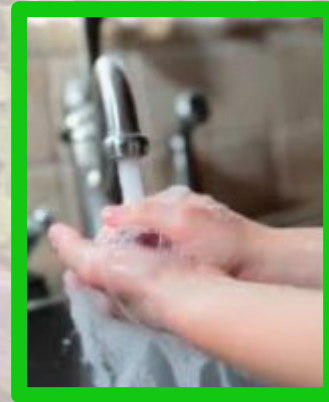


which is better at cleaning -
Hand Sanitizer versus Hand washing???



JOURNAL TIME



8 year old after playing outside



[Body Cheese Video](#)

USING THE SCIENTIFIC METHOD

- 1 QUESTION**
Ask yourself, "What do I want to learn more about?", or "I wonder what would happen if ...?"
- 2 HYPOTHESIZE**
Research to help you make an educated guess, or hypothesis, and then answer your question.
- 3 EXPERIMENT**
Test your hypothesis by making a plan and conducting an experiment.
- 4 OBSERVE & RECORD**
Make careful observations and write down what happens.
- 5 ANALYZE**
Use your information to draw conclusions about your experiment. Was your hypothesis correct?
- 6 NEXT STEPS**
What would you do next to further test your conclusion?

GERM EXPERIMENT: HAND WASH VS SANITIZER

1. Smear hands on bread.
2. Stick bread in bag.
3. Seal bag.
4. Make sure you sealed bag.
5. Really make sure you sealed bag.
6. Label bag: **BEFORE**
7. Either wash your hands or use hand sanitizer depending on what you hypothesized would work best.
8. Repeat steps 1-5
9. Label bag: **AFTER - SANITIZER OR WASH** (pick which one you used)

“Germs” refers to _____ organisms that can make you sick. Germs can also be called _____. There are four main categories of germs/ pathogens: _____, _____, _____, and _____. Many bacteria, protozoans, and fungi are _____ or actually helpful. A fungus is a simple organism that is not a _____ or an _____. Some familiar fungi are mushrooms, _____, mildews, truffles, and yeasts. Fungi cause three different types of human illness: _____, _____, _____, and _____. Athlete’s foot, yeast infections, and _____ are common ailments caused by fungi. Protozoa are one-celled _____ found worldwide in most habitats. Many of the most wide-ranging and deadly human diseases are caused by a _____ infection, including African Sleeping Sickness, amoebic dysentery, and _____. Bacteria help you _____ food, like plants, that your body can’t break down. You have as many _____ cells in your body as _____ cells. Bacteria are also useful as _____. Of the _____ types of bacteria that people come in contact with on a daily basis, only about 1-2 % are potentially dangerous to healthy people. Most viruses, on the other hand, cause us harm; like the _____, _____, and _____. Some viruses can even kill us; such as HIV/AIDS, smallpox, and _____. Viruses are like hijackers. They invade living, normal cells and use those cells to _____ and produce more viruses like themselves.

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WHAT ARE GERMS?

The term "germs" refers to microscopic organisms that can make you sick. Germs can also be called pathogens. There are four main categories of germs/pathogens: bacteria, viruses, protozoans, and fungi. Many bacteria, protozoans, and fungi are harmless or actually helpful.

FUNGI

A fungus is a simple organism that is neither a plant nor an animal. Some familiar fungi are mushrooms, molds, mildews, truffles, and yeasts. Fungi cause three different types of human illness: poisonings, parasitic infections, and allergies. Athlete's foot, yeast infections, and ringworm are common ailments caused by fungi.

Symptoms & Signs Of Fungal Infection



SKIN RASH



SKIN LESIONS



NAIL BED
INFECTION



ORAL THRUSH

PROTOZOA

Protozoa are one-celled animals found worldwide in most habitats. Infections usually occur via an insect bite (mosquito) or contact with a contaminated surface. Protozoan infections range from asymptomatic to life threatening. Many of the most wide-ranging and deadly human diseases are caused by a protozoan infection, including African Sleeping Sickness, amoebic dysentery, and malaria.

