

# STEAM & Sports

## Lesson 5 - The Human Body in Motion

# The Human Body in Motion

## Concept

The lesson plan "The Human Body in Motion" explores the interconnectedness of the human body systems—circulatory, respiratory, and muscular—during physical activity. Students engage in hands-on activities to understand how these systems work together to support movement and maintain health.

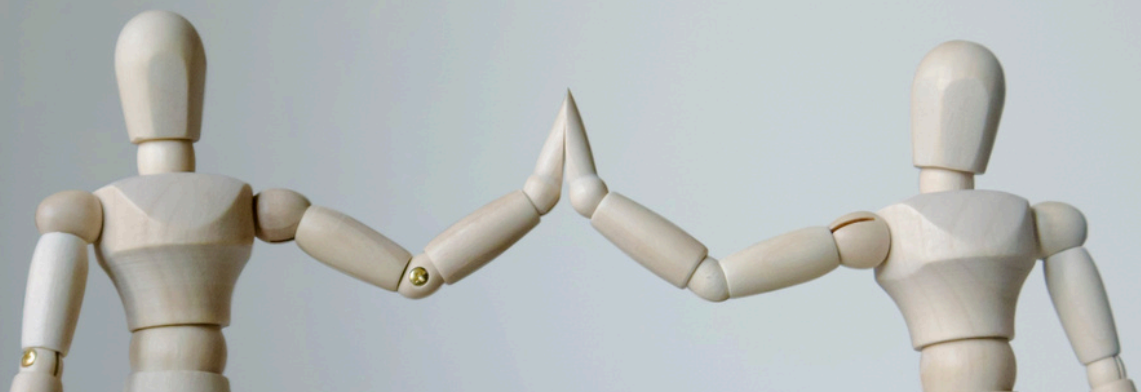
## Learning objectives and Outcomes

### Upon completion of this lesson, students will:

- Explain how body systems work together to support movement
- Understand the roles of the circulatory and respiratory systems during physical activity.
- Measure and analyze changes in heart rate and breathing rate before, during, and after exercise.
- Learn and use vocabulary related to human anatomy, including terms like heart rate, lungs, oxygen, blood vessels, diaphragm, and muscles.
- Write a descriptive paragraph explaining how body systems interact during physical activity.
- Explain benefits of physical activity for physical and mental health

### Students will be able to:

- Analyze and articulate the specific roles of the circulatory and respiratory systems during physical activity, detailing how each system contributes to overall performance.
- Demonstrate improved ability to measure and interpret heart rate and breathing rate data.
- Enhance vocabulary related to human anatomy and practice descriptive writing.



# Educational standards in connection with sports

This lesson plan integrates physical education (Body awareness, Muscular and cardiovascular development), Biology (respiratory, cardiovascular and muscular systems), and language (vocabulary, creative writing). It follows the 5E instructional model, engaging students in active learning and cross-disciplinary connections through regular exercise

## **1. Physical Education:**

Body awareness: Recognizing the body and its possibilities

Muscular and cardiovascular development: Increasing strength, endurance, and aerobic capacity.

Regular exercise: Understanding the benefits of physical activity for physical and mental health

## **2. Natural Sciences:**

Biology - Human body: Explore the human circulatory and respiratory systems and their functions during exercise.

## **3. Language:**

Clarity and Coherence: Mastering logical and organized writing.

Creative Voice: Developing originality and self-expression in text.

## This lesson includes elements of these school subjects

1. Physical Education
2. Natural Sciences: Biology
3. Language

## Timeframe

The expected total duration of the lesson is 90 minutes

## Students Age

11-13 years

## Material needed

1. Diagrams of the circulatory and respiratory systems
2. Vocabulary list with anatomical terms
3. Exercise equipment (e.g., jump ropes, stopwatches, app health )
4. Writing materials (notebooks, pens)
5. Whiteboard and markers

## Short description of the content

This lesson plan explores how the human body functions during physical activity by focusing on the interaction of the circulatory, respiratory, and muscular systems. Students engage in hands-on activities such as measuring heart rate and breathing rate before and after exercise, observing how muscles work during movement, and creating diagrams to illustrate body system interactions. The lesson also incorporates vocabulary building and descriptive writing to enhance understanding and communication of scientific concepts. Through active participation, students learn about the importance of exercise for body health and develop a deeper appreciation for how their body systems work together to support motion.

## Sequence of Lesson

### 1. Engage (10 minutes)

Activity: "Feel Your Pulse"

Students perform a light warm-up (e.g., jogging in place or stretching).

Afterward, they locate their pulse (on the wrist or neck) and measure their resting heart rate for 30 seconds; or they can use some some phone

The teacher asks guiding questions:

- "How does your heart feel right now?"
- "What do you think happens to your heart when you start moving faster?"

This activity introduces the connection between exercise and the circulatory system.

