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Week 5: Pharmacology

Module 1: Introduction to Pharmacology

Lesson: Why the Same Medicine Doesn't Always Work the Same Way

Lesson Overview	
Students investigate how medicines work in the body by examining how absorption and distribution affect treatment speed. They use evidence from the module to explain why different methods of drug administration can lead to different outcomes and apply that understanding to a new situation.	
Learning Targets	Vocabulary
Explain that medicine must enter the bloodstream before it works. Describe how absorption and distribution affect treatment speed. Use evidence to explain why different delivery methods lead to different outcomes.	Absorption when medicine enters the bloodstream Distribution when medicine travels to where it is needed Administration how medicine is given Drug cycle how medicine moves through the body
Materials	Instructional Notes
Module Student response sheets Whiteboard or chart paper	This lesson builds on students' understanding of medicine by focusing on what happens after a medication is administered. Students move beyond the idea that medicine simply "works" and begin developing an understanding of how medicines enter the bloodstream and travel through the body. Students often believe that stronger medicines always work faster or that all medicines work in the same way. This lesson prepares students for future learning about treatment decisions and helps them understand why healthcare professionals must consider both the medicine and how it is delivered.



Learning Experience

8 min	Opening	Present the scenario: Person A takes a pill for a sore muscle. Person B applies cream to a sore muscle. "Who feels better first?" Students choose an answer independently, write one reason supporting their choice, and discuss their thinking with a partner. Add the constraint: "Both used the same medicine and the same amount." Students reconsider and revise their explanation if needed. Reveal that the pill worked faster. Ask students to explain why that might happen. Students write a revised explanation. Sentence Frame: "I first thought _____, but now I think _____ because _____ affects how fast medicine works."
15 min	Module	Focus: What must happen inside the body before medicine can work? Guiding Questions: • What happens during absorption? • What happens during distribution? • How can the route of administration affect how quickly a drug enters the bloodstream? • Why might different treatments work at different speeds? Quick Checks: • Thumbs up/down: "Medicine can work before it enters the bloodstream." • Complete: "Before a medicine works, it must _____ and then _____." Sentence Frame: "One piece of evidence from the module is _____."
15 min	Application	Tell students they are serving on a Medical Innovation Team. Present the challenge: "A disease is spreading through a community. Community leaders want to understand how medicine became effective enough to help people today. Your team has been asked to explain what had to happen for modern medicine to reach its current level." Remind students that all evidence and examples must come from the module. Provide sorting mats labeled: • Builds Medical Knowledge • Builds From Medical Knowledge Direct students to use evidence from the module to build and defend a model explaining how medicine improves over time. Students: Step 1: Build the Timeline of Medical Progress Review notes and evidence collected from the module. Identify examples related to pathology, documentation, sharing knowledge, and medical tools. Arrange examples in an order that makes sense based on the module evidence. Step 2: Create the Medical Progress Map



		Sort examples into Builds Medical Knowledge or Builds From Medical Knowledge. Discuss relationships between the examples. Determine which ideas belong at the beginning, middle, and end of the system. Step 3: Solve the Challenge Construct a cause-and-effect chain that explains how medicine became more effective over time. Use evidence from the module to support each part of the chain. Determine which factor played the greatest role in medical progress. Step 4: Defend Your Team's Explanation Present your medical progress map to another group. Compare explanations and evidence. Determine which explanation is most strongly supported by module evidence. Revise your explanation if needed. Sentence Frames: _____ helped build medical knowledge because _____. _____ improved because people knew more about _____. Because people _____, knowledge _____, which allowed _____, leading to _____ outcomes. The most important factor was _____ because _____. Answer Key: Acceptable Examples for Builds Medical Knowledge • Pathologists study disease. • Pathologists examine organs, tissues, cells, and microscopic images. • Ancient Egyptians recorded medical treatments and remedies. • Medical discoveries were documented and shared across generations. Acceptable Examples for Builds From Medical Knowledge • Medical tools improved over time. • Surgical instruments became more advanced. • Sterilization practices improved medical procedures. • Medical treatments became safer and more effective. Acceptable Cause-and-Effect Chains • Because people studied disease, knowledge increased, which allowed better tools and treatments to be created, leading to better health outcomes. • Because medical knowledge was recorded and shared, later generations could improve on earlier discoveries, which led to improved medical tools and safer procedures. Acceptable Conclusions • Recording and sharing knowledge is the most important factor because discoveries cannot improve medicine if others cannot learn from them. • Studying disease is the most important factor because medical knowledge begins with understanding disease. • Improved tools are important, but they depend on knowledge gained through studying, recording, and sharing information.
2 min	Reflection	How has your thinking changed about what determines how quickly a medicine works?
2 min	Career Connections	Healthcare professionals must decide both what medicine to use and how to administer it. Emergency responders, nurses, physicians, and pharmacists use knowledge of absorption and distribution to predict how quickly a treatment will work. Understanding these concepts helps them make decisions that improve patient outcomes in both routine and emergency situations.

