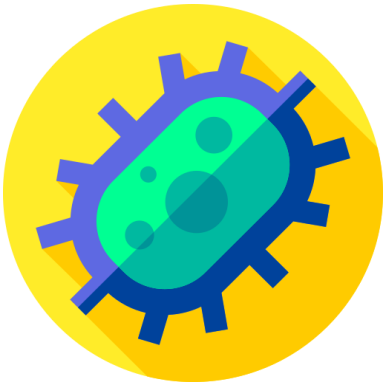
# Bacteria and Handwashing

## Lesson Plan for Students in Grades 4 to 6



2021

DO BUGS NEED DRUGS?

antibiotic wise.ca

# Overview

This lesson plan is for teachers, public health nurses, or health care students to use in an intermediate level classroom. The lesson starts with an introduction, done as an interactive discussion with the students. The second part of the lesson is learning and practicing the six steps of proper handwashing. There is an optional activity for intermediate students to teach primary students how to wash their hands. The lesson plan can be adapted to fit your needs and the needs of the classroom. This lesson plan is designed to be approximately 40-50 minutes in length.

We can provide teaching kits to colleges, universities, or schools free of charge. We ask that the kits be used over multiple years, and that you restock or replace the kit contents as needed. We also ask that you report your teaching back to us as the number of students taught in BC is reported to the Ministry of Health.

Please report teaching by visiting: **antibioticwise.ca/report-teaching**

# Materials included in the teaching kit

- UV light
- Glo Germ lotion
- Print materials for students to bring home
- Stickers and posters for classroom display

# Learning Outcomes

- Following this lesson, students will be able to:
  - Describe key differences between bacteria and viruses.
  - Discuss the importance of effective handwashing on the health of self and others.
  - Recognize the benefits of persevering good bacteria
  - Demonstrate effective handwashing.

# How the lesson aligns with the BC Curriculum

**Science**

- Caring for self, family, classroom, and school

**Physical & Health Education**

- Healthy Living
- Social & Community Health

**Career Education**

- Leadership Skills
- Project Management Skills
- Community Contribution

For more lesson plans and teaching resources, visit **antibioticwise.ca/teaching**

# Activity 1: Introduction to Bacteria and Viruses

**Length:** 15 minutes

**Materials:** Whiteboard and marker to write responses down (optional)

Have the students sit at desks to introduce the material. Begin by introducing yourself and use the guide below to engage the students in the material. You can adapt as needed to suit your needs and the needs of the classroom.

- Introduce yourself as a guest teacher. Include a few sentences on why you think it is important to teach about healthy living.
- Use questions and answer technique to engage students and guide them through introduction. Help to summarize the answers students provide with the responses provided below under *answers you are looking for.*

**Possible questions for interactive teaching during introduction:**

**1 Who can tell us what causes people to get sick?**

*Answers you are looking for:*

Germs cause people to get sick. Sometimes you hear the word germs or bugs, but the scientific names for what makes you sick are bacteria or viruses.

**2 Who knows what bacteria and viruses are?**

*Answers you are looking for:*

Bacteria and viruses are very small organisms that can only be seen with a microscope.

**3 Where can we find bacteria and viruses?**

*Answers you are looking for:*

Everywhere.

**4 If bacteria and viruses are everywhere, why don't we get sick all the time?**

*Answers you are looking for:*

- Not all bacteria and viruses make us sick.
- Most bacteria are good for us.
- Our skin, and immune system protect us.
- Immunizations protect us from vaccine preventable diseases.
- We wash our hands.
- Healthy eating, sleep, and exercise help keep us healthy.

*Continued >>*

**Possible questions for interactive teaching during introduction (continued):**

**5** **What do you know about bacteria and viruses? Are they pretty much the same thing? (You can show the picture of bacteria and viruses from page 8 to see what differences the students notice)**

*Answers you are looking for:*
Bacteria are the rounded shapes and viruses are angular. Even though bacteria and viruses are both microscopic, they are very different from each other. Bacteria are larger and more complicated than viruses. Bacteria can replicate (create more copies of themselves) on their own and are more complex. Viruses can't make copies of themselves without the help of a host cell. Viruses need to go into another cell to reproduce.

