

## **Grade 2: Historical Lesson**

### **Lesson 8: Louis Pasteur, Andrew Taylor Still, and the Digestive System**

#### **Objectives:**

Students will obtain information about the discoveries and contribution made by Louis Pasteur and A.T. Still.

Students will explore the world of germs. Students will think about where germs are found as well as the idea that there are good and bad germs.

#### **Materials:**

- Milk Cartons- (Have the students rinse and save their milk cartons from lunch. Check for the word pasteurization on the milk carton. If the small cartons do not have them bring in milk jugs from home.)
- Orange markers, highlighters, or crayons
- Glo Germ
- Black light
- Paper/pencil
- Venn Diagram (See Figure 1)

#### **Children's Literature:**

- "The Value of Believing in Yourself: Louis Pasteur" By Spencer Johnson, M.D.
- "Germs Make Me Sick" By Melvin Berger

#### **Background information for the teacher:**

For information on Louis Pasteur please visit...

[http://en.wikipedia.org/wiki/Louis\\_Pasteur](http://en.wikipedia.org/wiki/Louis_Pasteur)

For information on A.T. Still please visit...

<http://www.kcom.edu/load.asp?url=/newmuseum>

#### **Vocabulary:**

Pasteurize – heating a liquid to kill harmful germs

Germ– a living thing that is too small to see with the naked eye

Bacteria– a type of germ that can make you sick

Vaccination/Vaccine- a shot to gain immunity to prevent a specific disease

Hydrochloric Acid - substance made by the stomach to help break down food and kill bacteria

### **Engage**

Ask:

How do we get sick? What makes us sick?

How do germs get inside your body?

Are there germs in your body right now?

Are there germs in the food you eat?

Can we see germs? Are germs visible?

Read the Book “Germs Make Me Sick” By Melvin Berger

### **Explore:**

Ask:

Are there germs on your body? (yes)

How do you know there are germs on your body? (get sick from them)

Where do you think most germs are? (hands) Why?

Name some places your hands touch.

What do you do to keep your hands clean?

How often do you wash your hands?

Say: Based on our observations that our hands touch more things than other parts of our body, our hands probably have more germs than other places on our bodies.

Handout a blank sheet of paper.

Say: Today we are going to look for germs on our hands.

Directions (say):

1. Label the top of your paper “before”
2. Trace each hand. Below the traced hand label the left hand “top” and the right hand “bottom”.
3. Turn the sheet of paper over and label the top “after”.
4. Trace each hand again and label the same as above.
5. When you have finished labeling and tracing, come to the front and I will put some Glo Germ on your hands. It is like lotion. Rub it in really well. Get it on every part of your hands. Make sure you don't miss a spot.

6. Explain: Glo Germ is a “magic” lotion that when we put it under a black light (show the light) your hand will glow wherever there are germs. Each of you will get a turn to look at your hands under the black light. When you come up to look at your hands bring an orange crayon/highlighter/marker with you. We are going to record where you see germs for your **left hand only**. Where ever your left hand glows under the black light you will need to highlight the similar spot on your paper. Look at the top of your **left** hand and then color in on the hand labeled “top” where it glowed. Next look at the bottom or palm of your **left** hand and color in orange wherever your palm glows on the hand labeled “bottom”.

After all the students have finished recording their findings ask...

How do we get rid of germs on your hands? (Wash)

What does washing your hands include? What do we need to do? (Water, soap, scrubbing)

Take a field trip to the bathroom so everyone can wash their hands. Upon completion, again put a little Glo Germ on each student’s hands and look under the black light.

Have the students flip their papers over and record the information in the same way they did before they washed their hands.

**Explain:**

Put students in groups of 3 or 4 to compare their before and after drawings. Draw conclusions. Did you find any similarities? (Talk about hard spots to clean.) Have each group share their findings and what this means about washing their hands.

Ask: How do we know that there are germs? Can we see them? (no)

Who came up with the idea that there are germs?

Say: Germs are microscopic organisms. Germs have many names, pathogen, microbe, bacteria, virus, microorganism, microscopic organism, fungi, protozoa, etc... They are extremely tiny and are able to do very harmful things. Bad bacteria can cause pneumonia, earaches, strep throat, etc...

Ask: How can we stop germs? First we need to know where germs hang out. Where do you think germs really like hanging out? (Where it is warm, dark, and moist.) Where are these places on your body? Where is your body moist? (mouth, nose, cuts) Where is it dark and warm? (mouth, ears)

Say: Germs try to enter any way they can.

