

Germ Warfare 101

Instructions

This is a fun and constructive lesson that can serve all 4-H age groups including adults. It is a great fit with 4-H because it is the ultimate “hands-on” activity. The equipment used in the lesson is also typically part of professional training in medicine, dentistry, food service, and child care.

Background

According to Centers for Disease Control estimates, each year seasonal influenza kills more than 36,000 Americans while some 22 million school days are lost due to infectious diseases such as influenza and the common cold. While most deaths occur among the elderly, an unexpected number of children die from this disease. Children have the highest influenza infection rate, are the major source of infection for the entire population, and show a comparable rate of flu-related hospitalization as the older groups. With the recent emergence of the antibiotic-resistant communicable disease known as *Methicillin-resistant Staphylococcus aureus* or *MRSA*, the Centers for Disease Control, Indiana Department of Health, and physician and health care industry groups all advise that one of the simplest and most reliable forms of health care to prevent these potentially devastating conditions is hand washing. This lesson is intended to positively influence students' hygiene practices, reduce the spread of communicable diseases, and ultimately safeguard community health.

Except for the youngest participants, most students will likely have had a classroom introduction to at least basic biological concepts such as cells and microorganisms like bacteria, viruses, fungi, parasites, and mold. Most microorganisms in nature are harmless and, in fact, many are essential to life. Foods and many medicines are dependent on them. The point of this lesson, however, is to reinforce the importance of hand washing to prevent communicable diseases caused by harmful germs. Winter is usually associated with a higher incidence of communicable conditions such as colds, influenza, strep throat, and pink eye not because of colder temperatures, but rather due to the dual conditions of confined classroom contact and fewer opportunities for outdoor activity. Kids get sick because they don't go outside, not because they do.

A fifth-grade student checks out her hands in Germ Warfare 101, a youth health science lesson.



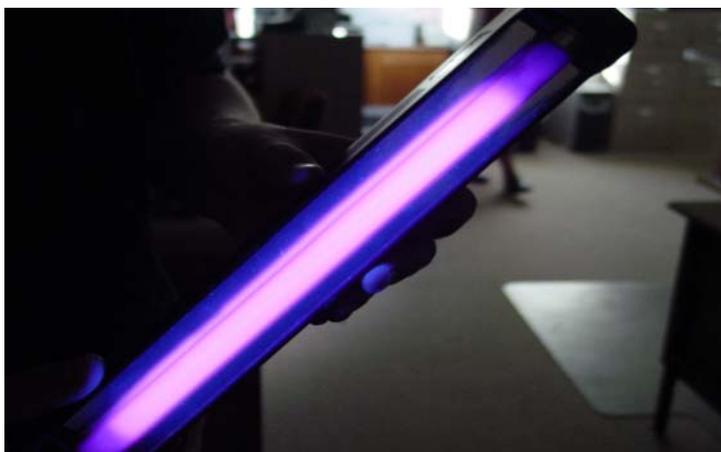
Recommended Equipment & Conditions

Pictured are a common hand washing sink that dispenses both warm and cold water along with a special lotion known as *GlitterBug Potion*[®] which is especially formulated to respond to ultraviolet light, giving a graphic depiction of the existence and spread of bacteria and other microorganisms. Similar products come in aerosol or powder forms. They can be obtained from the *Brevis Corporation* at www.brevis.com (800-383-3377) or *Glo Germ* at www.glogerm.com (800-842-6622). Both products are non-toxic. The 8 ounce bottle shown here costs \$14 and contains 200 applications according to company literature.



If you reduce room lighting and use an ultraviolet light with either direct current or battery power, you will dramatize the visual effect of the *GlitterBug Potion*[®].

Ultraviolet lamps can also be purchased from *Brevis* and *Glogerm*, but should be available less expensively at hobby and specialty lighting stores. A functional and long-lasting UV lamp likely can be obtained for less than \$40. County health departments and some Extension offices may permit 4-H groups to use them as well.



Liquid or foam hand soap and an alcohol-based hand sanitizer such as *germ-X*[®] or *Purell*[®] provide extensions to the lesson so participants can make comparisons. An added benefit of this lesson is not only the health practice it reinforces, but also a simple application of the scientific method: **Observing** and **Comparing** samples. Both are basic to science and discovery and are what scientists do every day.