**6** **Are all bacteria bad for you?**

*Answers you are looking for:*
Most bacteria are good for you – they are important for digestion of food, and the beneficial bacteria in your body and on the surface of your skin crowd out the disease causing bacteria. Bacteria are also important for the earth. In one teaspoon of soil there are about 100 million to 1 billion bacteria! The bacteria in soil are very beneficial to the earth; they help break down dead organisms and turn it into soil, and they also form partnerships with plants to help plants survive. Bacteria are also needed in the ocean for marine plants and animals. Bacteria have been on earth longer than humans and they make up more of earth's biomass than humans. ***How many of you have changed your mind about bacteria?***

**7** **Who knows what antibiotics are?**

*Answers you are looking for:*
An antibiotic is a medicine prescribed by a doctor or nurse practitioner to treat a bacterial infection that our body is unable to fight off on its own. Antibiotics are medicine that kill bacteria. They do not work against viruses.

*Continued >>*

**Optional Video "Antibiotic Resistance and the Rise of Superbugs" (7:23 mins)**

youtu.be/fyRyZ1zKtyA (watch until about 4:55)

**Optional Video "What Causes Antibiotic Resistance?" (4:34 mins)**

youtu.be/znnp-Ivj2ek

**Possible questions for interactive teaching during introduction (continued):**

**8** **Did you know that colds and flus are caused by viruses? Do you think antibiotics are needed for colds and flus?**

*Answers you are looking for:*
No, antibiotics kill bacteria, not viruses, and seasonal colds/flus are caused by viruses.

**9** **Should we take antibiotics whenever we're sick, just in case the illness is caused by bacteria?**

*Answers you are looking for:*
Every time we take antibiotics, the bacteria learn how to become stronger. They can adapt to learn how to live with stronger antibiotics until the antibiotic no longer works. That is called resistance.

When bacteria have resistance, the antibiotic doesn't work anymore as the bacteria have found a way to live even in the presence of an antibiotic. In our world today we are seeing more resistant bacteria. We need to make sure we only take antibiotics when they are needed so that bacteria don't become resistant. Also, when you take antibiotics, they kill all of your good bacteria as well as the harmful bacteria so you can have problems with digestion while taking antibiotics. You should only take antibiotics when a doctor or nurse practitioner advised you to. This helps to make sure we are using antibiotics in the correct why and it also helps to protect the good bacteria in our body.

**10** **Are antibacterial ingredients (containing antibiotic chemicals) needed in soaps – should we have additives that kill bacteria in our soap?**

*Answers you are looking for:*
No, most bacteria are good for us, and antibacterial soaps kill the good bacteria and the harmful bacteria. Plain soap does a good job of getting rid of the harmful bacteria and it won't kill the good bacteria. Plain soap lifts off the harmful bacteria and dirt and grease, and leaves the good bacteria on your hands. Therefore, plain soap is the preferred method of handwashing.

**11** **Who knows the one thing we can do that will help us prevent spreading germs and infections and also keeps us healthy?**

*Answers you are looking for:*
Wash your hands!

# Activity 2: Handwashing

**Length:** 20-25 minutes

**Materials:** UV light, Glo Germ lotion, access to a sink with soap and paper towel, computer for optional video

- Explain that you have a bottle of pretend bacteria and viruses. "*It is just like hand lotion, and there is nothing harmful in it, but the lotion glows under a special light*." Demonstrate putting a pea-sized amount of Glo Germ lotion on your hands and rub it in. Dim the overhead lights. **Demonstrate how your hands glow when you shine the UV flashlight on them, showing the pretend germs**. While the lotion is still 'wet' on your hands, show spreading the "germs" by touching objects in the room (borrow a pen from a student to write a note on your paper, touch doorknob, whiteboard eraser, or give a student a high-five).

- **Explain that using your hands to touch other things transfers the bacteria and viruses to different places**. Walk around the room to places you've touched and use UV light to show that germs traveled to students' hands, pens, and paper.

