Down With Germs

An educational kit to promote handwashing in schools.

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HEALTH UNIT
Public Health

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Handwashing Teaching Kit

This kit is designed to help teachers of students in Grades Junior Kindergarten to Grade 6 teach and reinforce proper handwashing. Some activities may also be appropriate for Grades 7 and 8. Since proper handwashing is the single most effective way to prevent the spread of infection it is important for students of all ages to know when and how to properly wash their hands. The sections of this kit provide simple lesson plans with learning objectives for each grade category. Some learning objectives are similar to those found in the Ministry of Education and Training's curricula for Science and Technology and Health and Physical Education. This kit is designed to supplement the existing information that is taught in classrooms about health and hygiene. Instructions for activities and activity sheets that can be reproduced and used to reinforce handwashing with students are also provided. Teachers are encouraged to select several activities and complete them in class to encourage proper handwashing. Please read "Before Starting: Important Notes on Handwashing" on the next page before beginning your lesson plans.

The information provided in this kit can be used in conjunction with other materials being provided to the schools to create a handwashing awareness campaign in classrooms. Schools will be provided with a germ stamp, green non-toxic inkpad and handwashing posters. Teachers are encouraged to use the stamp with students to reinforce handwashing and draw the attention of students to the posters where applicable. Additional germ stamps are available on loan from the Health Unit along with Glo-germ UV lights and glitterbug potion. Also included is a list of resources that are at the Health Unit on the topic of handwashing and prevention of illness in children. Please feel free to contact the Wellington-Dufferin-Guelph Health Unit about the availability of these resources.

Before Starting: Important Notes on Handwashing

Handwashing does not kill germs.
Proper handwashing using soap and water lifts dirt, oils and microorganisms from the hands and rinses them down the drain. Handwashing reduces the number of microorganisms on the hands and prevents the spread of infection.

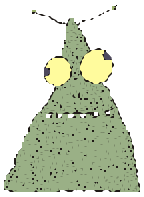
Anti-bacterial soaps are not better than other liquid soaps.
Since it is the lathering action of soap that removes microorganisms from hands, any kind of soap that lathers well will work. Liquid soap in a pump dispenser is better since it cannot become contaminated by people touching the soap and it also lathers better than bar soap. Beware of overusing anti-bacterial products as this has been linked to the increase in antibiotic resistance in some individuals.

Drying hands well is just as important as washing properly.
Drying hands well will help prevent dried, cracked skin where microorganisms can hide. Water left on hands after washing will draw natural moisture out of skin as it evaporates. To prevent dry skin, after drying well with a towel, a moisturizing lotion can be used on hands. Store lotion in a pump to prevent possible contamination and apply it each time after handwashing.

Hand sanitizers or gels are not a substitute for proper handwashing.
Hand sanitizers or gels usually contain high amounts of alcohol designed to kill microorganisms. Dirt or oil that may normally be on hands will reduce the effectiveness of the sanitizer since they interfere with the action of alcohol. Hand sanitizers work best on already clean hands to kill any organisms that were not removed by handwashing. They may also be used on a temporary basis when no water is available for handwashing such as when on an outdoor field trip, although teachers and students should be encouraged to properly wash their hands at the first opportunity to use a sink. Hand sanitizers can also be very drying to skin, so use moisturizing lotion when possible. For the most effective sanitizers, look for brands that are at least 60% alcohol, the higher the alcohol content the better.

Junior Kindergarten to Grade 2 Lesson Plan

Learning Objectives



- ☑ Understand that proper handwashing is important and can prevent children from becoming sick.
- ☑ Practise appropriate personal hygiene.
- ☑ Identify substances, such as germs, that are harmful to the body.
- ☑ Describe how germs are transmitted and how it relates to personal hygiene.

