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Week 2: Microbiology Foundations

Module 5: Anti-Bacteria

Lesson: Control, Not Elimination: How Humans Manage Bacteria

Lesson Overview	
Students learn that managing bacteria is about using the right level of control, not eliminating all bacteria. They apply evidence to evaluate how different methods, such as sanitization, disinfection, and antibiotics, are used in real-world situations	
Learning Targets	Vocabulary
Explain how bacteria grow and how their growth can be controlled. Compare different methods used to control bacteria. Use evidence to decide the correct level of bacteria control in real situations.	Sterilization killing all bacteria Disinfection killing most bacteria Sanitization reducing bacteria to safe levels Degerming removing many microbes from the skin through handwashing and personal hygiene practices. Antibiotics medicine that kills bacteria in the body Resistance when bacteria are no longer affected by antibiotics
Materials	Instructional Notes
Module Method cards (sterilization, disinfection, sanitization, degerming, antibiotics) Scenario cards (A–D) Evidence cards Whiteboard or chart paper Student notebooks	This lesson builds on students' understanding that bacteria can both help and harm the body. Students may think that more cleaning is always better. Emphasize that different situations require different levels of bacteria control. Reinforce that overusing antibiotics can harm beneficial bacteria and contribute to antibiotic resistance.



Learning Experience

8 min	Opening	Display the question: "Should everything around you be completely bacteria-free all the time?" Provide three choices: YES, NO, and NOT SURE. Ask students to make a decision first and then explain their reasoning. Students: Move to the area that matches their choice. Write one reason supporting their choice. Turn and talk with a partner. Decide which explanation is strongest. Share 1–2 explanations with the class.
15 min	Module	Focus: • How do humans control bacteria, and why don't we eliminate all of it? Guiding Questions: • What conditions do bacteria need to grow? • How can those conditions be changed to control bacterial growth? • What are the differences between sterilization, disinfection, and sanitization? • What problems can antibiotics cause? Quick Checks: • Thumbs up/down: "Sterilization is needed in all situations." • Turn-and-talk: "When would you NOT use antibiotics?"
15 min	Application	Introduce the task: "You are health and safety experts choosing the best level of bacteria control for different situations." Distribute or display the method options and scenario cards. Direct students: Choose the best method for each scenario and be ready to explain your reasoning using evidence. Students: Step 1: Identify Key Information Read each scenario and identify important details such as the location, level of risk, and purpose. Step 2: Connect to Learning Match the best control method to each scenario using evidence. Step 3: Make a Decision For each scenario, choose one: Sterilization, Disinfection, Sanitization, Degerming, or Antibiotics (if appropriate). Step 4: Explain Reasoning Write the chosen method. Include at least one piece of supporting evidence. Choose one scenario to share with the class.



		Scenarios: A: Cleaning kitchen countertops after cooking B: Preparing surgical tools for an operation C: Washing hands before eating D: Taking antibiotics for a mild illness Sentence Frames: "This situation needs _____ because _____." "Evidence shows _____, which means _____."
2 min	Reflection	Describe one situation where you would control bacteria instead of eliminate it. Explain why.
2 min	Career Connections	Health science professionals, surgeons, and public health workers must choose the right level of bacteria control to keep people safe. Using a method that is too strong or too weak can create problems. These decisions help prevent infections, protect beneficial bacteria, and reduce the risk of antibiotic resistance.