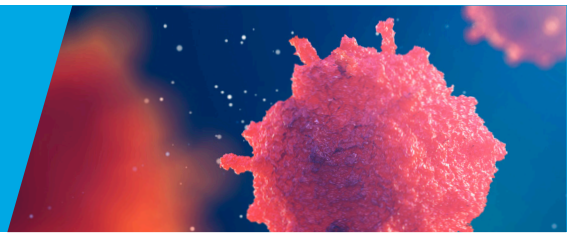
CURIOSITY AT HOME

DON'T BUG ME! (PAGE 1 OF 3)



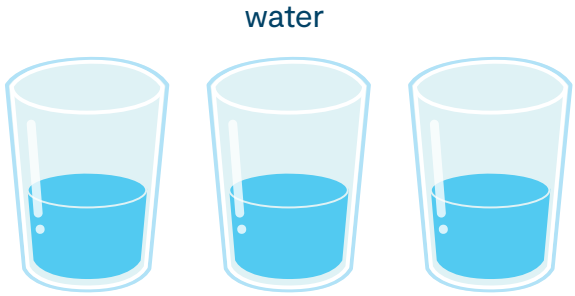
In this investigation, participants find themselves in the middle of a fake flu epidemic. They step into the shoes of an epidemiologist, a doctor who studies the causes, distribution and control of diseases, and try to determine how to prevent the spread of the flu.

***Note:** This activity requires multiple participants, and would be best completed as a family.*

***Main Concepts:** Students learn how easily germs are spread and how to prevent spreading them, use pH paper and learn how it works and practice problem-solving skills as they try to find the source of a simulated flu epidemic.*

MATERIALS

- pH paper—strips or roll (can be obtained from sites such as Edmunds Scientifics at http://www.scientificsonline.com) 1 strip per person
- Paper cups (8 ounce size) 1 cup per participant
- Water to fill cups ⅓ cup measuring cup
- 1 White distilled vinegar 16 ounce bottle
- Pen and paper
- Don't Bug Me Worksheet *(pg 3 of this activity)*



PROCEDURE

- **Parent/Guardian Prep:** Prepare paper cups for the activity and leave them on a table. Fill each cup with ⅓ cup of water but set aside one cup and leave it empty. Fill this empty cup with ⅓ cup of vinegar and no water—this cup will be the source of the "flu" outbreak. Keep the vinegar cup set apart or identify it in a way that the participants will not notice and be sure to note to whom you give it. If you purchased a roll of pH paper, rather than strips, cut the paper into strips about 3" long, one per person.
- Invite participants to share ideas about how flu germs are spread. Make notes (e.g., uncovered coughs and sneezes; shaking hands; touching doorknobs; drinking out of the same cup; touching a surface with germs on it and then touching your nose or mouth).
- Ask participants how long do you think flu germs can stay alive on surfaces such as desks, tables and doorknobs? (Answer: 2–8 hours.)

Experiment continued on next page...

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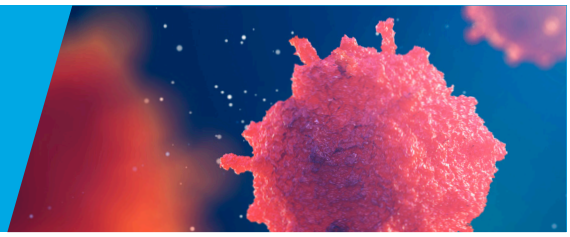
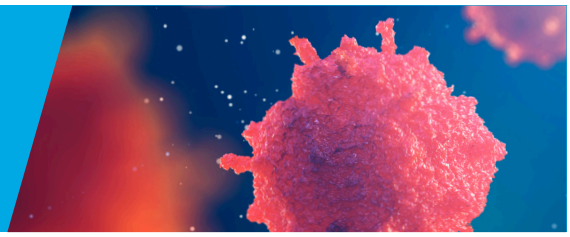


- Explain to participants that they will be doing a "simulation" or acting out of a flu outbreak. Scientists often use simulations as part of experiments as a way to study processes and to see what could happen on a larger scale.
- Participants are going to have two roles in this activity: a student and an epidemiologist. By using the data they collect, they will observe how quickly infectious diseases, like the flu, can be spread.
- Give each participant a copy of the Don't Bug Me Worksheet. During the simulation, participants will fill in the data chart on the worksheet for each person with whom they exchange liquid.
- Invite participants to get a cup of clear liquid. Hand cups to each participant, making sure you remember to whom you gave the cup of vinegar. Tell participants: If for some reason you think you are the source of the infection, please keep that information to yourself.
- Explain that they will now exchange the liquid with each other, recording each interaction on their worksheets. For each exchange, pour all of the liquid from one cup into the other participant's cup and back again, mixing the liquids together, and then pour half back into each cup. This simulates being exposed to flu germs in the environment.
- Once participants have exchanged their cups with all participants, have them set theirs back down.
- Explain how pH paper works: pH paper has been treated with chemicals that turn a certain color in acidic conditions (e.g., vinegar) and another color in basic conditions (e.g., soapy water). The color the paper turns indicates the pH of the liquid. (For this activity, refer to the pH scale that comes with the paper you are using to see the color it will turn in acidic conditions.) pH stands for "potential hydrogen" and is a measurement of how many hydrogen ions are in a liquid. The more hydrogen ions a solution has, the more acidic it is.
- Next, use strips of pH paper to test whether their liquid is acidic. In this simulation, an acidic response means a student is "infected" with the flu virus.
- Pass out one strip of pH paper to each participant and have them hold the strip at one end and dip the other end halfway into their liquid. Have them hold it in the liquid for a count of two, then remove it. Ask them to observe the color on the part of the strip they dipped in the liquid. Did it turn the color indicating "acidic" on your pH paper scale or not? If their strip turned the color that indicates "acidic," they are infected with influenza.
- Ask what they think about the number of students who became infected. Many were infected within just a few minutes. In real life, infections do not spread as quickly as they did in this simulation. Why do infections spread more slowly in real life?
- This simulation showed how a disease would spread if it only required close contact, such as from kissing or sharing eating utensils, to do so. However, some diseases, such as the common cold, can be spread by germs in the air (from an infected person coughing and sneezing) that can be breathed in by a healthy person. Also, the influenza virus can live for hours on surfaces (such as doorknobs and countertops), after being touched by an infected person allowing it to spread to a healthy person who touches a surface and then touches his eyes, nose or mouth.
- Now ask participants to put on their epidemiologist "hats." How did the data they collected help them find the likely source of the infection.
- Once they have narrowed down the likely identity of the first infected person, reveal the true identity of "Patient #1," who was given the cup containing vinegar at the start of the activity. Invite Patient #1 to stand up and then invite the first person they exchanged with in Round #1 to also stand, followed by those who subsequently exchanged liquids with these "infected" in Round #2, and then each subsequent round. This is a good visual way to show the spread of infection.
- Write down everything and everyone they came into contact with that day, from the time they woke up until that minute. "Contact" can include objects that they touched like doorknobs, bus seats, playground equipment and lunch tables, as well as people they touched by sharing food, giving a high five, etc.
- If they really did have the flu, what does their list of contacts tell them about how the disease could be spread at school?



DON'T BUG ME WORKSHEET

Liquid Exchange Data Chart

Round #	Name of Person You Exchanged With	Time of Exchange	Infected (Y/N)
1			
2			
3			
4			
5			

Were you infected? Yes____ No____

How can you personally reduce the spread of the flu, cold or other infectious disease? List at least three ideas:

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