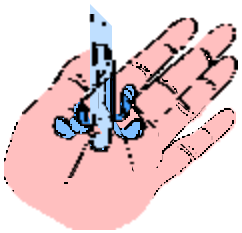
General Information

- ☺ Germs can be everywhere.
- ☺ Germs are so small you cannot see them.
- ☺ Germs get on your hands from things that you touch.
- ☺ Germs can get inside you through your mouth, nose and eyes.
- ☺ Some germs can make you sick.
- ☺ You can get rid of most germs by washing your hands.
- ☺ Washing your hands will keep you from getting sick.

How to Wash Your Hands

1. Wet hands with warm water.
2. Use soap. It's best to use liquid soap.
3. Lather for at least 15 seconds.
4. Remember to rub palms together, scrub the back of hands, between the finger and under the fingernails.
5. Rinse well with water to remove all lather.
6. Dry hands well using a paper towel.

Lathering with soap helps to lift dirt and germs off hands so they can be rinsed down the drain. However, if there is no soap, going through the action of handwashing will still help to remove some germs from your hands.



When to Wash Your Hands

- ☺ Before eating, drinking or touching food.
- ☺ After going to the bathroom.
- ☺ After playing outside or with animals.
- ☺ After visiting someone who is sick.
- ☺ If hands look or feel dirty.

Activities and Activity Sheets

Select several activities or activity sheets from the following pages to reinforce proper handwashing.

A germ stamp and green non-toxic inkpad is also available at each school. Use the stamp with students as a reward for participating in each activity as well as a reminder to wash their hands as often as possible. The germ stamp can also be used in an activity where students are challenged to wash the germ stamp off by thorough and proper handwashing.

Activity #1: Use Glo-Germ

Description:
Demonstrates to students that germs can be on their on their hands although they cannot be seen. Helps students to understand that handwashing can remove germs from hands.

Materials Needed:

- Glo-germ UV light (available from the Health Unit)
- Glitterbug Potion (available from Health Unit)
  NOTE: A Material Safety Data Sheet for Glitterbug Potion is included in the Websites and News Articles for Teachers section at the end of the Kit.
- A sink with hot and cold running water
- Liquid soap
- Paper towels

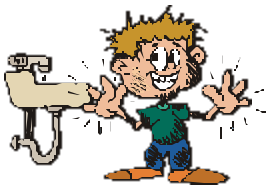
Method:

1. Place a small amount of Glitterbug Potion into each student's hand. A pea sized drop should be enough for small hands.
2. Have students rub the potion all over their hands
3. Explain that like the potion, germs are on their hands although they cannot see them.
4. Have children place hands under the UV light (you may have to dim the lights in the room). The areas where there is Glitterbug Potion will glow purple under the light.
5. Explain to students that the purple glow shows where germs are on their hands.
6. Have children wash hands using the proper technique and then look at their hands under the UV light again. There should be a significant reduction in the areas that glow purple.

7. Have students discuss areas that are commonly missed during handwashing, where the Glitterbug Potion continued to glow under the light. These are usually the thumbs, between the fingers and underneath the fingernails. Encourage students to pay extra attention to these areas whenever handwashing.
8. Explain that like germs, the potion can be washed off through proper handwashing.

Variations:

- Divide children into two groups. Have one group wash with water only, and the second group wash with soap and water. After examining their hands under the Glo-germ light, discuss how much cleaner hands washed with soap and water become.



Activity #2: Sing and Wash ♫ ♫ ♫

Description:
Use songs or chants to teach students how long to wash their hands. Proper handwashing should last for a minimum of 15 seconds.

Materials Needed:
- One of the songs or chants included below
- A sink with hot and cold running water
- Liquid soap
- Paper towels

Method:
1. Review the steps of proper handwashing with students.
2. Demonstrate how to lather by rubbing palms together, rubbing the back of hands, between the fingers and washing the thumb.
3. Have students sing or chant a song to a favourite tune while pretending that they are lathering by rubbing their hands together.
4. Have children actually wash their hands using the proper technique while singing or chanting the song.

