

## BASIS Lesson Plan

**Lesson Name:** Germs and Your Body

**Grade Level Connections:**

*Next Generation Science Standards:* Kindergarten, Life Science (K-LS1)

*FOSS Next Generation Edition:* Kindergarten, Life Science (Animals Two by Two)

*\*Note to teachers: Detailed standards connections can be found at the end of this lesson plan.*

### Teaser/Overview

Have you ever had a cold? Did you know that germs – which are too tiny for your eyes to see – can sometimes make you sick? Your body has ways to fight germs to keep you healthy. Through several hands-on activities, students will use their senses and observation skills to learn how their bodies defend against germs. Students will compare “gak” to mucus, learn how tears keep germs out of their eyes, and how nose hairs keeps germs out of their bodies.

### Lesson Objectives

- Students will learn that there are tiny living creatures called germs that live everywhere, but are too small for our eyes to see.
- Students will use models to represent different parts of our bodies that function to fight off germs.
- Students will use mathematics and computational thinking to determine which of two conditions impact the greatest number of germs.
- Students will understand that the structure of parts of our bodies allows us to keep out germs that make us sick.

### Vocabulary Words

- **Germs:** tiny living things that can make us sick
- **Mucus:** slimy material that keeps your nose wet and traps germs and dirt
- **Health:** when your body feels good and not sick
- **Scientist:** someone who likes to learn about how things work and how to understand things

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- **Model:** a representation or an example of something; pretending
- **Microscope:** a camera that can take pictures of very tiny things

## Materials

### Volunteers will bring:

- Foil plate
- Foil plate with brush
- 2 baggies with ~50 beans
- gak
- Bowl
- Lacrosse ball painted to look like an eye
- Baggie with glitter
- Hand lotion
- Paper towels
- Pictures with vocabulary words
- **Agar plates – not in kit**
- **Lab coat and safety glasses – not in kit**

## Classroom Set-Up

We will start the lesson with an introduction, having the students at the central carpet area. Students will then rotate through three stations, so please place students into three equal sized groups prior to our arrival. At the end of the lesson, students will return to the carpet for a wrap-up discussion. Nametags for calling on students are always helpful. We will need access to a sink, whiteboard space, and markers.

## Classroom Visit

### 1. Introduction (15 minutes)

#### Role Model Introduction:

Being a role model is an important part of being a BASIS volunteer! Begin your lesson by explaining who you are and what you do as a scientist. Feel free to tell your “story” as if giving an elevator pitch to kindergartners: Why did you become a scientist? What questions are you trying to figure out? What do you do in your job? Why should students relate to you? Feel free to bring in photos, specimens, and other props. Don’t forget to let your personality shine through!

### Topic Introduction:

After you introduce yourselves as role models, take some time to introduce the topic of this lesson: *germs and the body's defenses against them*. It may be helpful to keep the suggested take-away in the back of your mind throughout the lesson: **Our bodies have special structures to protect us from tiny germs that can make us sick.**

Your topic introduction should follow the outline below. As much as possible, try to frame this information as questions posed to the class, rather than as a lecture. This helps activate students' prior knowledge and facilitates student-guided conversation.

- Intro: We're all scientists! Who knows what a scientist is? [Scientist defined]
- Volunteer 1 sneezes on Volunteer 2 – Volunteer 2 says "Ahh, what did you get on me??" and Volunteer 1 responds, "Just germs! I guess I'm a little sick."
- Does anyone know what germs are? Germs are tiny living creatures!
  - Show picture of germs taken with a microscope [Microscope defined]
- Have any of you ever been sick? [engage kids] What did it feel like? How did you get better?
- What did your body do when you were sick?
  - Did your nose run?
  - Did your eyes water?
  - Other things (fever, stomach ache, sleepy)
- Do these things make us sicker, or help us get better?
- Our body has many ways to keep us healthy. [Health defined] Together, we're going to be scientists and figure out how!
- Now, I am going to divide you into three groups and each group will go to a different station. Then after you have been to all three stations, we will come back together and talk about what you figured out!

### Teaching Tip: Say, Write, Show

- Bring in photos and props to illustrate the topic intro
- Write new vocabulary words, key terms, and brainstorm lists on the board
- Refer back to the board to engage visual learners and English Language Learners

## 2. Learning Experience (30 minutes)

Students will be split into three groups. Each group will head to one of three stations set up around the room; at each station, they will interact with a new volunteer and explore a new way of how our bodies protect us from germs. One volunteer (or the teacher) will keep time; every ten minutes, the groups will rotate to a new station. Remember that all three of these stations are designed to address

the takeaway in a particular way: **Our bodies have special structures to protect us from tiny germs that can make us sick.**

### Station 1: Mucus

1. Engage students in a conversation about what in our nose might keep out germs
  - a. Point to your nose to help students understand
  - b. Use the picture of a man with lots of mucus coming out his nose
  - c. When someone guesses boogers/snot, etc, introduce the science word, **mucus**. Have the students repeat the word mucus.
  - d. Introduce the idea that **mucus** has a **structure** that might help trap germs.
2. Make observations with the model of “gak”
  - a. Give each student a small bit of “gak”. Explain that it’s a **model** for mucus. (We’re going to pretend that this “gak” is mucus! It’s not really mucus, but we’re going to use “gak” as a model for mucus.)
  - b. Review the definition of mucus – the science word for boogers.
  - c. Ask the students to make observations about the mucus.
    - i. Is it stiff or stretchy?
    - ii. Is it soft or hard?
    - iii. Is it sticky?
    - iv. What color is it?
    - v. What does it smell like?
  - d. Give each student a small handful of beans (5-6 each). Explain that it’s a **model** for germs.
  - e. Ask the students if they can get the germs stuck in the mucus. Let them play and make observations.
  - f. Guide the students towards the realization that the **structure of mucus lets it trap germs**.
3. Connect the activity to the big picture
  - a. Invite students to reflect on what would happen if they blew their nose when they were sick. Where would the germs go?
  - b. Emphasize the overall takeaway of the lesson: **Our bodies have special structures to protect us from tiny germs that can make us sick: for example, mucus in our nose helps to keep germs out!**