Ask: What does that mean you should do when you have a cut? (wear a bandage)

Read: “The Value of Believing in Yourself: Louis Pasteur” By Spencer Johnson, M.D.

Explain:

Louis Pasteur was born in France in 1822. (Show students on a map/globe where France is and talk about the date.)

He discovered some very important things... (Explain each)

1. Confirmed Germ Theory –He didn’t actually come up with the “Germ Theory” but he confirmed that it was true through a lot of experiments. The Germ Theory is the theory that microorganisms are the cause of many diseases.
2. Invented the process of Pasteurization – He found the microorganisms were contaminating some beverages. Knowing this he came up with a process of removing harmful microorganisms (germs) from food by using heat. Have the students take out their Milk Cartons and look for the word pasteurize. Explain that Pasteur helped come up with the idea of heating liquid to kill bad germs. Now we can drink milk without any worries.
3. Created many Vaccinations- a small weakened form of a virus could be given to protect against the strong virus. Found rabies vaccinations.

**Expand:**

Ask: Are there good germs? (let students guess)

Say: Like Louis Pasteur, there is another historical figure that has had a significant role in our history and because of that he has changed things today. Andrew Taylor Still was a doctor. What do doctors do? When germs make us sick doctors help us feel better.

Andrew Taylor Still was a doctor about 150 years ago. However, he came up with a new idea. He believed that the human body was created perfectly and was capable of healing itself. Based on his idea that the body was capable of healing itself he came up with a new profession called a Doctor of Osteopathy. This is a doctor just like you think of but one who bases his belief on the body’s self-healing mechanisms. In other words, the body has tools to help heal and protect itself. Not only did Andrew Taylor Still come up with the new profession of Doctors of Osteopathy but he started the first school and today there are many Doctors of Osteopathy. Typically you just call them “doctor” but if you asked you would find that the rest of their title is more specifically a Doctor of Osteopathy.

Ask: If you heard that your doctor is a Doctor of Osteopathy, what would you know their belief about the body is that is special? (The body has tools that help it heal and tools to protect itself.)

Ask: Would A.T. Still and other Doctors of Osteopathy believe that there are “good” germs? (yes)

Say: Good germs or good bacteria in our digestive system are one of those ways that the body is able to help protect itself. When we don’t have those good germs in our digestive system we can get a stomach ache or feel sick.

Not all germs are bad. Microorganism is another name for germ. There are microorganisms that help us. Think of them as good germs. Here are a few examples...

1. Yogurt- bacteria curdles the yogurt
2. Cheese – bacteria curdles the milk that is used to make cheese
3. Laundry detergent – tiny microorganisms are in detergent that help clean laundry
4. Mouth has good germs to help fight harmful germs that try to grow in the mouth
5. Some germs are used to make vaccinations
6. Some medicine and vaccines are made from bacteria

We are going to focus on the bacteria that help us digest our food. We have been learning about the digestive system. In the digestive system there are “good bacteria”. Good bacteria in the digestive system help...

1. make vitamins A and B
2. help absorb nutrients
3. help you to digest food
4. help your body make immune-boosting substances (antibodies)
5. good bacteria make less room for bad bacteria

Ask: Does our body have good “germs”? (yes)

Andrew Taylor Still believed that our body has natural ways to take care of itself. Was he right?

**Evaluate:**

**See Figure 1:** Venn Diagrams

On the first Venn Diagram have the students write Louis Pasteur and Andrew Taylor

Still. Have the students list differences on each side and similarities in the center.  
(Answers to look for are: who they are, why they are important, their discoveries, and relate what they did to germs, etc...)

On the second Venn Diagram have the students write Good Germs and Bad Germs. Next have them list differences on each of the sides and put any similarities in the center.  
(Answers to look for: where they are found, what they do, size, names of germs, how they affect the body etc...)

### **Missouri Standards:**

#### **Frameworks: Health:**

Health Maintenance and Enhancement

##### A. Personal and Family Health

1. Personal health is enhanced by behaviors that included care of skin, hair, teeth, gums, eyes, nose, ears and nails

a. Identify and discuss how personal behaviors can enhance the health of an individual and reduce the chance of disease, etc...

#### **Grade Level Expectations: Science:**

Strand 8: Impact of Science, Technology and Human Activity

3. Science and technology affect, and are affected by, society

A. People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done.

**Figure 1**