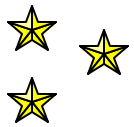
Song #1
We wash our hands to keep them clean…
The cleanest hands you've ever seen!
Use soap and water – that's the way
To chase those yucky germs away!

Song #2
Soap and water, that's the way,
You can wash the germs away.
Keep on washing – when you do,
You'll get rid of germs, it's true.
Now your hands are clean, here's why:
Germs are down the drain. Goodbye!

Song #3 (Try this song to the tune of "Farmer in the Dell".)
Turn the faucet on; make sure the water's warm.
Put the soap on your hands, and make a soapy stom.
Scrub-a-dub each hand, each finger, thumb, and wrist.
Scrub-a-dub all over, so not a spot is missed.

Variations:

- Some other common songs last for about 15 seconds are:
    - The Alphabet Song
    - Row, Row, Row Your Boat
    - Twinkle, Twinkle Little Star



Activity 3: Covering Your Sneeze

Description:
Children learn that covering a sneeze with a tissue helps keep germs from getting on hands and prevents the spread of germs.

Materials Needed:

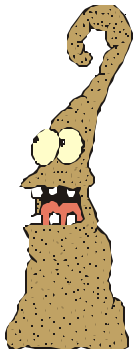
- Construction paper
- Scissors
- Glue
- Facial Tissue

Method:

1. Explain to the class that they will be creating a portrait of themselves covering a sneeze.
2. Have students cut an oval from a sheet of construction paper the size of a face and glue it onto another blank sheet of construction paper.
3. Tell students to draw their face on the oval.
4. Have children trace one of their hands on a sheet of paper and glue the bottom of the hand onto the chin of the drawn face. Make sure the fingers of the hand still lift up.
5. Have students slide a piece of tissue between the face and the unglued part of the hand, covering the face and mouth.
6. Discuss with students why it in important to cover a sneeze and that even when a tissue is used, they should wash their hands after sneezing. If tissues are not available, they can cough or sneeze into an elbow or shoulder to keep germs from getting on hands.

Grades 3 and 4 Lesson Plan

Learning Objectives

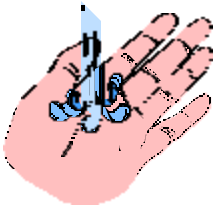


- ☑ Describe how germs are transmitted and how it relates to personal hygiene.
- ☑ Understand that there are many types of germs (bacteria and viruses, as well as good and bad).
- ☑ Identify some of the illnesses and diseases that bad germs can cause.
- ☑ Understand that proper handwashing removes bad germs from hands and prevents the spread of illness and disease.

General Information

- ☺ Germs are so small that you cannot see them and they can be found almost everywhere.
- ☺ There are many types of germs, including bacteria and viruses.
- ☺ Some bacteria and viruses cause illness and disease. Some are naturally occurring and do not make people sick but may actually be beneficial to people. Examples of beneficial bacteria are ones used to make yoghurt and cheese. People also have beneficial *E. coli* bacteria in their intestines or guts that help them digest food.
- ☺ Some illnesses and diseases that are caused by bacteria and viruses can be very serious.
- ☺ Some examples of illnesses and diseases caused by bacteria and viruses are: colds, influenza or the “flu”, chicken pox, hepatitis and salmonellosis (food poisoning caused by *Salmonella* bacteria).
- ☺ Washing with soap and water removes germs from your hands and washes them down the drain. Handwashing does not kill germs, it just reduces the number of germs on your hands.
- ☺ Washing your hands properly and often can prevent the spread of many illnesses and diseases.

How to Wash Your Hands



1. Wet hands with warm water.
2. Use soap. It's best to use liquid soap.
3. Lather for at least 15 seconds.
4. Scrub the back of hands, the thumb, between the fingers and under the fingernails.
5. Rinse with water to remove all lather.
6. Dry hands well using a paper towel.

