



Science Fair Investigation



Prep **10** minutes



Activity **45** minutes*



Grades **K-2**

OBJECTIVE:

To introduce students to the process of planning and conducting a science fair project about germs and the spread of disease.

MATERIALS:

- Science Fair Investigation Handout
- Science Fair Project About Germs Handout
- Sandwich bags
- Antibacterial soap
- Regular soap
- Hand sanitizer

EDUCATION STANDARDS:

Health: 8.2.2 Encourage peers to make positive health choices.

7.2.1 Demonstrate healthy practices and behaviors to maintain or improve personal health.

Science: A.1.b Plan and conduct a simple investigation.

**plus time to conduct and present experiments*

INSTRUCTIONS

NOTE: Science Fair Investigations can be done in small groups, as a class, or as a take-home project.

1. Review the *Science Fair Investigation* handout with students. Explain that they, too, will do a science fair project about germs.
2. Explain that science experiments often start with a question a scientist wants to figure out the answer to. Read the questions and have each student circle the question they want to explore on their handout.
3. Explain that scientists usually have some idea about what they think the answer to their question might be. Have students write their guess about their research question on the handout.
4. Explain that most science experiments have variables that the scientist changes to see what happens in the experiment.
5. Read the steps for the experiments to students (see *Science Fair Project About Germs* handout). Have them determine what the variable is that they will change and write it on their *Science Fair Investigation* handout.
6. Explain that in experiments, scientists try to control all other variables so they know what caused any results. Ask students to name some possible variables that they will need to control in their experiment. Have them write these on their handouts.
7. Use the *Science Fair Project About Germs* handout to guide students as they conduct their experiments - each experiment follows the same basic procedure, using different variables.
8. Have students conduct their experiments over the course of two weeks. Check in with students frequently. Remind them not to open the sealed plastic bags, as the mold or bacteria growing inside could be unhealthy.
9. Ask students for ideas about how they can record their observations each day when they look at the experiment. Can they describe what they see in words? Can they draw it, make a graph, or photograph it?
10. Ask students for ideas about how they can share their results with the rest of the class. Can they tell them about it? What visuals could they show to make it clearer? Would it make sense to show a video, photographs, or actual experiment?
11. Toward the end, discuss the information that students should include in their displays and presentations. What information is important to include (title, research question, hypothesis, procedure, variables, display of results, conclusion)?
12. Demonstrate how to make a basic display board out of cardboard or other sturdy materials.
13. Before students begin adding information to their boards, have them sketch out what will go where and write or type the information they intend to include. Meet with each student before they begin work on the actual display board to check their sketches and text.
14. For the science fair, display the boards around the room and invite parents to visit. Allow time for students to present their results to the class.



Interactive Whiteboard Extension

1. Write the basic steps for the scientific process on the whiteboard.
2. Have students drag and drop steps from their experiment to match each step in the process.



Science Fair Investigation

Ella was excited. They were going to have a science fair!
"What project should we do?" Harry asked.
"What do you want to learn about?" Johnny asked.
"I have lots of questions about germs," Ella said.
"OK!" Harry said. "Let's investigate germs for the science fair."



Help Ella, Johnny, and Harry get ready for the science fair.
Circle the question you want to explore.

1. Does washing your hands remove germs?
2. Does antibacterial soap remove more germs than regular soap?
3. Does washing your hands for longer remove more germs?
4. Does hand sanitizer get rid of germs better than soap and water?

1. Write your guess about the answer. _____

2. Write the variable you will change. _____

3. Write the variables you won't change. _____



Case Report: Every good investigator writes case reports. Case reports tell what you found. Write one way to keep from spreading germs.



Science Fair Project about Germs



Join the Clean Club and investigate
how handwashing affects germs!
Follow the steps below to conduct your experiment.

Materials:

- Potato, cut into slices
- Sandwich bag
- Antibacterial soap (needed for questions 1, 2, and 4)
- Regular soap (needed for questions 2 and 3)
- Hand sanitizer (needed for question 4)

Circle the question you are testing:

1. Does washing your hands with only water remove germs? *Variables: unwashed, washed*
2. Does antibacterial soap remove more germs than regular soap? *Variables: antibacterial soap, regular soap*
3. Does washing your hands for longer remove more germs? *Variables: 3 second wash, 20 second wash*
4. Does hand sanitizer get rid of germs better than soap and water? *Variables: hand sanitizer, antibacterial soap*

Background Information:

Microbes, or germs, are too small to see without a microscope. But if many of them grow together, sometimes the group of them gets big enough that we can see it. The more microbes there are, the faster they will grow big enough to see. We can use this fact to test for microbes.

Steps:

1. Have an adult clean, peel, and slice the potato using a clean knife. You need four slices (except for question 1, which needs only 3). Place each slice into an unopened sandwich bag using a fork. Do not touch the potatoes with your hands.
2. Seal one of the bags and label it "Untouched."
3. Hold one slice of potato in your hand and rub your hands all over it.
4. Put the slice back in the bag. Seal the bag and label it "Unwashed."
5. Wash your hands with your first variable (Question 1: 20 second wash with antibacterial soap; Question 2: antibacterial soap; Question 3: 3 second wash; Question 4: sanitizer).
6. Hold one slice of potato in your hands and rub your hands all over it.
7. Put the slice back in the bag. Seal the bag and label it with your variable. (If you are investigating question 1, skip to step 11.)
8. Wash your hands with your second variable (Question 2: regular soap; Question 3: 20 second wash; Question 4: antibacterial soap).
9. Hold one slice of potato in your hands and rub your hands all over it.
10. Put the slice back in the bag. Seal the bag and label it with your variable.
11. Put all the bags in the same cool, dark place.
12. Check the bags every day and record what you see. Do not open the bags at any time.
13. When the experiment is over, throw the bags away unopened.