Catch That Bus

Trace how body systems work together during a short run

7.4 "Obtain, evaluate, and communicate information explaining how cells, tissues, and organs of various systems of the human body work together for specific functions, including the circulatory, digestive, muscular, nervous, respiratory..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the steps that carry a signal from Maya's eyes to her leg muscles. Circle each sentence that describes a substance moving between body systems.

Maya's Run

1. Maya sees her bus turn the corner just as she leaves home. Light reflected from the bus enters her eyes, where visual cells in the retina detect it. These cells send signals through nerves to her brain. Her brain sends signals through other nerves to muscle cells in her legs. The muscle cells shorten, making muscles pull on bones at her hip, knee, and ankle joints. As Maya begins to run, the nervous, muscular, and skeletal systems work together to turn what she sees into movement.

2. Maya's leg muscles need a steady supply of oxygen as she runs. When she inhales, air reaches tiny air sacs in her lungs. Oxygen passes through the thin walls of the air sacs and nearby blood vessels into her blood. Red blood cells carry oxygen while her heart pumps blood through vessels toward her legs. Oxygen then moves from the blood into her muscle cells. Her lungs, heart, blood vessels, and muscles work together so the running muscles can keep getting the oxygen they need.

3. Maya also needs fuel. At breakfast, she ate toast. Her digestive system breaks the toast's starch into glucose, a simple sugar. Cells lining her small intestine absorb glucose into her blood. Her circulatory system carries it to muscle cells, which use glucose and oxygen to release energy for running. Those cells produce carbon dioxide as waste. Blood carries the carbon dioxide back to her lungs, where it moves from blood into the air sacs. Maya breathes it out. One short run links the digestive, circulatory, respiratory, nervous, muscular, and skeletal systems.

2 ANSWER WITH EVIDENCE

Use the passage

1. How does seeing the bus lead Maya to start running? Trace the signal and explain what her muscles do to her bones.

2. Trace oxygen from Maya's lungs to the cells that use it while she runs.

3. How do Maya's digestive and circulatory systems work together to supply her leg muscles with fuel?

4. Muscle cells produce carbon dioxide while Maya runs. How do two other body systems help remove it?

3 YOUR TURN

Your own words

Imagine you spot a puddle, jump over it, and land on the other side. In 4 to 5 sentences, explain how at least four body systems work together to help you spot the puddle, jump, and land. Describe what two kinds of cells do, and trace one substance between systems.

ANSWER KEY

Catch That Bus

GRADE 7 · 7.4

PART 1 · READ AND MARK

Underline the steps that carry a signal from Maya's eyes to her leg muscles. Circle each sentence that describes a substance moving between body systems. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How does seeing the bus lead Maya to start running? Trace the signal and explain what her muscles do to her bones.	**Visual cells detect light reflected from the bus and send signals through nerves to Maya's brain. Her brain sends signals through nerves to leg muscle cells, which shorten so the muscles pull on bones at her joints.**
2	Trace oxygen from Maya's lungs to the cells that use it while she runs.	**Oxygen passes from air sacs in the lungs through their walls and nearby blood vessel walls into the blood. Red blood cells carry it as the heart pumps blood toward the legs. Oxygen then moves from the blood into Maya's muscle cells.**
3	How do Maya's digestive and circulatory systems work together to supply her leg muscles with fuel?	**The digestive system breaks starch from toast into glucose. Cells lining the small intestine absorb glucose into the blood, and the circulatory system carries it to leg muscle cells.**
4	Muscle cells produce carbon dioxide while Maya runs. How do two other body systems help remove it?	**The circulatory system carries carbon dioxide in the blood from muscle cells to the lungs. It moves into the air sacs, and Maya's respiratory system removes it when she breathes out.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Visual cells in my eyes detect light reflected from the puddle and send signals through nerves to my brain. My brain sends signals to leg muscle cells, which shorten so my muscles pull on bones to lift me over the water. My lungs move oxygen into my blood, and my heart pumps blood toward my legs. Oxygen moves from the blood into my muscle cells, where it helps release energy. As I land, signals from my brain help my leg muscles bend my knees to absorb the impact.

Accept accurate chains that connect cells, organs, and systems, even if students use different wording. For the open task, check that the student explains the landing and traces a substance across systems, not just names systems.