#### Teaching Tips: Guide Discussion with Kindergarteners

- Start with something all students can relate to, so everyone can start on the same page: eg, When you blow your nose, a sticky substance ends up in your tissue.
- Be explicit about new vocabulary so that all students can follow along
- Guide students to figure things out together by turning your statements into questions
  - Instead of saying: “Mucus traps germs.”
  - Try: “What would happen if there were germs next to your mucus? Would they get trapped?” etc.

## Station 2: Nose hair

1. Engage students in a conversation about what we have in our nose
  - a. Students may think of mucus. Many students may not know they have hair in their noses.
  - b. Ask if they've ever seen hair in the nose of their grandpa or big brother or mom, etc
  - c. Introduce the idea that **nose hair** has a **structure** that might help trap out germs.
2. Guide students through the nose hair activity
  - a. Show students the two pie plates, with and without nose hair
  - b. Ask the students to see what's different about the two plates. Introduce the idea that the brush is a **model** for nose hair.
  - c. Introduce the beans as a **model** for germs.
  - d. Ask the question, which nose will trap and keep out the most germs?
  - e. Give each of the students a small handful of beans to drop through the nose without nose hair. Demonstrate, and then let each student have a turn.
  - f. Engage students to count the number of germs that got trapped outside the nose.
  - g. Repeat the activity with the nose that has nose hair, again counting the number of germs that got trapped.
  - h. Guide the students towards the realization, the **structure of nose hair traps and keeps out germs.**
3. Connect the activity to the big picture
  - a. Invite students to reflect on what would happen if they breathed in germs, if they have nose hair.
  - b. Emphasize the overall takeaway of the lesson: **Our bodies have special structures to protect us from tiny germs that can make us sick: for example, nose hairs in our nose help to trap and keep out germs!**

### Classroom Management Tips: Station Rotation

- Keep students from getting too restless by moving them through stations
- It helps to keep things orderly. When it's time to rotate, have the leader announce that all students should stand up in place and NOT MOVE until you say so; point out where each group will move to; confirm that everyone understands; THEN instruct students to move to the next station.
- Have a volunteer keep time and tell station leaders to wrap up at 9 minutes.
- Ask the teacher if you need help!
- Remember that students might visit your station first, second, or third: don't assume prior knowledge from another station!

### Station 3: Tears

1. Engage students in a conversation about what we have in our eyes
  - a. What would happen if we got germs in our eyes? How would we get them out?
  - b. Has anyone noticed that your eyes sometimes water? Why is that?
  - c. Introduce the idea that **tears** have a **structure** that might help clean out germs.
2. Guide students through the tears activity
  - a. Introduce the lacrosse ball as a **model** for an eyeball.
  - b. Introduce glitter as a **model** for germs.
  - c. Cover the eyeball with lotion and glitter, and let the students take turns wiping off the glitter with a dry paper towel. **Count** how many students wiped off the eyeball, and notice how many germs are left.
  - d. Repeat the condition, but with water, to **model** tears.
  - e. Which condition cleaned off germs fastest?
  - f. Guide the students to discuss how the **structure of tears helps clean out germs**.
3. Connect the activity to the big picture
  - a. Invite students to reflect on what would happen if they had germs in their eyes, but not tears.
  - b. Emphasize the overall takeaway of the lesson: **Our bodies have special structures to protect us from tiny germs that can make us sick: for example, tears in our eyes help to clean out germs!**

### 3. Wrap Up: Review and Discuss the Learning Experience (10 minutes)

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Have students rejoin you on the carpet for a wrap-up discussion.

- What are germs?
- What did we learn at station 1/2/3?
- Reiterate how our bodies have special structures that help us fight off germs and keep us healthy.
- Prompt students to think about what other questions they would investigate in the future to better understand how our bodies help keep us healthy

### 4. Connections & Close (5 minutes)

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**Draw in connections to the real world around students:**

- What can we do in this very classroom to help keep us healthy? (wash our hands, through tissues in the trash can)
- If possible, tie lesson into your research or role model story
- Suggest some more examples of ways that our bodies help us stay healthy (get a fever to kill off bad germs; tiny parts in our blood that fight against the tiny germs)

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**Close:**

- Reiterate for students that science helps us learn about our bodies and how we stay healthy
- Ask students if they have any questions about science or being a scientist
- Close with a good bye and a thank you, and encourage the kids to keep thinking about ways their bodies keep them healthy

**Follow Up: After the Presentation**

Teachers who wish to extend the impact of this lesson may find the following CRS web pages useful:

- <http://www.crscience.org/educators/helpfulreports>
- <http://www.crscience.org/educators/treasuretrove>

**Standards Connections****NGSS:**

- Connections by topic  
Life Science: K. Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment
- Connections by disciplinary core ideas  
Life Science: K-LS1. From Molecules to Organisms: Structures and Processes
- Connections by scientific & engineering practices
  - 2. Developing and using models
  - 5. Using mathematics and computational thinking
- Connections by crosscutting concepts
  - 2. Cause and effect: Mechanism and explanation
  - 6. Structure and function
- Connections by performance expectation  
K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.

**FOSS Next Generation Edition:** Kindergarten Life Science: Animals Two By Two Module