Malaria

Also called: plasmodium infection

ABOUT

SYMPTOMS

TREATMENTS

Fever
Chills



Spread by mosquitoes

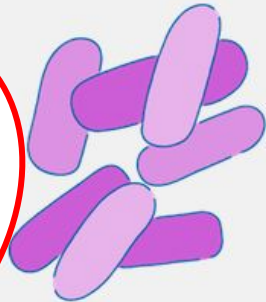
Source

BACTERIA

Of the 60,000 types of bacteria that people come in contact with on a daily basis, only about 1-2 % are potentially dangerous to healthy people

Not all bacteria are germs. Right now, you have trillions of bacterial cells in your body that are helping you stay alive. These bacteria help you digest food, like plants, that your body can't digest. Bacteria are also useful as decomposers (so we don't have a bunch of dead stuff lying around). On the other hand, there are also a whole lot of bacteria types that can make you very sick.

Draw and label these shapes in your journal



Bacilli
Rod-Shaped



Cocci
Spherical



Spirilli
Spiral-Shaped

You have as many bacterial cells in your body as human cells.

VIRUSES

Not all viruses are germs - but most of them are! A few viruses can help our bodies fight bad bacteria and prevent us from getting sick, but most viruses cause us harm; like the common cold, flu, and warts. Some viruses can even kill us; such as HIV/AIDS, smallpox, and Ebola. viruses are like hijackers. They invade living normal cells and use those cells to multiply and produce more viruses like themselves. Creepy.

[diff between virus and bacteria](#)



Virus attacking and killing a rod-shaped bacteria

GERM EXPERIMENT: WHAT'S ALL AROUND US?

1. Get into groups of 4.
2. Decide what you would like to test for germs (Pick 3 items/areas).
3. Assign jobs: Recorder, Swabber, Labeler, Manager
4. Recorder records, in great detail, which 4 items/areas the group will be testing.
5. Recorder assigns each item/area as either TEST AREA 1, TEST AREA 2, or TEST AREA 3.
6. Manager collects 1 petri dish, 1 plastic bag, 2 pair of gloves, and 4 cotton swabs.
7. Labeler, on the BOTTOM of the petri dish, divides the dish into four equal sections.
8. Labeler labels the sections: TEST AREA 1, TEST AREA 2, TEST AREA 3, and CONTROL
9. Swabber, puts on gloves and, while spinning cotton swab between fingertips to ensure all sides of swab are exposed, swabs all over test area 1.
10. Manager, wearing gloves, opens petri dish and tells swabber on which quarter to squiggle swab.
11. Manager replaces lid on petri dish.
12. Recorder draws picture of swabber's squiggle.
13. Repeat steps 6-10 for next three Test Areas (labeler labels appropriately).
14. Manager, wearing gloves, places petri dish into bag and SEALS it well.
15. Labeler labels bags with group members names.



GERM EXPERIMENTS: RESULTS

By now, you should have Hypotheses, Materials, and Procedures written for both of the germ experiments. For your results, draw pictures, use lots of descriptive phrases, and record your thoughts. Here are a few questions to help you get started:

- Now that you know a little more about bacteria, viruses, fungi and protozoa; what do you think is growing on the bread and in your agar plates?
- If you think you have bacteria growing, what shapes are they? Color? Size?
- Why do you think you have more growth in some places than others?
- Are there different effects between the handwashing and hand sanitizer conditions?

CONSULT EXPERTS

[CDC Expert](#) use this link to write your conclusion for the bread experiment

we spoke to Kelly Reynolds, germ expert and associate professor of environmental health at the University of Arizona, and Jason Tetro, visiting scientist at the University of Guelph and author of the best-selling book *Germ Files*.

First of all, not all hand sanitizers are equal...

"You'll want a hand sanitizer that's 62-70% ethyl alcohol," said Tetro. "You should use enough hand sanitizer so that your hands get wet and it takes about 15 to 20 seconds for them to dry.

or thorough.

"But if you have any visible dirt or grime or sticky stuff on your hands, the sanitizer probably won't remove it," adds Reynolds.

Score one for soap.

Background picture is tongue bacteria