Lathering with soap helps to lift dirt and germs off hands so they can be rinsed down the drain. However, if there is no soap, going through the action of handwashing will still help to remove some germs from your hands.

When to Wash Your Hands

- ☺ Before eating, drinking or touching food
- ☺ After going to the bathroom
- ☺ After playing outside or with animals
- ☺ After visiting someone who is sick
- ☺ After touching money
- ☺ After coughing, sneezing or blowing your nose
- ☺ If hands look or feel dirty.

Activities

Select several activities or activity sheet from the following pages to reinforce proper handwashing.

A germ stamp and green non-toxic inkpad is also available at each school. Use the stamp with students as a reward for participating in each activity as well as a reminder to wash their hands as often as possible. The germ stamp can also be used in an activity where students are challenged to wash the germ stamp off by thorough and proper handwashing.

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- A sink with hot and cold running water
- Liquid soap
- Paper towels

Method:

1. Place a small amount of Glitterbug Potion into each student's hand. A pea sized drop should be enough for small hands.
2. Have students rub the potion all over their hands
3. Explain that like the potion, germs are on their hands although they cannot see them.
4. Have children place hands under the UV light (you may have to dim the lights in the room). The areas where there is Glitterbug Potion will glow purple under the light.
5. Explain to students that the purple glow shows where germs are on their hands.
6. Have children wash hands using the proper technique and then look at their hands under the UV light again. There should be a significant reduction in the areas that glow purple.

7. Have students discuss areas that are commonly missed during handwashing, where the Glitterbug Potion continued to glow under the light. These are usually the thumbs, between the fingers and underneath the fingernails. Encourage students to pay extra attention to these areas whenever handwashing.
8. Explain that like germs, the potion can be washed off through using proper handwashing.

Variations with Glo-germ:

- Divide students into two groups. Put Glitterbug Potion on the hands of all students. Have one group wash with water only, and the second group wash with soap and water. Discuss how much cleaner hands washed with soap and water become.

- Divide students into three groups. Put Glitterbug Potion onto the hands of all students. Have the first group wash hands and lather for 5 seconds. Have the second group lather for 15 seconds and the third group lather for 30 seconds. Compare the cleanliness of the hands of each group. Discuss how lathering for a longer period of time will make hands cleaner.
- Put Glitterbug Potion onto the hands of one student and ask that student to shake hands with five classmates. Examine the hands of the students involved in the handshakes under the UV light and discuss how the Glitterbug Potion has been transferred from the hands of the original student to the other's hands. This is a representative of how germs can be transmitted from one person to another through direct contact.
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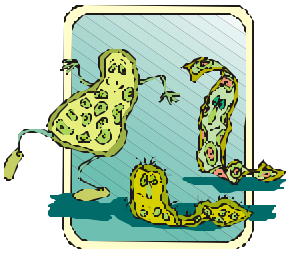
Activity 2: Creating Your Own Germs

Description:
Students learn about different types of bacteria, their shapes and are able to use modeling clay to create their own bacteria.

Materials Needed:

- Chart with bacteria shapes and description (provided)
- 2 cups flour (500ml)
- 1 cup salt (250ml)
- 1 tablespoon oil (15ml)
- 1 cup hot water (250ml)
- Food colour, powdered or liquid paint

Method:



1. Show students the chart with the magnified germs and what illnesses or diseases are transmitted by each type of germ.
2. Tell students that all the germs on the chart are actually called bacteria. Bacteria and viruses are the most common germs that cause illness and disease.
3. Have students mix modeling compound from the ingredients listed above and create their own bacteria shapes based on those from the chart.
4. Discuss how bacteria, although they are so small they cannot be seen, can be all over hands and under the fingernails just like the modelling clay.
5. Have students demonstrate proper handwashing technique when washing off the modelling clay.

