All About Germs

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Overview:

How can we prevent the spread of germs with young children? In order to stop students from spreading germs we need to make them aware of where germs come from and how they are spread. Close to 22 million school days are missed due to the common cold each year and children have about 6 to 10 colds each year (Hopkins). To keep students in schools and healthy, as well as adults, we need to address how germs are spread and what young children can do to prevent it.

In this unit I define what germs are and the difference between good germs and bad germs. I also include detailed ways to prevent the spread of germs. Finally, the lessons can be taught to kindergarten children and can be adapted for any grade from Pre-kindergarten to 4th grade.

Rationale:

What Are Germs?

Germs are microscopic organisms that can be helpful at times, but also cause disease. Germs can be found everywhere, in the air, in water, on your body, on food, on any surface. There are several categories of germs including: bacteria, viruses, fungi, protozoa, and helminthes.

Bacterium

Bacteria are one-celled organisms that are only visible with a microscope. Not all bacteria are harmful; Less than 1 percent causes disease and some bacteria are helpful to your body. Toxins are produced by many of the disease-causing bacteria and these toxins damage your cells making you ill. Bacteria can cause diseases such as strep throat, meningitis, and cholera. Antibiotics can be taken to cure bacterial diseases.

Viruses

Viruses are much smaller than cells, they invade the cells in your body. When viruses invade the cells in your body they destroy the host cells and the way your cells work. Viruses cause diseases such as influenza, AIDS, hepatitis, and measles. Antibiotics do not cure viruses.

Fungi

Fungi can be found in many different places. Some fungi we eat in foods such as mushrooms, some cheeses, and breads. Some other fungi can cause diseases such thrush, athlete's foot, and ringworm.

Protozoa

Protozoa are one-celled organisms like bacteria, but these one-celled organisms are hunters in your body, looking for other microbes for food. Protozoa typically enter the body through food and water that you eat or drink. Many protozoa live in your intestinal track and cause no harm to the body, other can cause diseases such as diarrhea and pneumonia.

Helminths

Helminths are a large parasite that after entering your body, finds a place to live in your intestinal tract, lungs, liver, skin or brain. In its new home the parasite lives off the nutrients in your body. Some types of helminthes are tapeworms and roundworms. Helminths causing diseases are found most often in developing countries.

Bad Germs vs. Good Germs

Not all germs are bad. Most bacteria are harmless to people and some germs are even helpful to our body. Our bodies need good germs to stay healthy. Many of the helpful bacteria live in our intestines and are important for a healthy digestive system. The good bacteria in our intestines help us to use the nutrients in the food we eat and make waste of what is left over. Some examples of helpful bacteria are Lactobacillus, Bifidobacterium, Penicillum, and Sacchramyces cerevisiae. Lactobacillus is a bacteria found in the digestive tract that aides in the breakdown of lactose and other sugars. Lactobacillus can be found in some of the foods we eat, many fermented foods such as pickles, cheese, and yogurt. Bifidobacterium is also found in the digestive system and aid in the digestion process. Penicillum, which is the most commonly known antibiotic, is the active ingredient in penicillin, the antibiotic used to treat diseases. The fungus, Sacchramyces cerevisiae, which many may know from baker's yeast, is used in many baked goods and in beer. It is also used to treat diarrhea (Kindig, 2012).

Some examples of harmful germs are salmonella, vibrio, and mycobacterium. Salmonella is the harmful bacteria that can lead to typhoid. Salmonella causes symptoms of diarrhea, constipation, fever, and inflammation of bones. Vibrio is harmful bacteria that can lead to cholera. Cholera causes symptoms of diarrhea, abdominal cramps, fatigue and nausea. Mycobacterium, another harmful bacteria, leads to tuberculosis, causing symptoms of less appetite and significant weight loss as well as the coughing of blood and continuous low fever ("Cover your cough," 2010).

Ways to Prevent the Spreading of Germs

Many serious respiratory illnesses such as influenza and whooping cough are spread by coughing, sneezing, or unwashed hands. Preventing diseases in the first place, is the best way to stop the spreading of germs. There are three key ways to prevent the spreading of germs to stay disease free. These key ways are hand-washing, vaccines, and covering a cough or sneeze.