- Review that **handwashing is the best way to prevent the spread of bacteria and viruses and stay healthy**.

### Optional Video "Wash Your Hands" (2:23 mins)

youtu.be/yJEh2fPzfVE (watch until 1:05)

- **Review handwashing technique with students** – students follow along pretending to wash hands in water while seated in their desks. Show the six steps as they follow along.

1. **Wet your hands: Pretend to put hands under the tap.**
2. **Apply soap : Pretend to get 1-2 squirts of plain soap from the dispenser to get hands soapy.**
3. **Rub hands together for 20 seconds: Talk aloud while children pretend to rub hands together (getting all areas of the hands, the back of hands, between fingers, nails, thumbs, wrists).**
4. **Rinse hands for 10 seconds: Pretend to rinse hands under tap.**
5. **Dry your hands with a paper towel.**
   Note: Paper towels are an important part of handwashing as they remove germs too! Towels are ok in the home, but paper towels are best in public areas like at school. Dryers that leave hands moist encourage more bacteria growth, and wet hands pick up more bacteria from surfaces.
6. **Use paper towel to turn off tap.**

# Activity 2: Handwashing continued

- **Have students pair up in groups of two at their desks**. Hand out T/F worksheets for students to complete (print a handout for each student and one for yourself for reference from **page 9**).

- **Take four students to sink to do the handwashing activity while other students are working on T/F activity**. Put a pea-sized amount of lotion on hands and students rub it in all over hands (palms, back of hands, between fingers, on thumbs).

- **Shine UV flashlight on hands to see hands glow with pretend germs** (have classroom lights dimmed if possible).

- One at a time, **students wash and dry hands using the six steps they have learned**.

- **Dry hands and then use UV light to look at hands** – notice any areas that need more attention with future handwashing.

- **Once all students have washed their hands, have students at desks get ready for reviewing T/F**. Hand out one green card and one red card to each group of two (print out enough cards so each student has one red card and one green card from **page 11** or cut up green and red construction paper). Students hold up green card if they think answer is true, red for false. Read each question aloud and have students hold up a card for their answer.

- **Review the correct answer for each question**. Discuss any answers that were surprising. Discuss handwashing and which areas need to be more thoroughly washed after seeing the UV residue that didn't come off. Discuss the goal of washing well enough each time that the UV light wouldn't show any areas glowing.

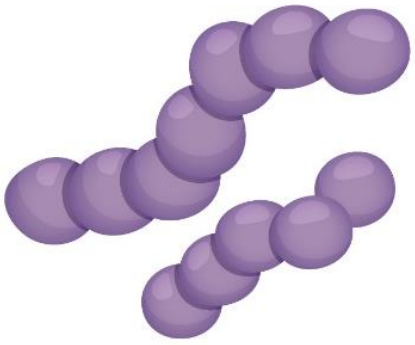
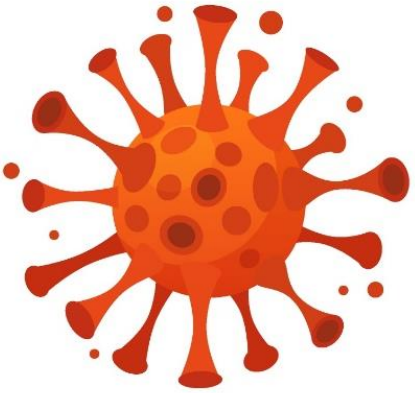
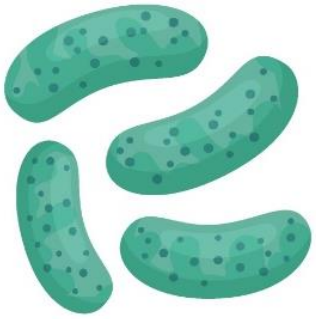
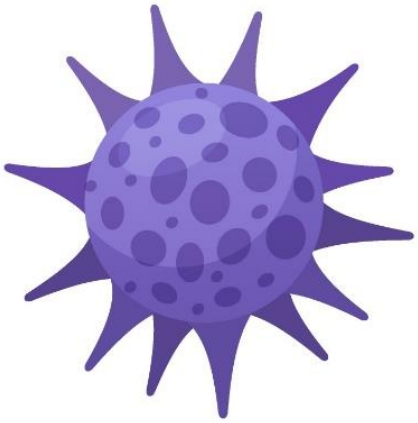
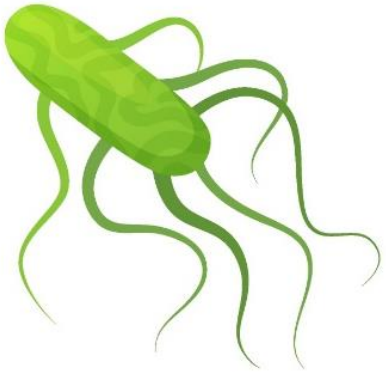
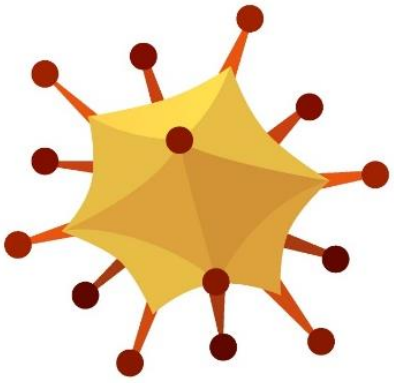
# Summary

