Bones in Motion

Trace how the skeleton grows and changes over time.

HAP.3.a "Obtain, evaluate, and communicate information describing the growth and development of the skeletal system."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the sentences that explain how a long bone gains length, and circle phrases showing how bone can change without gaining length.

What Changes as Bones Grow?

1. When a baby grips a finger, its skeleton is already supporting movement, but many parts are not fully hardened. Some developing bones begin as flexible cartilage. In a long bone, such as the thighbone, cells gradually replace much of this cartilage with bone tissue, a process called ossification. Near each end, a band of cartilage remains: the growth plate. Cartilage cells there divide and enlarge, while bone replaces older cartilage on the shaft side. This sequence increases the bone's length. The ends of a long bone do not simply stretch like rubber; new tissue is made as the child grows.

2. During childhood, growth plates keep adding length, but the rate is not constant. Hormones help produce a growth spurt during puberty. Later, the plates are replaced by bone, and most people stop gaining height through long bone growth. The timing varies among individuals and among bones. A bone can also become wider as cells add tissue to its outer surface. At the same time, other cells remove older bone tissue inside it. These coordinated changes help shape the growing skeleton and adjust it to the forces placed on it. A child's bones are developing in more than one direction.

3. Imagine a poster claiming, 'After the growth plates close, bones are finished changing.' That conclusion confuses length with ongoing maintenance. In adults, cells still remove old bone and build new bone, a process called remodeling. Remodeling helps repair tiny areas of damage and can change bone strength in response to repeated activity. Nutrition matters too: calcium supplies a mineral used in bone, and vitamin D helps the body absorb calcium. Neither a single food nor a workout can guarantee a certain height. To judge claims about skeletal development, ask which change is being described: length, width, or the condition of existing bone.

2 ANSWER WITH EVIDENCE

Use the passage

1. How does cartilage at a growth plate become part of a longer bone? Describe the sequence from the passage.

2. How can a growing bone change in width as well as length? Identify the different processes involved.

3. What change in the growth plates helps explain why most people stop gaining height through long bone growth?

4. Evaluate the poster's claim that bones are finished changing after growth plates close. Use two details from the passage.

3 YOUR TURN

Your own words

A younger athlete says, 'Lifting weights makes bones grow longer even after puberty.' Write a 70 to 90 word reply that distinguishes bone length from bone strength. Explain how long bones gain length during youth, what changes in the growth plates later, and how adult bones can still respond to activity.

ANSWER KEY

Bones in Motion

PART 1 · READ AND MARK

Underline the sentences that explain how a long bone gains length, and circle phrases showing how bone can change without gaining length. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How does cartilage at a growth plate become part of a longer bone? Describe the sequence from the passage.	**Cartilage cells divide and enlarge at the growth plate. Bone replaces older cartilage on the shaft side, increasing the bone's length.**
2	How can a growing bone change in width as well as length? Identify the different processes involved.	**Growth plates add length. Cells add tissue to the bone's outer surface, making it wider, while other cells remove older tissue inside.**
3	What change in the growth plates helps explain why most people stop gaining height through long bone growth?	**The growth plates are replaced by bone, so they no longer add length to long bones.**
4	Evaluate the poster's claim that bones are finished changing after growth plates close. Use two details from the passage.	**The claim is incorrect. Adult bone cells still remove old tissue and build new tissue; remodeling helps repair small areas of damage and can change bone strength.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Lifting weights does not make adult long bones keep getting longer. During youth, cartilage cells at growth plates divide and enlarge, and bone replaces older cartilage near the shaft. This process adds length. Later, growth plates are replaced by bone, so most people stop gaining height through long bone growth. Adult bones are still active, though. Cells remove old bone and build new bone during remodeling. Repeated activity can affect bone strength, which is different from increasing a bone's length.

Accept accurate descriptions of cartilage being replaced by bone and of adult remodeling. For the open response, check that students distinguish changes in length from changes in strength without claiming that exercise guarantees a particular result.