Hand-washing

Hand-washing is the easiest and most effective way to protect yourself against bacteria and viruses and to prevent the spreading of bacteria and viruses. Everyone should wash

their hands several times throughout the day. Hands should be washed before preparing or eating food, after coughing or sneezing, and after using the toilet.

Vaccines

Vaccines are given mostly during childhood, but adults may also need vaccines to continue to prevent illnesses. It is important to be aware of new vaccines that may be available. Being aware of these new vaccines can help to prevent the possibility of future illnesses for children and adults.

Cover a Cough or a Sneeze

The last, but certainly not least, important way that everyone can prevent the spread of germs is to cover a cough or sneeze. Covering a cough or sneeze prevents germs from being spread airborne or from hand-to-hand or hand-to-surface-to-hand. If a tissue is not available when a sneeze or cough is coming, sneeze or cough into the crook of your elbow. This will stop the germs from spreading through the air or from being transferred from your hand to another's hand or other objects.

Basic Hygiene Routines and How They Keep Us Healthy

Hygiene routines should occur every day. Helping children develop hygiene routines at a young age is important to helping them develop a positive attitude towards personal cleanliness that will ideally continue through adulthood, giving the best prevention to contracting and spreading germs and diseases. Important hygiene routines that can be developed are hand-washing and dental hygiene.

Hand-washing should be done several times throughout a typical day. Hands should be washed before eating or touching food, after using the restroom, after coughing, sneezing, or blowing your nose, before and after touching a cut or sore, after touching a pet, and before and after attending to a sick or injured person. When washing hands, it should be done properly to ensure that all germs have been killed. Follow these 5 steps provided from Everyday Health:

1. Wet your hands with clean warm water, if available, and apply soap.

2. Rub hands together to lather soap, be sure to cover all surfaces.
3. Continue rubbing hands together for 15 to 20 seconds. Sing a song such as "Happy Birthday" or "Row, Row, Row Your Boat".
4. Rinse your hands thoroughly under running water to ensure removal of all germs.
5. Use paper towels or an air dryer to dry hands completely. If possible use a paper towel to turn off the faucet. (Melone, 2011)

Dental hygiene is important as well. Micro-organisms can get caught in the plaque in one's gums. Many diseases are related to oral bacteria. The most common is Gingivitis/Periodontitis or most commonly known as Gum Disease.Tooth brushing is an important part of personal hygiene and good health. According to the American Dental Association, a person should brush his or her teeth twice a day using an ADA-accepted fluoride toothpaste. A toothbrush should be replaced every three to four months or sooner if the toothbrush's bristles become frayed. Floss should be used to clean between teeth each day. Bacteria can linger between the teeth where brush bristles cannot reach. ("Cleaning your teeth," 2012)

Objectives: This unit is intended for students in kindergarten. The students spend most of their day in a self-contained classroom only leaving for a 45 minute lunch period, a 15 minute recess, and a 45 minute prep class.

The Objectives of this unit will include the following:

- Students will be able to identify that germs are microscopic organisms that can only be seen with a special microscope
- Students will be able to identify that germs can be found everywhere
- Students will identify ways that germs are spread
- Students will be able to explain how germs make them sick
- Students will create posters of ways to prevent germs from spreading
- Students will identify the difference between good germs and bad germs
- Students will demonstrate basic hygiene routines independently
- Students will identify the role hygiene plays in keeping us healthy

Strategies:

Shared Reading

During shared reading the entire class will read one story or poem aloud. During this story time all the students are able to hear the story or poem and see the pictures. Shared reading will be used to begin most lessons. Shared reading is a valuable tool to model reading for children. It also gives students rich and authentic literature experience even at their earliest stages of reading. Advanced readers are able to be challenged by the language of the selections and with the support of the teacher, students who are not as developed in reading are still gaining reading skills needed for success.

Think-Pair-Share

Think-Pair-Share is another strategy that will be used. During Think-Pair-Share students will think in their head for several minutes about a question or idea, and then they will turn to the person next to them and share their thoughts. Think-Pair-Share allows for an increase in the quality of student responses. It gives students time to think and respond to questions or prompts. It also relieves the pressure off of students who may be intimidated to respond in front of the whole group. As students are discussing their responses they are also talking out their answers and are able to make better sense of their ideas.

