Team of Teams: Evidence That Body Systems Interact

Teacher		**Class**	Grade 6
Subject	Science	**Topic**	Human body systems
Date		**Room**	
Lesson length	60 minutes	**Country**	United States

Students learn the body is interacting subsystems built from cell groups. They collect breath and pulse data and write a claim with evidence.

Curriculum links

- Investigate how the body is a system of interacting subsystems composed of groups of cells [1]
- In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions [2]

Learning objectives

- Students will order cells, tissues, organs and systems to show body organization.
- Students will use breath and pulse data to argue two systems interact.
- Students will explain that body is interacting subsystems made of cell groups.

Success criteria

- I can put cell, tissue, organ, and system in order.
- I can use body data as evidence that systems interact.
- I can write a claim that the body is interacting subsystems.

What students already know

Ask: When you run fast, what changes in your breathing, heartbeat, and legs? Take 3-4 quick answers to hear lungs, heart, and muscles mentioned.

Key words

cell	tiniest living building block that carries out life jobs [3]
tissue	many similar tiny living blocks joined to do one job together [3]
organ	body part made from two or more joined block-groups with a special job [3][4]
system	team of body parts that work together to do a large life job [4]

Materials

- clock with second hand
- data sheet with Before and After boxes for breaths and pulse
- pencils
- Slides 1, 2, 4, 5, 7, 8, 9, 10, 12
- Video clip 1 How body systems interact (0:00–2:35)
- Worksheet Tasks C, D, E printed for pairs

Before the lesson

- Print Worksheet Tasks C, D, E for pairs and data sheets with Before and After boxes
- Load Slides 1, 2, 4, 5, 7, 8, 9, 10, 12 and test Video clip 1 (0:00–2:35) with sound
- Clear floor space for marching in place and check clock with second hand works
- Set room in pairs facing board with pencils ready

Lesson outline

0–7 min **Starter** 7 min · Whole class

Hook interest in exercise and recall that lungs, heart, and muscles all respond.

YOU DO

1. Show Slide 1: Your Body: A Team of Teams - How cells team up to keep you alive.
2. Say the hook: Let's test what happens to your breathing and heartbeat when you move for one minute.
3. Show Slide 5 question: You sprint for the bus — what do your lungs, heart, and leg muscles all do? Have partners tell each other in 60 seconds.
4. Collect 3 quick ideas and link to Slide 2 statement: You stay alive because groups of cells form teams that help each other.

STUDENTS DO

1. Listen to hook and look at Slide 1 title.
2. Turn to partner and answer Slide 5 sprint question.
3. Share ideas about breathing faster, heartbeat faster, and legs working.

Say: Let's test what happens to your breathing and heartbeat when you move for one minute. You sprint for the bus — what do your lungs, heart, and leg muscles all do? Talk with your partner and be ready to share one change you expect.

Ask: What do you expect to happen to breathing and heartbeat if you march for one minute? (Both get faster because activities like running, fast walking, or dancing make breathing faster and heart rate faster [21].) · Why might lungs, heart, and leg muscles all need to act at the same time? (Because no part from the smallest cell to a complete system works in isolation and all function together for well being [7].)

Check understanding: Thumbs up if you can name two body changes during exercise. If many thumbs down, take one more pair share before moving on.

Support: Give sentence starter: When I move, my breathing ___ and my heart ___. **Stretch:** Ask: What evidence would prove two systems helped each other, not just worked alone?

Use: Slides 1, 5

7–19 min **Teaching** 12 min · Whole class

Explain how cells build tissues, organs, and interacting systems.

YOU DO

1. Show Slide 2 big idea and read it together.
2. Show Slide 4 cards for Cell, Tissue and organ levels and explain that tissues are many similar cells together [3] and an organ is several different tissues together so they can perform a special function [3].
3. Model a ladder on the board: cells combine to form tissues, tissues combine to form organs, organs combine to form organ systems, and organ systems combine to form organisms [4].
4. Show Slide 7 photo and explain: Blood picks up oxygen in the lungs and drops it at every cell, then carries carbon dioxide back to breathe out.

