

Learning Target: I can conduct investigations to support a claim that microorganisms are all around us and can be beneficial or harmful.



Microorganisms Bacteria Collect, Grow, & Analyze Lab

Claim: What areas in your classroom do you believe contain the most amount of bacteria? I believe that... _____

Part 1 Instructions: Put the following words in their correct place as you read the cloze read below.

gut	beneficial	bacteria	digest	harmful	wash
spoil	clean	sickness	host	infect	contaminated

Some microorganisms are _____ to us and some microorganisms are harmful to us. We as humans need _____ and their genes more than you know. One of the most important things microbes or microorganisms do for us is to help us _____ food. The mix of microbes in your _____ can affect how well you use and store energy from food. Microorganisms in our gut can produce pain-relieving compounds, antioxidants and vitamins to protect and nurture our body. Also, they help fight off _____ bacteria that can produce toxins in our body that cause disease and _____. Harmful bacteria can cause food to _____, diseases, and infections. Harmful bacteria often need a _____ so they can grow and multiply to _____ other areas of the body or other organisms. That's why they say in order to keep the germs away we need to _____ our hands after touching anyone who is sneezing, coughing or blowing their nose. Don't share things like towels, lipstick, toys, or anything else that might be _____ with respiratory germs. Also don't share food, utensils or beverage containers with others. In other words, stay fresh and stay _____

heat	agar	stop	85 & 100	thermometer
space heater	warm	incubator	die	

Bacteria need a _____ place to grow. At low temperatures most bacteria either _____ growing or grow very slowly. At high temperatures, many bacteria will not grow and will _____ because of too much _____. When we collect the bacteria we will place them on _____ plates to help them grow. Bacteria need to be placed in an _____ so that you can easily see the growth of the bacteria. An incubator is a controlled environment for small or premature organisms to grow, like premature babies. We will use plastic bins as incubators in this experiment. The temperature also needs to be between _____ degrees Fahrenheit for the bacteria to grow. We will setup a _____ and/or lamp to make the temperature warm enough for the bacteria to grow. We will use a _____ to make sure the temperature is between 85 and 100 degrees Fahrenheit before placing the agar plate with bacteria in it into the incubator bins. We will have fun and enjoy our awesome lab today!

Part 2 Materials: - Agar plates - cotton swabs (Q-tips) - 1 cup of water per group

-Clorox wipes - plastic storage bins - card board box (or dark place to put bacteria)

-Ziploc bag for disposal of agar plates - thermometer - marker - space heater/lamp

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Growing Bacteria Video Example

Part 3 Lab Instructions:

1. You will be in groups of 2.
2. Each group will receive an agar plate, marker, cotton swabs, 1 cup of water, and a Clorox wipe
3. Your group will turn your closed agar plate upside down and draw a line dividing the agar plate into three sections. This will allow each group to sample three different surfaces.
4. Your group will use your cotton swabs to sample different surfaces in your classroom, hallway or in other places at your teacher's discretion.
5. You will take your sample swab and wipe it in the specific area that you drew the lines on.
6. Write your name in small writing under the sample you collected.
7. Repeat steps 5 and 6 until you have filled in all three of the divided spaces on your agar plate and place the top back on the plate.
8. Place your agar plate into the incubator bin for your class.
9. Your teacher will store the incubator bin a box or dark closed area where the temperature is at least 85 to 100 degrees Fahrenheit using a space heater or lamp.

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Post Lab Questions:

1. Why did you have to use agar plates for this lab? _____
2. Why did you have to use a space heater or lamp for this lab? _____
3. What is the purpose of the incubator in your lab? _____
4. Why do you think the bacteria have to be placed in a dark, warm place? _____
5. Why do you think they like to keep hospitals cold? _____

Evidence: Did you find any evidence to support or deny the claim you made at the beginning of this experiment? Explain the evidence you found. _____

Reasoning: Explain how or why your evidence proves your claim to be right or wrong. _____