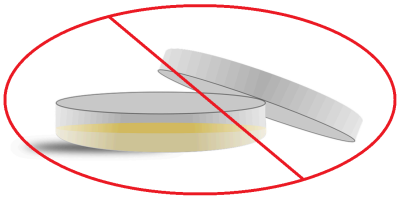
Battle That Bacteria!

BE SAFE

- Wear **rubber gloves**!
- Wear your **face mask**!
- Tape **petri dishes** shut! Do NOT remove lid once it is taped! Dispose of in sealed ziplock bag!







This project involves growing cultures of bacteria. Once you have grown your bacteria, DO NOT open the petri dishes. Tape them closed once bacteria is collected. Use the ziplock bag that the materials came in for disposal. Remember that you don't know what kind of bacteria you will be growing, and you don't want to expose yourself or your students to these germs!

Materials

Kit Supplies

- Rubber Gloves
- Face Masks
- Petri Dishes (12 dishes to be split evenly between 6 student groups)
- Agar Powder
- Bar Soap
- Transparent Graph Paper (6 sheets)

You Provide

- Cotton Swabs
- Transparent Tape
- Your Favorite Hand Sanitizer
- Your School's Hand Soap

PART 1

QUESTION

How do different disinfectants affect bacteria?

PERSONAL KNOWLEDGE

Have students write down at least three things that they already know about bacteria and disinfectants.

PREDICTION

After discussing personal knowledge, have students make a prediction to the question, "How do different disinfectants affect bacteria?"

INVESTIGATION PLAN

After showing students the video: Growing Bacteria—Sick Science! #210 (YouTube 2:11), have students collect bacteria using the following procedure:

1. Divide students into six groups.
2. As a class, select **six** different surfaces to test. Possible surfaces include door handles, keyboards, phone or tablet screens, or the bottom of shoes.
3. Assign each group a surface and a sanitizer (your school's hand soap, your favorite hand sanitizer, the bar soap in your kit, or another sanitizer of your choice).
4. Watch the instructional video found at Science Project—Growing Bacteria In A Petri Dish (YouTube 2:07).
5. Give each group two **petri dishes**. One will be unsanitized, and the other will be sanitized so that you can compare the bacteria growth.
6. Put on **rubber gloves** and **face masks**.
7. Dampen a cotton swab in water.
8. Rub all portions of the cotton swab on the surface to be tested.
9. Make a squiggly line on petri dish containing **agar**.
10. Close petri dish and tape it shut.
11. Label the plate with group member names, date, bacteria source location, and disinfectant type.
12. Dispose of your cotton swab.
13. Sterilize your surface using the group's selected sterilizer.
14. Repeat steps 6-11.
15. Allow plates to incubate in a warm, dark area away from windows. Depending on conditions, bacteria can take anywhere from three to ten days to grow a robust colony.

PART 2

OBSERVATIONS AND DATA ANALYSIS

Guide students in recording qualitative and quantitative observations and analyzing their data.

1. Display or hand-out the Observations and Data Analysis sheet.
2. Give student groups a sheet of transparent graph paper and have them measure to approximate the size of both unsanitized and sanitized germ cultures.
3. Have students record their results.
4. Use the Experiment Data Spreadsheet to record the results of the class and calculate the percentage of germs eliminated.
5. Discuss results and identify the disinfectants that effectively stopped germ growth.
6. Clean experiment areas thoroughly. Use the ziplock bag that the materials came in for disposal.

EXPLANATION

Using the data collected from the experiment, ask students to answer the question: How do different disinfectants affect bacteria?

Guide students to explain the answer to the question using a Claim, Evidence, and Reasoning structure:

Claim Which germicide is most effective?

Evidence What data supports this claim?

Reasoning

- Did you do a fair test?
- How do you know?
- What did you discover in your test?