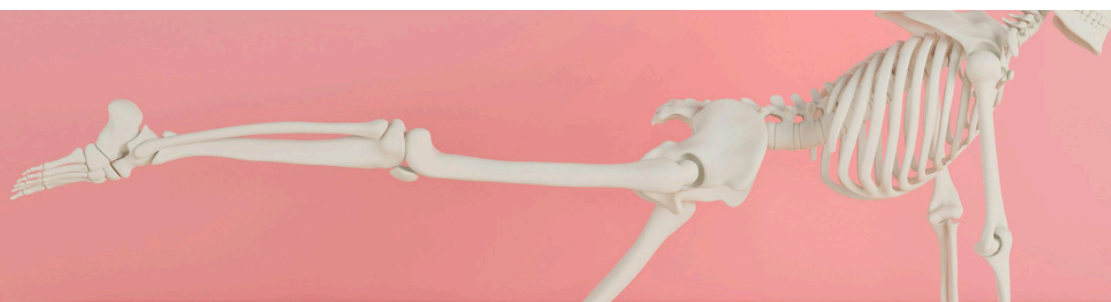
### 2. Explore (20 minutes)

Activity: "Exercise and Body Systems Exploration"

Divide students into small groups. Each group rotates through three activity stations:

- Jumping Jacks Station: Students perform jumping jacks for one minute, then measure their heart rate and breathing rate immediately afterward.
- Deep Breathing Station: Students practice slow, deep breathing exercises while observing how their chest expands and contracts.
- Stretching Station: Students stretch their arms and legs while discussing how muscles feel during movement.

At each station, students record observations about how their bodies respond to each activity (e.g., changes in heart rate, breathing, or muscle tension).





### 3. Elaborate (35 minutes)

Activity: "How Our Bodies Work During Exercise"

The teacher uses diagrams of the circulatory and respiratory systems to explain:

- How the heart pumps blood faster during exercise to deliver oxygen to muscles.
- How lungs work harder to take in oxygen and remove carbon dioxide.
- The role of muscles in movement and how they require oxygenated blood to function efficiently.

Introduce key vocabulary terms such as heart rate, lungs, oxygen, blood vessels, diaphragm, muscles, and energy.

Activity: "Create a Movement Map of the Body"

Students reflect on their recorded data from the exploration activities and connect it to the scientific explanation.

- In pairs, students create a diagram of a human body on large paper. They label: The heart, lungs, major muscles, and blood vessels.
- Arrows showing how blood flows from the heart to muscles during exercise.
- Labels describing what happens during physical activity (e.g., "Heart beats faster," "Muscles contract").

Once complete, students write a short paragraph explaining how the body systems work together during exercise using at least five new vocabulary words.

### 4. Evaluate (15 minutes)

Activity: "Present Your Findings"

Each pair presents their movement map to the class, explaining how exercise affects the circulatory, respiratory, and muscular systems.

The teacher provides feedback on their use of vocabulary and understanding of body systems.

Reflection Activity:

- Students answer reflection questions in their notebooks:
- "What surprised you about how your body works during exercise?"
- "Why is it important to understand how your body responds to physical activity?"

### Extend (20 minutes)

Students explore the importance of physical activities for their health and design their own weekly fitness plan tailored to their interests and goals. The plan should include:

- At least one activity for cardiovascular health (e.g., brisk walking for 30 minutes).
- One activity for strength training (e.g., bodyweight exercises twice a week).
- A flexibility routine (e.g., stretching for 10 minutes daily).

Encourage students to include rest days and activities they find enjoyable to ensure sustainability.

# Lesson Developer

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## Tips for age group differentiation (for older/younger kids than indicated in the lesson)

### Younger students:

**Movement and Body Awareness through Play:** Use simple instructions and familiar body parts (e.g., "Simon says touch your nose,") Demonstrate and participate with the children. For example, walk like a bear, hop like a frog.

**Storytelling and Role Play:** Read a picture book about the body, pausing to point out and discuss each part. Set up a pretend doctor's office with toy stethoscopes and bandages. Let children take turns being the doctor and patient.

**Body Tracing:** Have children lie on large paper and trace their outlines. Let them color and label simple body parts. **Simple Science Experiments:** Use a simple stethoscope or just your hand to feel heartbeats after running in place.

### Older students:

**Data Collection and Analysis:** Instead of simple movement or measurement tasks, older students can be challenged to design experiments, collect more sophisticated data (such as reaction times, force, or energy expenditure), and analyze results using statistical tools or graphing software.

### Critical Thinking and Reflection

**Reflective Writing:** Ask students to reflect on their learning experiences, analyze the effectiveness of their experiments or designs, and suggest improvements.

**Interdisciplinary Connections Cross-Curricular Projects:** Link STEAM and sports activities to other subjects, such as health science, physics, or environmental studies, by exploring topics like energy transfer in movement, the impact of nutrition on performance, or the environmental footprint of sports events.

## To which SDG(s) does the lesson relate most



**SDG 3:** Ensure healthy lives and promote well-being for all at all ages.



**SDG 4:** Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

## What Inclusivity and Accessibility measures can or should the teacher take for this lesson

To ensure inclusivity and accessibility in the “STEAM and Sports: The Human Body in Action” lesson, teachers should adapt movement and physical activities by providing adaptive equipment (such as larger balls or lower nets) and allowing alternate movements for students with mobility or coordination challenges, while also considering sensory needs like offering noise-canceling headphones or quiet zones for those sensitive to loud environments. During data collection and STEM experiments, teachers should offer multiple ways to record and measure (like digital devices or tactile tools) and assign flexible group roles so all students can contribute meaningfully. Creative and group projects should allow students to express themselves through various formats—drawing, speaking, or digital media—and use accessible materials for those with fine motor difficulties. Clear, multi-modal instructions (verbal, visual, and written) and visual schedules help all students understand and anticipate activities, while the learning environment should be physically accessible and safe for everyone, with individualized safety plans as needed. Assessment should be flexible, focusing on effort and progress, and celebrating all forms of participation to foster a positive, inclusive classroom experience



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