Variations:

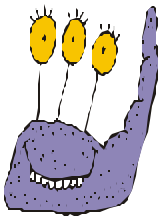
- Find magnified pictures of viruses and discuss common illnesses that can be caused by viruses. Also discuss the concept of beneficial bacteria and viruses that do not make people sick, like bacteria used to make yoghurt and cheese. Have students make models of the different types of organisms.

Magnified Bacteria and What They Do!

Name of Bacteria	What it Looks Like!	Where it is Found!	What it Does!
Escherichia coli		In the stomachs of animals, especially cattle, and humans.	Commonly causes diarrhea, vomiting and stomach cramps. Can have serious complications.
Staphylococcus aureus		On human skin, in nose and throats.	Commonly causes skin and wound infections. Also causes pimples.
Salmonella enteritidis		In the stomachs or animals, especially chickens and humans.	Causes diarrhea and vomiting. One of the most common causes of food poisoning.
Streptococcus pyogenes		In the throats and nose of humans.	Very common cause of sore throats. Can also cause skin infections.

Grade 5 and 6 Lesson Plan
(May also be applicable for Grades 7 and 8.)

Learning Objectives



- ☑ Understand the difference between various types of microorganisms such as viruses and bacteria.
- ☑ Know the different ways, or routes of transmission, that illness and disease can be spread.
- ☑ Identify and discuss common childhood illness and disease and methods of prevention.
- ☑ Describe components of the body's system of defence against infections.

General Information

- ☺ Germs are so small that you cannot see them and they can be found almost everywhere. They are also called microorganisms, which means that they are to small to be seen without the help of a microscope.
- ☺ There are many types of microorganisms, including bacteria and viruses.
- ☺ Some bacteria and viruses cause illness and disease. Some are naturally occurring, do not make people sick and may actually be beneficial to people. Examples of beneficial bacteria are ones used to make yoghurt and cheese. People also have beneficial *E. coli* bacteria in their gastrointestinal tracts that help them digest food.
- ☺ Microorganisms that cause illness and disease are referred to as pathogenic.
- ☺ Some illnesses and diseases that are caused by bacteria and viruses can be very serious or have serious complications.
- ☺ Some examples of illnesses and diseases caused by bacteria and viruses are: upper and lower respiratory tract infections, influenza, hepatitis A and B, HIV/AIDS and Salmonellosis (food poisoning caused by *Salmonella* bacteria).

- ☺ Microorganisms can be spread 4 ways, called routes of transmission. These are:
  - o fecal-oral or hand to mouth contact (i.e. *Salmonella*, Hepatitis A)
  - o directly or through close contact by sharing personal items (i.e. lice)
  - o blood contact (i.e. HIV/AIDS, Hepatitis B)
  - o respiratory or airborne contact (i.e. influenza and colds)
- ☺ Washing with soap and water removes microorganisms from your hands and washes them down the drain. Handwashing does not kill microorganisms, it just reduces the number of microorganisms that are on your hands. Reducing the number of organisms on your hands makes it less likely for them to cause an infection or be spread to others.
- ☺ Washing your hands properly and often can prevent the spread of many illnesses and diseases.

How to Wash Your Hands

1. Wet hands with warm water.
2. Use soap. It's best to use liquid soap.
3. Lather for at least 15 seconds.
4. Remember to scrub the back of hands, the thumb, between the fingers and under the fingernails.
5. Rinse with water to remove all lather.
6. Dry hands well using a paper towel.

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When to Wash Your Hands

- ☺ Before eating, drinking or preparing food.
- ☺ After going to the bathroom.
- ☺ After playing outside or with animals.

- ☺ After visiting someone who is sick.
- ☺ After touching money.
- ☺ After coughing, sneezing or blowing your nose.
- ☺ If hands look or feel dirty.

Activities

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- A sink with hot and cold running water
- Liquid soap
- Paper towels

Method:

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fingernails. Encourage students to pay extra attention to these areas whenever handwashing.