STUDENTS DO

1. Repeat levels in order with the teacher and point to Slide 4 cards.
2. Copy the 5-step ladder: cell to tissue to organ to organ system to organism.
3. Explain to partner in one sentence why higher levels are built from lower levels.

Say: You stay alive because groups of cells form teams that help each other. Tiny blocks team up into a tissue, different tissues team up into a body part, body parts team up into a system, and all the systems make you. Systems must help each other to keep every cell alive.

Worked example: Ladder example: muscle cells work together as muscle tissue [3]. The stomach as an organ joins muscle, connective, epithelial, and nervous tissues [3]. Organs that work together are grouped into organ systems [4]. The heart and lungs work together to deliver oxygen and remove carbon dioxide [8], and muscle and skeletal systems act together to move the body [10].

Ask: How is a tissue different from an organ? (A tissue is many similar cells working together, while an organ joins two or more tissue types for a special job [3][4].) · What makes a group of organs a system? (An organ system is a group of organs that work together to perform major functions for the body [4].)

Check understanding: Mini whiteboards: write the five levels in order. Reteach with Slide 4 cards if order is mixed up.

Support: Give a starter strip with the five level names in order and picture cards to match in order. **Stretch:** Ask why sorting organs into systems can be tricky when most organs contribute to more than one system [4].

Use: Slides 2, 4, 7

19–39 min **Main activity** 20 min · Pairs

Collect breath and pulse evidence that respiratory and circulatory systems interact.

YOU DO

1. Remind safety: clear space, supportive shoes, walk not run, stop and sit and tell teacher if dizzy, short of breath, or sore.
2. Model counting breaths for 30 seconds sitting and feeling pulse at the neck, then record in Before boxes.
3. Show Slide 8 and play Video clip 1 How body systems interact (0:00–2:35). Tell students to spot two systems working together during exercise.
4. Time 1 minute of marching in place, then time 30 seconds for After counts and recording.

STUDENTS DO

1. Partner 1 counts breaths while Partner 2 watches clock, then switch and feel pulse.
2. March in place for 1 minute with space, then recount breaths and pulse for 30 seconds.
3. Record Before and After numbers on data sheet and underline what changed.

Say: Count your breaths for 30 seconds while sitting and write it down. Feel your pulse at your neck. Then we will march in place for one minute and count again. Clear space around you, do not bump others, and stop and sit if you feel dizzy or sore.

Worked example: Example data: Student A counted 8 breaths in 30 seconds sitting and a steady pulse. After 1 minute marching, 14 breaths in 30 seconds and a faster, stronger pulse. The circulatory and respiratory systems supply cells with materials and remove waste [2], and red blood cells spread oxygen from lungs through the body where it is used in production of energy [21].

Ask: What happened to your numbers after movement? (Breaths and pulse went up because breathing and heart rate speed up with activity [21].) · How do those numbers show two systems interacting? (Lungs take in oxygen and push out carbon dioxide while blood flow delivers oxygen and nutrients and removes waste, and heart and lungs work together to deliver oxygen and remove carbon dioxide [5][8].)

Check understanding: Scan data sheets for Before lower than After. If numbers missing, do a 15-second recount and double it.

Support: Let students count for 15 seconds and double the number, and give them a table with boxes for before and after [21]. **Stretch:** Ask students to predict what would happen after 3 minutes of rest and explain the recovery using oxygen delivery.

Use: Slide 8, Video clip 1 (0:00–2:35)

39–52 min **Argument writing** 13 min · Pairs

Write a claim with evidence that the body is interacting subsystems made of cells.

YOU DO

1. Show Slide 9: In pairs, write a claim with evidence that the body is interacting subsystems made of cells.
2. Model claim frame on board: I claim ___ because my evidence is ___ which shows ___.
3. Hand out Worksheet Tasks D and E. Pairs read the sprint story, list what changed, and pick the claim with the best evidence of interaction.
4. Circulate, prompt to link breath and pulse numbers to cell needs.

STUDENTS DO

1. List Before and After changes from data sheet on Task D.
2. Write one claim plus two pieces of evidence and one sentence linking evidence to interaction.
3. Do Task E: compare three claims and circle the one with the best evidence.

Say: In pairs, list what changed when you moved: breath, heartbeat, and muscles. Then write one claim that the body is interacting subsystems made of cells, and add your numbers as evidence. Use Task E to pick the claim with the best proof of teamwork.