Equipment & Conditions Recap

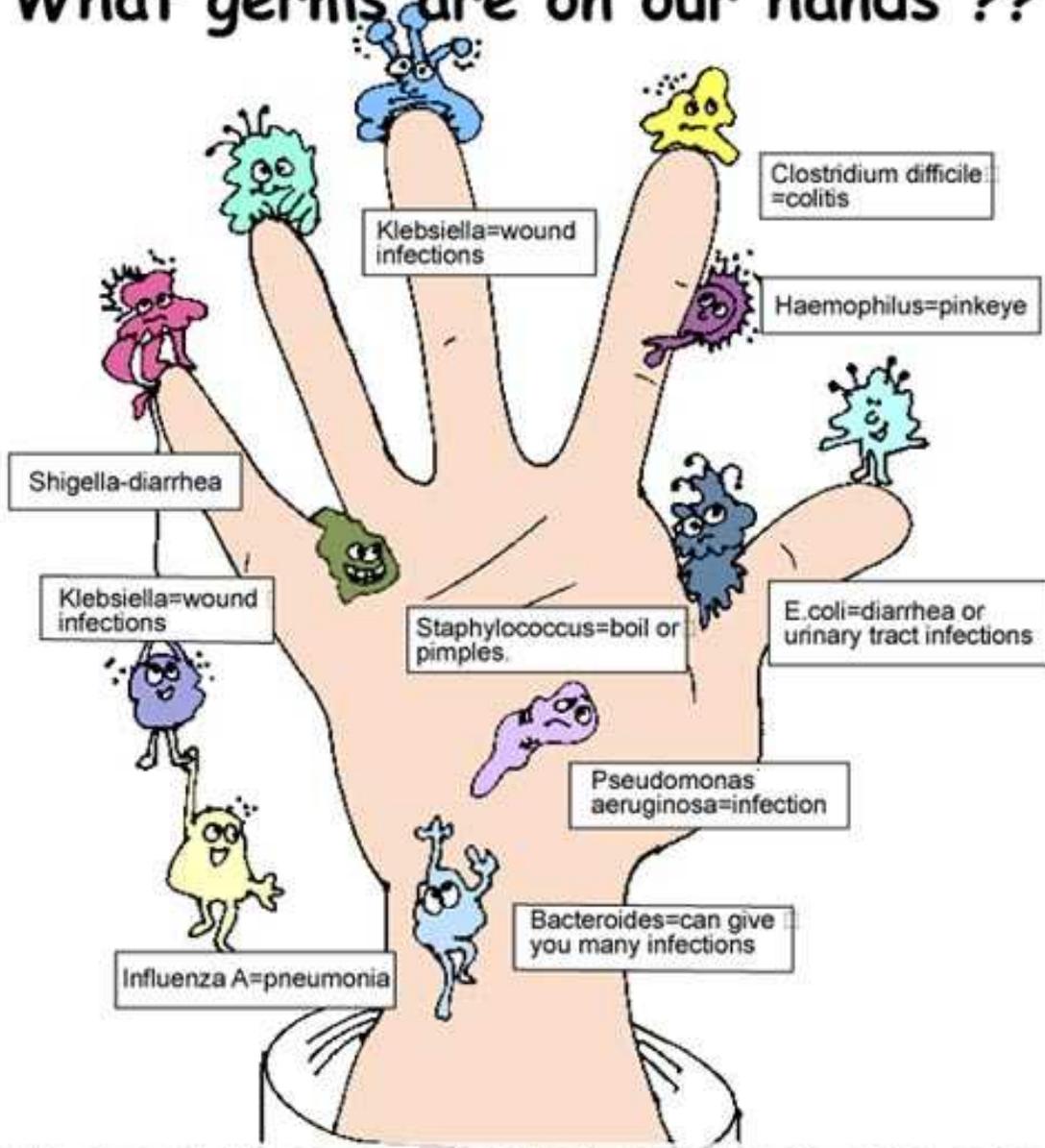
1. Access to a sink that dispenses both warm and cold water.
2. Lotion, oil, or aerosol specially made for this activity. Examples are *Glo Germ*® or *Brevis Glitterbug*® sanitary training products.
3. An ultraviolet light that will simulate the presence and spread of potentially harmful bacteria.
4. Common hand soap and a “waterless” sanitizer such as germ-X® or Purell®.

Lesson Suggestions

The lesson can be conducted with any size of group and can include both youth and adults. It can range in length from a few minutes to an hour depending on size of group, variation in the lesson, and discussion time.

- ▶ Begin by discussing common ways germs are transmitted between people:
 - Coughing or sneezing without covering mouths;
 - Touching contaminated items, then touching others or oneself, especially around the eyes, ears, nose and mouth.
- ▶ Apply an application (one pump) of the glow lotion to each participant’s hands. Have them rub it in thoroughly, especially around knuckles and fingernails. These areas harbor germs in higher concentrations, because they are most often missed during washing. Remind participants that they are not applying actual microorganisms to their hands; the glow lotion is simply a tool to represent germs.
- ▶ Expose the participants’ hands to the ultraviolet light. The effect is striking. Have them rub around their eyes, ears, nose, and mouth, and move the light over their faces. Youth in particular are amused with this part of the activity given the variety of “masks” that will appear!
- ▶ Discuss common objects that would traffic germs between people at home and in the classroom; i.e., telephone, computer keyboard and mouse, remotes, door and faucet handles. Have the students touch such objects in the meeting room if they are available, particularly those that are dark-colored since these colors portray germs most distinctly. Expose those objects to the light and observe.
- ▶ A good way to make comparisons and give the participants an opportunity to draw conclusions is to separate them into groups to determine which method is most effective in removing the glow lotion from their hands. Have one group use cold water only with no soap, have another group use the germ-X, and another use warm water and soap. Have the participants using water wash for twenty seconds. A good way to insure this is to have them count to twenty by thousands, i.e., 1001, 1002, 1003...1020.
- ▶ Have the groups return to the light and compare results. Because they forget that the glow lotion is not actually bacteria-based, youth often think the germ-X or Purell will perform best because these substances reportedly kill 99% of the bacteria. This is rarely the case in this lesson. If participants have washed as instructed, almost always the warm water and soap will establish clear superiority in removing the glow lotion residue, but even then, the ultraviolet light will expose areas around nails and knuckles that were missed. While alcohol-based sanitizers are certainly better than nothing, they are no substitute for warm water and soap in this exercise.

What germs are on our hands ??



Don't spread these germs! Wash your hands after going to the bathroom and before eating!

Handwashing is the single most important thing you can do to stop the spread of infection! This message brought to you by Fairmont General Hospital. Visit our web site at www.fghi.com or www.labs.net/schools/marion/mms/health.htm