8. Explain that like germs, the potion can be washed off through proper handwashing.

Variations with Glo-germ:

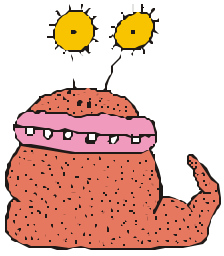
- Divide children into two groups. Have one group wash with water only, and the second group wash with soap and water. Discuss how much cleaner hands washed with soap and water become.
- Divide students into three groups. Put Glitterbug Potion onto the hands of all students. Have the first group wash hands and lather for 5 seconds. Have the second group lather for 15 seconds and the third group lather for 30 seconds. Compare the cleanliness of the hands of each group. Discuss how lathering for a longer period of time will make hands cleaner.
- Put Glitterbug Potion onto the hands of one student and ask that student to shake hands with five classmates. Examine the hands of the students involved in the handshakes under the UV light and discuss how the Glitterbug Potion has been transferred from the hands of the original student to the other's hands. This is a representative of how microorganisms can be transmitted from one person to another through direct contact. Discuss other routes of transmission and have students give examples of everyday activities that could transmit microorganisms.

Activity 2: Growing Microorganisms

Description:
Students learn that microorganisms can be everywhere by making cultures on agar plates. Cultures of washed and unwashed hands are compared to show that microorganisms are everywhere and that handwashing reduces the number of bacteria on hands.

Materials Needed:

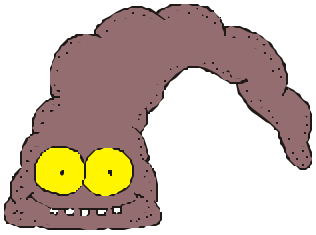
- Petri dishes with nutrient agar (Get these from a science teacher, university, hospital or from the Health Unit.)
- Masking and Scotch Tape
- A marker
- Cotton swabs
- A sink with hot and cold running water
- Liquid soap
- Paper towels



Method:

1. Explain to students that the petri dishes will help grow bacteria so that they can be seen without the use of a microscope.
2. Have students inoculate petri dishes with a different bacterial source for each plate. Suggestions are:
    - **Hair** – remove hair from the head of a student and place into the dish.
    - **Cough** – hold a petri dish 6 cm (about 3 inches) away from the mouth of a student and have him/her cough onto the plate.
    - **Saliva** – place a clean cotton swab into a mouth and moisten it with saliva, rub the swab over the agar.
    - **Nose** – place a clean cotton swab into a nose and gently move it around, rub the swab over the agar.
    - **Counter** – have a student drag his/her fingers on a counter top then trace and “S” on the agar.

3. Have a student who has not washed his/her hands place fingertips in the agar.
4. Have a student wash hands properly and place fingertips in the agar of a different dish.
5. Label the bottom of each dish using the masking tape and marker.
6. Tape each dish closed by running scotch tape around the edge.
7. Place the dish in a warm dark place for three to five days. Check the dishes daily for growth, when the desired amount of bacteria growth is seen, refrigerate.
8. When bacterial growth can be seen, have students examine dishes and discuss how the bacteria were present although it could not be seen.



9. Review the types of bacteria and viruses that can be found in the areas used for inoculating the dishes and the different routes of transmission that occurred when inoculating the petri dishes.
10. Compare the dishes that contained the washed and unwashed hands. Explain how handwashing reduces the amount of bacteria on hands.
11. Arrange to return used petri dishes to where they were from for proper disposal.

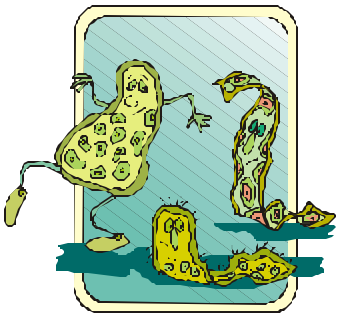
Activity 3: Good Guys/Bad Guys

Method:

1. Divide students into groups.
2. Have each group pick a bacteria or virus and find out where it is found, what illness or disease it causes and how it is transmitted.
3. Have groups present their bacteria to the rest of the class and give suggestions on how to prevent becoming ill from their microorganism.
4. Have at least one group select a beneficial bacterium and discuss different types of beneficial bacteria after presentations are complete.

