES

## Background Information

- When the vinegar (acid) mixes with the baking soda (base) it causes a chemical reaction. This chemical reaction creates Carbon Dioxide, which gets trapped in bubbles. The bubbles attach themselves to the popcorn kernels and lift the kernels to the top of the water. The bubbles pop when they reach the surface of the water and the kernels sink back down to the bottom. This happens over and over again until the chemical reaction is done.
- The bubbles are less dense than the water, causing them to rise to the surface. The popcorn kernels are more dense than water which is why they start at the bottom of the jar until the vinegar is mixed in and then kernels sink after the bubbles pop at the surface.

## Tips

- If students pour the vinegar too quickly, the chemical reaction will cause the bubbles to overflow.
- When the reaction starts to slow down, have students stir the solution again and observe what happens.

## Extension Ideas

- Use other materials as variables to compare results. Do cranberries or raisins behave the same way as popcorn kernels in this experiment? Would changing the type of vinegar change the chemical reaction? How does seltzer water/soda compare to the reaction caused when mixing the baking soda and vinegar?
- Learn more about other chemical reactions. What happens with the molecules of substances when they undergo a chemical reaction? How is this different than a physical change like water going through the various states of matter?
- Talk through the process of the scientific method. Why do scientists all follow the same steps when completing experiments?
- Compare the density and buoyancy of other objects in water.
- Learn about the history of popcorn. How is popcorn different than sweet corn and field (dent) corn? Why does popcorn even pop?
- Check out IAITC's [Popcorn Reader](https://www.iaitc.org/Popcorn-Reader), available at [agintheclassroom.org](https://www.agintheclassroom.org).
- Go to [agintheclassroom.org](https://www.agintheclassroom.org) to contact your County Ag Literacy Coordinator for free classroom sets of our Ag Mags!



Science

# DANCING POPCORN

## STUDENT WORKSHEET

**Introduction:** Scientists are always observing, asking questions, and doing experiments and tests to find the answers to their questions. It's your turn to be a scientist! Use this worksheet to help guide you through this experiment to answer the question.

### QUESTION

What happens when you add vinegar to a jar of baking soda, water, and popcorn kernels?

### PROCEDURES

1. Use the checklist to the right to make sure you have all your materials.
2. Add 2 cups of water to the clear jar.
3. Add 2 tablespoons of baking soda to the water.
4. Use the spoon to stir the water and baking soda together. Stir until all the baking soda is dissolved.
5. Carefully drop the popcorn kernels into the clear jar.

### PREDICTION

What do you think will happen when you add the vinegar to the jar?

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6. Measure 1 cup of vinegar.
7. **Slowly** pour the vinegar into the jar. It will overflow if you pour too fast!
8. Watch what happens. Use the diagram to the right to draw what you are observing.

### CONCLUSION

What happened in the jar when you added the vinegar?

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### MATERIALS

- Water
- Baking soda
- Popcorn kernels
- Vinegar
- Clear jar
- 1 cup
- 1 tablespoon
- Spoon

### OBSERVATION

Draw what you see.