Activating Prior Knowledge

The teacher will activate prior knowledge through each lesson. Through activating prior knowledge teachers are helping children to connect the text to what they already know. Activating prior knowledge helps students to begin to make connections to the new text they will be reading. When students are able to make connections to text they become more invested in the text they are reading or listening to.

Graphic Organizers

Students will use graphic organizers throughout this unit. Graphic organizers are a tool that allows students to visually express ideas and concepts. When students use graphic organizers they are able to see undiscovered patterns and relationships that they may not have seen by simply reading or listening to a story. Graphic organizers also help to facilitate conversation about the story and make an excellent reference.

Modeling

Modeling will be used by the teacher to help convey understanding of new ideas and methods. Modeling is when the teacher demonstrates how to complete different activities by saying aloud the thought process.

KWL Chart

A KWL chart is a graphic organizer that can be used in any subject area. The K stands for what the students already know. The W stands for what the students want to know about the subject. Finally, L is for what the students learn about the subject. The KWL follows the students throughout an entire unit or theme.

Standards

The Core Curriculum of the School District of Philadelphia is aligned to the Pennsylvania Academic Standards for Kindergarten.

10.1-3.1 Fundamentals of Good Health

- Demonstrate basic hygiene routines independently
- Discuss the role hygiene plays in keeping us healthy
- Identify how to use medicine safely
- Describe how fundamental practices keep us healthy
- Describe the people, practices and tools that keep us healthy

1.1.1 Purposes for Reading

- Read text for a variety of purposes during work and playtime
- Choose text based on identified need and purposes
- Identify different purposes for text

Classroom Activities:

Lesson 1: What are germs and where are they?

Objectives:

- Students will be able to identify that germs are microscopic organisms that can only be seen with a special microscope

- Students will be able to identify that germs can be found everywhere.

Materials:

- Chart paper for KWL (Know, Want to Know, Learned) lists
- *Germs! Germs! Germs!* by Bobbi Katz
- Paper
- Crayons
- Scissors
- Tape

Procedure:

Gather students on the carpet. Tell students that we will be starting a unit on germs. Ask students what they know about germs. Create a list of all the things students already know about germs (K chart). Then ask the student what they would want to learn about germs. Create a list of all the items the students would want to know about germs (W chart). Then start a third list, the L for learned and as students learn new facts about germs add them to this list throughout the unit.

Introduce the story *Germs! Germs! Germs!* by Bobbi Katz to the students. Read aloud emphasizing that germs are everywhere, but can only be seen with a microscope. Explain to students that in one sneeze anywhere from 40,000 to 100,000 germs are spread all over that we can not see. Have children draw and color pictures of small germs on paper. Then have the students tape these pictures around the room of everything they've touched in the last ½ hour (the time since lunch, since the story, since recess, whichever works best for your classroom to understand the ½ hour). After students have taped their germs around the room have them stop and look around at all the germs. Allow them to discuss how they have picked up and spread the germs all over the classroom and to eachother. Point out places where several students have touched the same spots in the classroom. Add "Germs are everywhere" to the L for Learned chart paper.

Lesson 2: *Germs Make Me Sick!*

Objectives:

- Students will be able to identify that germs are microscopic organisms that can only be seen with a special microscope
- Students will be able to identify that germs can be found everywhere.
- Students will be able toexplain how germs make them sick.

Materials:

- KWL chart paper
- *Germs Make Me Sick!* By Melvin Berger
- Writing paper
- Pencils

Procedure:

Review the KWL chart from the prior lesson, discussing that we've learned germs are microscopic organisms that can only be seen with a special microscope and that germs are everywhere. Then ask the children what germs do. Read aloud the story *Germs Make Me Sick!* by Melvin Berger. Allow for questions and discussion throughout the story. Have students think, pair, share something they've learned from the story about what germs do. Students will individually draw and write one sentence to show and describe what germs do. Add what students have learned about what germs do to the L chart.

Lesson 3: How are germs spread?

Objectives:

- Students will be able to identify that germs are microscopic organisms that can only be seen with a special microscope
- Students will be able to identify that germs can be found everywhere.
- Students will identify ways that germs are spread.

