Climb by Climb

Model how body parts work together during a hike

L.6.1.6 "Develop and use models to show relationships among the increasing complexity of multicellular organisms (cells, tissues, organs, organ systems, organisms) and how they serve the needs of the organism."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Circle one example each of a cell, tissue, organ, organ system, and organism in the lung model. Number your circles 1 through 5, from smallest level to largest.

What Helps Maya Climb?

1. At the start of a steep hike, Maya pauses to catch her breath. Air enters her nose, travels down her windpipe, and reaches her lungs. Each lung is an organ, a body part made of different tissues working together. The nose, windpipe, and lungs are parts of the respiratory system. This organ system brings oxygen from the air into Maya's body and removes carbon dioxide. Maya is an organism, a living thing whose body systems work together to meet her needs.

2. Deep inside each lung are millions of tiny air sacs. Thin lining cells cover the air sacs. Many lining cells together form epithelial tissue, a sheet that helps separate air from blood. This tissue is one part of a lung; blood vessels and other tissues are there too. Oxygen moves across the thin lining into nearby blood, while carbon dioxide moves the other way. Blood carries oxygen to cells throughout Maya's body. Those cells use oxygen to release energy from food.

3. As Maya climbs, her leg muscles work harder and need more energy. Her breathing becomes faster, moving more air through the respiratory system. At the same time, her heart pumps blood faster, helping carry oxygen to working muscles. A muscle contains muscle cells grouped into muscle tissue, along with other tissues that help it work as an organ. Muscles throughout her body make up the muscular system. The respiratory and muscular systems work together to help the whole organism climb.

2 ANSWER WITH EVIDENCE

Use the passage

1. How do lining cells form a tissue, and how does that tissue help Maya get oxygen?

2. Why is a lung an organ rather than just a sheet of epithelial tissue?

3. Trace oxygen's path from outside Maya to her leg muscles. Name the respiratory organs it passes through and explain what happens at the air sacs.

4. How do the respiratory and muscular systems work together to help Maya climb?

3 YOUR TURN

Your own words

Imagine that some of Maya's air-sac lining cells are injured. Draw a five-level arrow model showing a possible effect at each level, from cells to Maya as an organism, then add one sentence explaining why climbing might become harder.

ANSWER KEY

Climb by Climb

GRADE 6 · L.6.1.6

PART 1 · READ AND MARK

Circle one example each of a cell, tissue, organ, organ system, and organism in the lung model. Number your circles 1 through 5, from smallest level to largest. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How do lining cells form a tissue, and how does that tissue help Maya get oxygen?	**Lining cells together form epithelial tissue. Oxygen crosses this thin tissue into nearby blood.**
2	Why is a lung an organ rather than just a sheet of epithelial tissue?	**A lung contains epithelial tissue, blood vessels, and other tissues that work together.**
3	Trace oxygen's path from outside Maya to her leg muscles. Name the respiratory organs it passes through and explain what happens at the air sacs.	**Air passes through the nose and windpipe into the lungs. Oxygen crosses the air-sac lining into blood, which carries it to the leg muscles.**
4	How do the respiratory and muscular systems work together to help Maya climb?	**The respiratory system brings in oxygen. Blood carries it to working muscles, whose cells use it to release energy from food.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Injured lining cells (cells) → weakened epithelial tissue (tissue) → less oxygen crosses into blood in a lung (organ) → the respiratory system supplies less oxygen to blood (organ system) → Maya tires sooner (organism). Her leg muscles may receive less oxygen to help release energy from food.

Accept other reasonable effects that follow through all five levels. Predictions should be stated as possible effects, since the passage does not establish how much injury occurred.