Review the main points from the session with the students:

- Bacteria and viruses are different.
- Antibiotics only work against bacteria, antibiotics do not work against viruses.
- Handwashing is the best way to prevent the spread of bacteria and viruses.

Thank the students for their participation and provide the students an opportunity to ask any remaining questions.

# How are they different?

| Bacteria | Viruses |
| --- | --- |
|  |  |
|  |  |
|  |  |

# True/False

Circle the correct answer for each question.

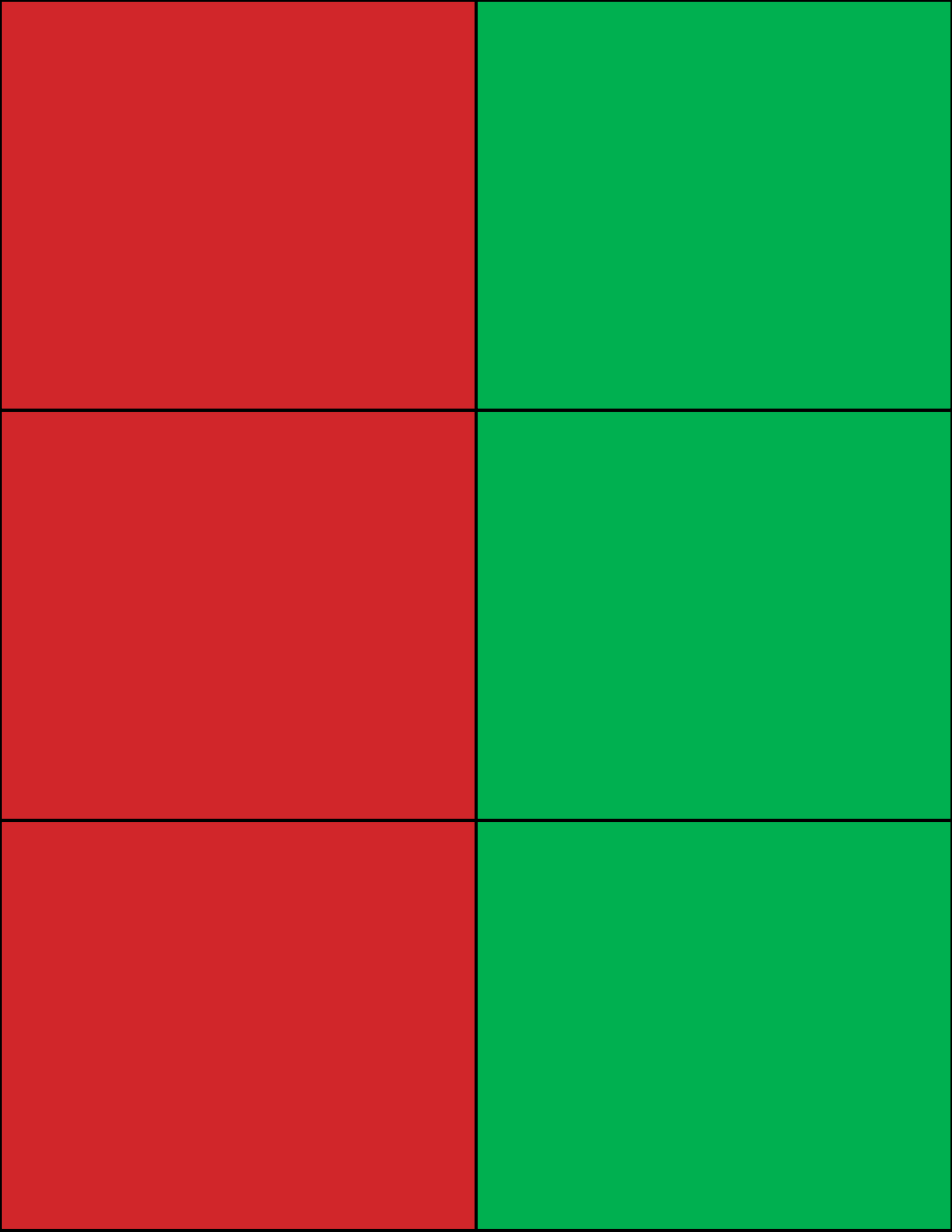
| | | | |
|---|---|---|---|
| **1** | Bacteria cause colds and flus | True | False |
| **2** | Antibiotics only work against bacteria | True | False |
| **3** | There are four steps to good handwashing. | True | False |
| **4** | Our bodies have good bacteria that help us digest food | True | False |
| **5** | Antibiotics sometimes work against viruses. | True | False |
| **6** | Bacteria and viruses are the same. | True | False |
| **7** | Antibacterial soap is better than plain soap. | True | False |
| **8** | We should try to kill all bacteria. | True | False |
| **9** | Handwashing is the best way to prevent the spread of germs. | True | False |
| **10** | Our skin and immune system protect us from diseases. | True | False |
| **11** | When you wash your hands, you should skip your thumbs and wrists. | True | False |
| **12** | Washing your hands once a day is enough. | True | False |
| **13** | All bacteria are bad for humans. | True | False |
| **14** | Antibiotics can make bacteria stronger. | True | False |
| **15** | Antibiotics can affect your digestion by killing the good bacteria. | True | False |
| **16** | Antibiotics save lives, but we need to use them carefully. | True | False |

# Red & Green Cards for T/F Game

- **Use red and green cards on next page**. Print as many copies of the next page as you need to have one set of red and green cards for each pair of students in your class. You can also cut up construction paper to make the cards.

- **Cut cards and laminate if desired**. Each pair of students will have one set of cards.

- **When answering T/F as a group, instead of yelling the answers, the students will each hold up a green card if they think the answer is true, and red if they think the answer is false**. This gives the teacher a way of assessing how many students are understanding the material and allows all students to participate simultaneously.

