

1. Essential Element

Activity/Lesson Title: Cells and Living Things

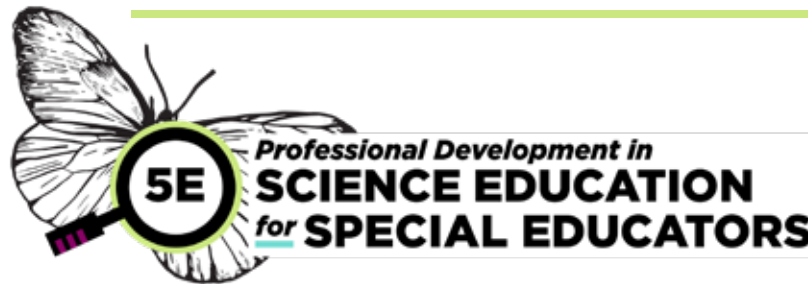
EE.MS.LS1-3: Make a claim about how a structure (e.g., organs and organ systems) and its related function supports survival of animals (circulatory, digestive, and respiratory systems).

Teacher: Ashley

Grade Level: Grades 6-8

Student: Lizbeth

Level: Target



2. Science and Engineering Practice

SEP 7: Engaging in Argument from Evidence

SEP description: Supports students in using scientific claims supported by evidence to support or refute an explanation or a model for a phenomenon

3. Disciplinary Core Idea

Structure and Function

Core Idea description: 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.

4. Crosscutting Concept

Systems and System Models

Concept Description: Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems

5. Linkage Level Descriptors

Initial: Recognize major organs of animals.

Precursor: Use a model to demonstrate how organs are connected in major organ systems.

Target: Make a claim about how a structure (e.g., organs and organ systems) and its related function supports survival of animals (circulatory, digestive, and respiratory systems).

6. Student's Typical Accessibility Supports

- Graphic organizers
- Picture symbols
- Magnetic boards
- Images and models on an interactive whiteboard
- 3D models of the human body

7. Student Prior Experiences, Prior Knowledge

- The student loves parties.
- The student loves fruit.
- The student likes to be active with her friends.
- The student knows that some organs work together (e.g., eyes and ears take in information that help us function).
- The student has prior knowledge that different parts make up the whole person she can see.

8. Phenomenon to Explore

Question: How do our bodies react during exercise?

9. Possible Alternative Conceptions

Some students may think (incorrectly) that

- The body is one unit since that is how they observe it on the outside (i.e., the body is a whole with no subsystems).
- Systems and organs work alone and don't interact with other organs or systems.
- Only the lungs are part of breathing. Students may not realize there are other organs involved such as the diaphragm.
- Digestion only occurs in the stomach. Digestion actually occurs starting with the mouth and going through the intestines.

10. UDL Options and Solutions to Potential Barriers

- Engage students in games that raise their heart rate, which allows all students to participate (e.g., tag in a swimming pool with buddies; half-court basketball).
- Selecting which organs to focus on and expanding or reducing that list based on individual students.
- Select appropriately complex phenomena and questions.
- Use a variety of materials (e.g., different images, models, videos of organs, body systems) to demonstrate the concept.

Ensure all materials are in an accessible form.

- Include engaging videos and texts that show students simulations of organ systems working together (Options for Language & Symbols).
- Provide graphic organizers and templates for organizing and displaying data from lessons, such as placing body parts on a template or matching organs to their functions (Options for Expression & Communication).
- Provide opportunities, such as drawing and painting, to allow students to describe or portray the different organs or systems of the body (Options for Expression & Communication).
- Use a data chart or checklists of steps to allow students to monitor the steps within the experiment (Options for Executive Functions).

11. Engage

Think

- How can I make sure to access students' prior learning?
- How can I use the CCC to connect everyday language with scientific language of the phenomenon?
- How can I support student participation by scaffolding the SEP?

Teacher Will

- Ask students to respond to questions about the body's major systems in the context of exercising.
- Ask students to complete activities (e.g., listening to their hearts with a stethoscope) to help them think about how their bodies react as they exercise.

Students Will

- Identify the systems and organs that they use while exercising.
- Respond to questions about their bodies' reactions to physical activities.

12. Explore

Think

- What is difficult or inaccessible about the phenomenon, and how can I make it more accessible in the Explore phase?
- How can students collect data in a way that helps answer a scientific question?
- How can I stress students' careful observation and asking good questions vs. looking for only the "right answer"?

Teacher Will

- Ask students to think about how bodies react to exercise (using the example of playing a game of Tag).
- Introduce vocabulary (organs, heart rate, breathing rate).
- Lead students in movements or a game that increases their heart rate and breathing rate.
- Have students identify what body parts are in use, determine how those organs are changing, and gather data about heart rates and breathing rates.

Students Will

- Move to increase their heart and breathing rates (simulating or playing Tag).
- Make observations and gather data about how their bodies react to exercise.
- Use a data chart to list body parts used and how those body parts changed.

13. Explain

Think

- How can I help students connect science topics, phenomena, data, and everyday experiences? How can I help my students differentiate everyday language from scientific language? What reasoning helps students see or explain the invisible?

Teacher Will

- Ask students to describe what is occurring in their bodies as they exercise, play a physical game, or move.
- Support students with needed vocabulary.
- Assist students in using data to describe how organs in their bodies (heart/circulatory system and breathing/respiratory system) change after playing a physical game.

Students Will

Complete a CER Statement

Claim: Our bodies have organs that change and support us as we move or exercise.

Evidence:

- » Data I gathered showed that my heart rate went up after playing Tag.
- » Data also showed that my breathing rate went up after playing Tag.

Reasoning: My heart and lungs changed as I moved to support me in exercising.

14. Elaborate

Think

- How can I enrich or extend student ideas? Are there related science concepts or processes that would support student learning?

Teacher Will

- Have students think about what other organs in their digestive system support their bodies as they move.
- Assist students in creating a graphic organizer that groups different organs into systems and identifies what they do to support movement.

Students Will

- Extend what they learned about heart rates and breathing rates to think about other organs in their bodies that support movement.
- Use a graphic organizer to group organs into body systems.

15. Evaluate

Think

- What do I need to see or hear from my students that assures that they have learned the science content? What information must I gather to inform my teaching as I move through the lesson?

Teacher Will

- Monitor students' responses to questions during the lesson; adapt the lesson as needed to address student ideas; administer a summative assessment.

Students Will

- Respond to questions posed by the teacher, make measurements and observations, organize data they gather, complete a CER statement using data as evidence, and complete required assessments.