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Week 3: Cells & Genetics

Module 2: Specialized Cells: Receptors and Responses

Lesson: Why Your Body Reacts Before You Think

Lesson Overview

Students deepen their understanding of cells by learning how specialized cells detect stimuli and trigger rapid responses in the body. They use evidence to revise their initial ideas and explain how signals move through the body to produce actions.

Learning Targets

Explain how specialized cells detect changes in the environment.

Describe how signals travel from the body to the brain.

Explain why the body can react before conscious thinking.

Vocabulary

Specialized cell	a cell with a specific job
Receptor	a cell that detects changes or stimuli
Stimulus	a change that triggers a response
Signal	a message sent through the body
Response	the action the body takes

Materials

Module
Whiteboard or chart paper
Student notebooks

Instructional Notes

This lesson builds on the idea that cells control body function by introducing specialized cells that detect and respond to stimuli. Students often think body parts act independently. This lesson helps them understand the system: stimulus → receptor → signal → brain → response. Focus on helping students revise their thinking through evidence rather than providing explanations too early.

Learning Experience

8 min	Opening	Present the scenario: “You step on something sharp in the dark. Your foot pulls away immediately before you think about it.” Ask: “What made your body move so fast?” Add the constraint: “The movement happened before you consciously thought.” Have students explain their thinking first, then revise their ideas after discussion. Students: Write an initial explanation independently. Turn to a partner and discuss. Prepare to share with the class. Share 1–2 ideas with the group.
15 min	Module	**Focus**: How does the body detect something and respond before conscious thought? **Guiding Questions**: • What types of stimuli can the body detect? • What do specialized cells do? • How does information travel through the body? • How does the brain create a response? **Quick Checks**: • What sends information to the brain?
15 min	Application	Return to the original scenario. Display the sequence: Stimulus → Receptor → Signal → Brain → Response Direct students to explain what happened using the sequence and be ready to justify their reasoning. Students: **Step 1: Identify Information** Identify the stimulus. **Step 2: Connect to Learning** Work with a partner to identify which specialized cell detected the stimulus. **Step 3: Make a Decision** Arrange the steps in the correct order with a partner. **Step 4: Explain Reasoning** Write a complete explanation using the sequence. Sentence Frames: “When I stepped on ______, the ______ detected it.” “A ______ was sent to the ______.” “The brain caused my body to ______.” Share the explanation with another pair.
2 min	Reflection	What part of your explanation changed the most after learning how the system works?
2 min	Career Connections	Doctors and neurologists study how signals travel through the body to diagnose injuries and evaluate reflexes. Understanding how the body detects and responds to stimuli helps explain reaction time, injury prevention, and nervous system function. The same reasoning students used today is applied by health science professionals when investigating how the body responds to information from the environment.