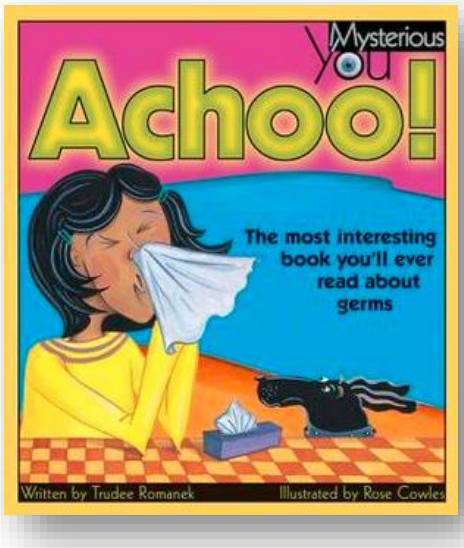


# Optional Activities

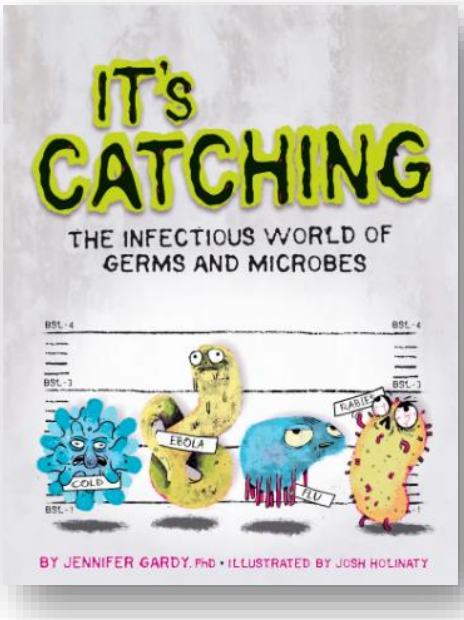
- Grade 4-6 students teach Kindergarten or Grade 1 students how to wash their hands. Grade 4-6 students can form groups and work with a few younger students to teach the six steps of handwashing. Then, with the Glo Germ lotion and UV flashlight, they can demonstrate handwashing, or have younger students practice handwashing.

- Grade 4-6 students can work with younger students to put the steps of handwashing into the correct order, like a puzzle. See **pages 13-16**.

# Reference Books for Grades 4 to 6




**Achoo: The Most Interesting Book You'll Ever Read About Germs**
Trudee Romanek




**It's Catching: The Infectious World of Germs and Microbes**
Jennifer Gardy

# Handwashing Puzzle

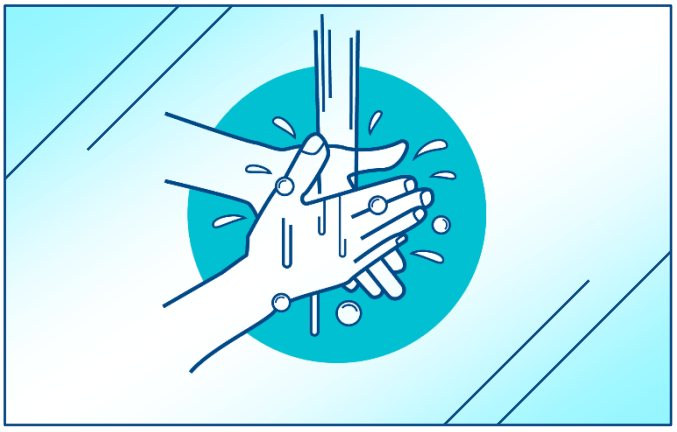
See following pages for larger images. Laminate if desired.

Students can work on remembering steps of handwashing by putting the cards in the correct order. The pictures are currently in the correct order  (wet hands, apply soap, lather, rinse off soap, dry hands, and turn off tap).

**Wet hands**

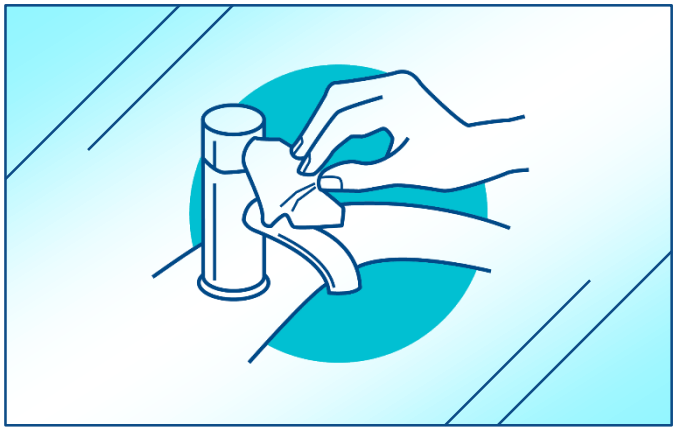
**Apply plain soap**

**Rub hands together**



**Rinse your hands**

**Dry your hands**



**Turn off taps with paper towel**