Activity 4: The Art of Bacteria

Method:



1. Have students find pictures of magnified bacteria and viruses through research.
2. Have students draw their own pictures of bacteria or viruses as they may be seen under the microscope. Label pictures with the scientific name.
3. Use pictures to discuss the difference between bacteria and viruses and the illnesses or diseases that they cause.

Activity 5: The Story of Bacteria

Method:

1. Have students write an adventure story from the point of view of the bacteria, including efforts to stay on hands during handwashing.
2. Discuss with students how the action of handwashing lifts microorganisms off hands and washes them down the drain.

Resources Available at the Health Unit

Resource	Target Age Group
Glo-germ Light – handwashing demonstration tool **The Glo-germ light, a supply of Glitterbug Potion and a germ stamp can be couriered to your school upon request. Schools are responsible for return courier of these resources. Please contact the following for more information or to book this resource:** **Guelph Office: Isabel Bellamy 821-2370** **Fergus Office: Trudy Goodall 843-2460** **Orangeville Office: Cheryl Arthur 941-0760**	All ages
Handwashing Puppet Show	JK to 3
Those Mean Nasty Dirty Downright Disgusting but Invisible Germs Book	JK to 3
The Ten Potatoes: A Counting Book about Handwashing	JK to 3
Buddy Bear's Handwashing Troubles Book	K to 3
Sudsy Says Just Wash Them Teaching Kit	1 to 3
Germs Make Me Sick Book	1 to 4
The Germ Gang and Annie Antibody Activity Book and Music Tape	2 to 6

All resources other than the Glo-germ light are available for loan from the Guelph Office of the Wellington-Dufferin-Guelph Health Unit. Please contact Manisa Jiaravuthisan at 821-2370 ext.348 for availability.

Websites and News Articles for Teachers

www.4children.org: Action Alliance for Children.

www.accessexcellence.org: Microbiology Professor at Skyline College, U.S.A.

www.aes.purdue.edu: Purdue University, U.S.A.

www.apic.org: American Practitioners in Infection Control.

www.asmusa.org: American Society for Microbiology.

www.fightbac.org: The Partnership for Food Safety Education.

www.foodsafety.gov: FDA Centre for Food Safety and Applied Nutrition.

www.gsu.edu/~wwwche/elessons.htm: Georgia State University, U.S.A.

www.healthyhands.com: GOJO Industries.

www.microbe.org/washup/Wash_Up.asp: American Society for Microbiology.

www.mmhschool.com: McGraw-Hill Publications.

www.safeeats.com: Northern Virginia Alliance for Food Safety.

www.vm.cfsan.fda.gov/~cjm/millprt.html: National Science Teachers Association, Food and Drug Administration.

References

Cooke, Marjorie T. (1986), Germbusters, Utah: Brevis Corporation.

Handwashing Awareness Week Classroom Kit (1995), The Canadian Paediatric Society in association with Lever 2000.

Handwashing Lesson Plans (2000), Utah Hygiene Education Coalition.

The Kindergarten Curriculum (1998), Toronto: Ontario Ministry of Education and Training.

The Ontario Curriculum Grades 1-8: Science and Technology (1998), Toronto: Ontario Ministry of Education and Training.

The Ontario Curriculum Grades 1-8: Health and Physical Science (1998). Toronto: Ontario Ministry of Education and Training.

www.aes.purdue.edu/acs/safe/act2.html (1996), Safe Food for the Hungry.

www.healthyhands.com/teacher/step2/curriculum_upper_grades.asp (1999).

www.healthyhands.com/teaher/step2/curriculum_pre.asp (1999).

www.microbe.org/washup/Wash_Up.asp (1999), American Society of Microbiology.