Materials:

- KWL chart paper

- *Germs Are Not For Sharing* by Elizabeth Verdick and MariekaHeinlen or *Body Buddies Say…Wash Your Hands!* by Leeann Wenkman
- Glitter
- Hand soup
- Accessibility to running water
- Paper towels

Procedure:

After reading the story explain to students that even though we cannot see germs we're going to see how germs can be spread from one person to another. This activity might be best done outside or be sure to have a vacuum available. Fill a paper plate with glitter. Have one student come up and dip their hands in the glitter. Show students how much glitter has stuck to their hands and that we are pretending the glitter is microscopic germs. Now have that student shake hands with one person. Now look at that student's hands. Point out how much glitter has gone from the first child's hands to the next. Continue to have students shake hands with one or two more children continuing to spread the "germs". Remind students that the glitter is a lot like germs. Germs spread when we touch them and each other and this is how we catch colds and diseases. This is the same for if we touch something, such as the desk, and it leaves glitter, then another child touches the desk and picks up the glitter. Ask students if they know a way that we can stop the germs/glitter from spreading. Encourage answers until someone answers to wash your hands with soap and water. Have students wash hands with soap and water. (You may also use finger-paint instead of glitter.) Have students gather together again on the carpet to add to the L column for what they've learned about germs during this lesson.

Lesson 4: How can we prevent germs from spreading?

Objectives:

- Students will be able to identify that germs are microscopic organisms that can only be seen with a special microscope
- Students will be able to identify that germs can be found everywhere.
- Students will identify ways that germs are spread.
- Students will demonstrate basic hygiene routines independently.

Materials:

- KWL chart paper
- *Wash Your Hands!* by Tony Ross
- Poster with hand-washing song
- Running water
- Hand soap
- Paper towels
- Paper
- Crayons

Procedure:

Gather students together on the carpet. Activate prior knowledge by reviewing what students learned about yesterday on the L chart. Review that germs are microscopic and cannot be seen without a microscope. Remind students of the glitter experiment and how we came up with the solution that hand-washing could help to stop germs from spreading, like hand-washing removed the glitter from the students' hands. Read aloud the story to *Wash Your Hands!* by Tony Ross, emphasizing the important steps to hand-washing. Allow students to comment and ask questions throughout the story. After the story explain to students that they will practice proper hand-washing. One of the keys to proper hand-washing is to wash with soap and water for 15 to 20 seconds. Teach students the following song sung to Row, Row, Row, Your Boat ("Kinderkids," 2005).

Wash, wash, wash your hands
Wash them everyday
Tops and bottoms and in between
To keep the germs away!

Allow for each student to dip their hands in glitter and then practice washing off all the "germs" while singing the new hand-washing song. Students are to use soap and always dry their hands with a paper towel. Gather students together to add to the L chart things they have learned during this lesson. Open discussion to other ways students can stop germs from spreading such as covering a cough or a sneeze. Have students practice the appropriate way to cover a cough or sneeze in the crook of the elbow.

Lesson 5: I'm a Germ Stopper! Culminating Activity

Objectives:

- Students will be able to identify that germs are microscopic organisms that can only be seen with a special microscope
- Students will be able to identify that germs can be found everywhere
- Students will identify ways that germs are spread
- Students will create posters of ways to prevent germs from spreading
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- Students will demonstrate basic hygiene routines independently
- Students will identify the role hygiene plays in keeping us healthy

Materials:

- Markers
- Poster board, cut in half, one board per 2 students
- Variety of books on germs
- Germ Stopper badge (see appendix)

Procedure:

To culminate everything the children have learned about germs begin be reviewing and discussing everything the students have learned from the L chart. Explain to the students that we are now "Germ Stoppers"! Give each student a badge to wear during this lesson (see appendix). As "Germ Stoppers!" we want to teach other children how to be germ stoppers so we can continue to stop the spread of bad germs. Tell students we are going to make posters to hang around the school to inform students about the different things we've learned, what germs are, where they are, and how to stop them from spreading. Allow students to pick a partner to work with. Then have them think, pair, share about what they can draw and/or write on their poster. Have each pair tell you their idea before going to work; this will help to avoid having all the same poster. Allow children an ample amount of time to complete their posters. Have each group share their poster with the class and then post posters around the school.

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Resources

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Appendix