



Science Fair Investigation



Prep **10** minutes



Activity **45** minutes*



Grades **3-5**

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
- Internet and library access for students
- Other materials as needed for student projects

EDUCATION STANDARDS:

Health: 4.5.1 Demonstrate effective verbal and nonverbal communication skills to enhance health.
8.5.1 Express opinions and give accurate information about health issues.

Science: A.1.a Ask questions about objects, organisms, and events in the environment.

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

A.1.e Communicate investigations and explanations.

*plus time to conduct and present experiments

INSTRUCTIONS

1. Have students read the *Science Fair Investigation* handout. Explain that they will follow the process outlined on the handout to design a science fair project related to germs and illness.
2. Review with students what they already know about germs.
3. As a class, brainstorm some questions students still have about germs.
4. Ask each student to select two questions that really interest them and research topics related to those questions using online and library resources. If new questions arise during their research, students should be allowed to change their questions.
5. Place students into small groups. If students are interested in the same topic, group them together, but it is not necessary for all groups to be organized around the same topic.
6. Have students share their research questions with their small group and brainstorm ideas for experiments to answer the questions. Small groups will brainstorm ideas for several topics, depending on the variety of topics within the group.
7. Have each student, working independently, select the research question they want to focus on for their project, and complete steps 5 through 11 on the handout to design their experiment.
8. Meet with each student to discuss the experiment design before students begin conducting their experiments.
9. As students conduct their experiments, remind them to repeat the experiment, if possible, to validate their results. Check in with each student periodically to review their data and head off any problems.
10. Introduce examples or images of past science fair projects. Brainstorm different ways students might present their data at the science fair. Brainstorm ideas for additional information they might include in their display.
11. For the science fair, display the boards around the room and invite parents or other classrooms to visit. Allow time for students to present their results to the attendees.



Interactive Whiteboard Extension

1. Have students create a PowerPoint presentation of their science fair project. They might include photographs of an experiment at different stages, charts, graphs, etc.
2. Have students present their presentation to the class using a whiteboard.



Science Fair Investigation

Ella, Johnny, and Harry walked quickly down the stairs in front of their school. They were very excited about the assignment their teacher had just given them.

"I can't believe that we get to work together on a science fair project!" Ella said.

"Me neither," Johnny said. "Do you guys have any ideas about what we should do?"

"I have NO idea," Ella answered. "I don't even know where to start."

"My mom is a research biologist, and she says that she starts any project with a question she wants to know the answer to," Harry said.

"That's a great idea!" Johnny said. "So what do you guys want to know?"

"Well," Harry said, "we have been learning a lot about germs since I got sick, but there is still a lot we don't know."

"Yeah!" said Ella. "Like why do some people who are exposed to germs get sick when others don't?"

"Or do some cleaning methods work better on some materials than others?" said Johnny.

"Or why are some illnesses common in other parts of the world, but not here?" Harry added.

"Well, it sounds like we definitely want to know more about germs and illness," said Ella. "Let's go brainstorm!"



Help Ella, Johnny, and Harry with their science fair investigation. Follow the steps below to design a science fair project about germs.

1. With your classmates, brainstorm a list of questions you have about germs and illnesses caused by germs.

2. Circle your two favorite questions.

3. Research topics related to your questions. Write any new questions below.

4. Brainstorm ideas for experiments that could answer the questions you have.

5. Write the research question you decide to explore.

6. Write a hypothesis or statement that you think will answer the research question.

7. Write what your independent variable will be.

8. Write what your controlled variables will be.

9. Write what your control will be.

10. Write the steps in your experiment.

11. Describe how you will measure and collect data.

12. Describe how you will display your data and publish the results of your experiment.



Case Report: Now that you have presented your science fair project, it is time to write your case report.

1. Did your experiment turn out as you expected? If not, what are some possible reasons? _____

2. If you were to do the experiment again what would you change? _____

3. Did this experiment make you think of any new questions that you might want to investigate? If so, what are they? _____