Worked example: Worked claim: I claim the respiratory and circulatory systems must interact because my evidence is 8 breaths sitting to 14 breaths after marching with faster pulse, which shows blood picks up oxygen in the lungs and drops it at every cell, then carries carbon dioxide back to breathe out.

Ask: Which claim has the best evidence of interaction? (The one that cites both breath and pulse change and explains that heart and lungs work together to deliver oxygen and remove carbon dioxide [8].) · How does your evidence connect to groups of cells? (The body is a system of multiple interacting subsystems made of groups of cells forming tissues and organs for particular functions [2].)

Check understanding: Collect one claim per pair on mini whiteboards and check for claim plus numbers plus link. Model again if link is missing.

Support: Provide frames: I claim ___ because ___ shows ___, with pre-highlighted numbers and pictures. **Stretch:** Ask pairs to add why the solo-system idea fails even with their example.

Use: Slide 9, Worksheet Tasks D, E

52–60 min **Plenary** 8 min · Whole class

Confirm that cells form interacting tissues, organs, and systems.

YOU DO

1. Show Slide 10 key words and review cell, tissue, and organ meanings together.
2. Show Slide 12 True or false statements and do Worksheet Task C tick true or false with evidence.
3. Return to Slide 2 big idea and have two pairs read their claim with evidence aloud.
4. Give exit ticket on paper.

STUDENTS DO

1. Say key words with meanings from Slide 10.
2. Vote true or false for Slide 12 and Task C and give evidence.
3. Complete 3-question exit ticket on their own.

Say: Cells form tissues, organs, and systems that depend on each other. The body is a system of interacting subsystems made of cell groups. Show with thumbs true or false and tell what evidence proves it.

Worked example: True or false answers: Cells form tissues, organs, and systems that depend on each other - True. The body is a system of interacting subsystems made of cell groups - True because higher levels are built from lower levels [4]. Lungs take in oxygen - True because lungs handle oxygen intake and carbon dioxide removal [5].

Ask: Can the heart work all by itself? (No, because heart and lungs work together to deliver oxygen and remove carbon dioxide and no part works in isolation [7][8].) · Why is the body called a system of subsystems? (Because groups of cells form tissues and organs that are specialized for particular functions and systems interact [2].)

Check understanding: Tally true or false votes and ask for evidence. Reteach ladder if votes split.

Support: Give reference sheet with each system paired to one organ and one picture to match picture to picture first. **Stretch:** Ask to trace a chain through three systems instead of two and defend the order.

Use: Slides 10, 12, Worksheet Task C

Common mistakes

Mistake	How to spot it	How to fix it
Thinks the heart or lungs work alone.	Claim mentions only one organ with no link.	Remind that heart and lungs work together to deliver oxygen and remove carbon dioxide and no part works in isolation [7][8].
Mixes up cell, tissue, organ, and system order.	Ladder places organ before tissue or system before organ.	Rebuild that higher levels are built from lower levels: cells to tissues to organs to organ systems [4], with tissues as similar cells together [3].

Support

- Starter strip with level names in order and picture matching with word bank
- 15-second counts doubled with boxed Before and After table
- Sentence frames for claim plus evidence with highlighted numbers

Stretch

- Explain why one organ can belong to more than one system in function
- Predict 3-minute rest recovery using oxygen delivery and defend order through three systems

For the LSE or teaching assistant

Stay with target pairs during counts and writing. Help find pulse, scribe numbers, prompt claim frame, and check ladder order with picture cards.

Safety

- Clear floor space and wear supportive shoes. Stop, sit, and tell the teacher if dizzy, short of breath, or sore. Walk, do not run into others.

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Check for understanding

Question	Answer
Put in order: organ, cell, system, tissue.	cell, tissue, organ, system
Give one piece of evidence that respiratory and circulatory systems interact during exercise.	Breaths and pulse rose together to deliver oxygen and remove carbon dioxide
Use evidence to finish: The body is interacting subsystems because ___.	Groups of cells form tissues and organs and heart and lungs work together to keep cells supplied

Homework

Write two sentences explaining one body teamwork example with one evidence detail.

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