# The Recovery Test

Investigate how pulse changes after activity

**HS-AP1-1** "Plan and conduct and investigation to provide evidence that feedback mechanisms maintain homeostasis in humans."

NAME _____ DATE _____

## 1 READ AND MARK

Read it twice

**YOUR JOB** Circle the words that tell what the student measured and when, underline the table readings that show a return to the resting value, and box the sentence that describes how feedback changes heart rate.

### After the Stairs

1. A student wonders how the body responds after a short climb up school stairs. She measures her pulse for 30 seconds while seated, then doubles the count to estimate beats per minute. She climbs one flight of stairs at a steady pace and measures again immediately and at set times while seated during recovery.

**PULSE DURING STAIR-CLIMB RECOVERY**

| Time | Pulse (beats per minute) |
|---|---|
| Before climbing, seated | 72 |
| Immediately after climbing | 112 |
| 1 minute after climbing | 96 |
| 2 minutes after climbing | 80 |
| 3 minutes after climbing | 72 |

2. The table shows results from one trial. Her pulse rises after climbing and returns to its resting value within three minutes. Working muscles need more oxygen and nutrients, so an increased heart rate can help move more blood to them. During recovery, demand drops, and the heart no longer needs to beat as quickly.

3. Feedback helps adjust heart activity as conditions change. Information about the body's state reaches the brain, which sends signals through nerves that alter heart rate. The pulse measurements show a pattern consistent with this regulation, but they cannot identify the signals involved. To strengthen the investigation, the student could repeat the climb on other days under the same conditions.

## 2 ANSWER WITH EVIDENCE

Use the passage

1. What activity changed between the first two pulse measurements, and how did the student measure pulse?

2. Which three pulse readings show a rise followed by a return to the resting value? Include when each was taken.

3. Using the passage, explain how feedback could change heart rate during recovery.

4. Why do these pulse readings not identify the signals controlling heart rate? What step in the passage could strengthen the investigation?

## 3 YOUR TURN

Your own words

Plan and carry out a breathing-rate recovery test: count your breaths for 30 seconds while seated, immediately after one minute of walking in place, and after two minutes seated. In five sentences, give your prediction, report the three counts, name one condition to keep the same in a repeat trial, and explain whether your results support a return toward rest without claiming they identify a specific signal.

ANSWER KEY

# The Recovery Test

HIGH SCHOOL · HS-AP1-1

## PART 1 · READ AND MARK

Circle the words that tell what the student measured and when, underline the table readings that show a return to the resting value, and box the sentence that describes how feedback changes heart rate. Accept any marking that follows this job and points at the right text.

## PART 2 · ANSWERS

| # | QUESTION | ANSWER |
|---|---|---|
| 1 | What activity changed between the first two pulse measurements, and how did the student measure pulse? | **She climbed one flight of stairs. She counted her pulse for 30 seconds and doubled the count to estimate beats per minute.** |
| 2 | Which three pulse readings show a rise followed by a return to the resting value? Include when each was taken. | **Her pulse was 72 beats per minute before climbing, 112 immediately after, and 72 three minutes after climbing.** |
| 3 | Using the passage, explain how feedback could change heart rate during recovery. | **Information about the body's state reaches the brain, which sends signals through nerves that alter heart rate as the body's demand drops.** |
| 4 | Why do these pulse readings not identify the signals controlling heart rate? What step in the passage could strengthen the investigation? | **Pulse readings show how heart rate changed, not which signals caused the change. Repeating the climb on other days under the same conditions could strengthen the evidence.** |

## PART 3 · YOUR TURN (SAMPLE ANSWER)

I predicted that my breathing rate would rise after walking and then move back toward its resting rate. I counted breaths for 30 seconds while seated, immediately after one minute of walking in place, and after two minutes seated. My counts were 8, 13, and 9 breaths, in that order. In a repeat trial, I would keep the walking time at one minute. The drop from 13 to 9 supports a return toward rest, but my counts do not identify the signal that changed my breathing rate.

Accept different breathing counts and conclusions that match the student's reported data. A return toward rest is evidence consistent with feedback, not proof of a particular pathway.