

Muscles & Movement

Muscle Machine Yard with Pulseling

Learning target

Explain how muscles and bones work together.



Before you begin

Use the reference page and discussion prompts on their own, or open the optional browser adventure. No earlier lesson or physical kit is required.

For online play: use an internet-connected current browser with local storage enabled. Read the three-part Gemling briefing, answer the quick check, and apply the evidence at three checkpoints. Retry feedback supports review; results are not a secure test or gradebook.

Use for teacher-led review, science centers or partner practice. Independent readers may need support with the vocabulary below. The design target is grades 3-5; choose support based on the learner.

Vocabulary and concepts to discuss

Muscles pulling; joints; muscles working together; movement

Open Muscle Machine Yard - direct lesson link

Scan the QR code or use the clickable link. This guide is usable offline; the adventure runs on an external educational website.



Muscles & Movement - key ideas

1. The first clues

Muscles can contract, becoming shorter and pulling on structures. Muscles work with bones and joints to produce many movements.

2. How the clues connect

Muscles often work in groups with opposing actions. One pulling model alone does not show all the coordination in a real arm.

3. Our evidence record

Our model has two cords on opposite sides of a hinged arm. Pulling one bends the hinge in one direction; pulling the other changes its position back.

Keep the science accurate

Detailed organ mechanisms, disease diagnosis and reproductive-health content are not in this six-part outline. Keep models at broad function level.

Apply the evidence

Use a specific observation from this lesson to explain one choice. Point to a clue, then connect that clue to a scientific idea.

Curriculum reference: <https://www.nextgenscience.org/dci-arrangement/4-Is1-molecules-organisms-structures-and-processes>

Talk through the evidence

1. How do contracting muscles act in this model?

Expected answer: By pulling

Reasoning: Muscles can contract, becoming shorter and pulling on structures. Muscles work with bones and joints to produce many movements.

2. Why use two opposing cords?

Expected answer: To model different pulling actions

Reasoning: Muscles often work in groups with opposing actions. One pulling model alone does not show all the coordination in a real arm.

3. What allows the arm pieces to bend?

Expected answer: The hinge representing a joint

Reasoning: Muscles can contract, becoming shorter and pulling on structures. Muscles work with bones and joints to produce many movements.

4. What is a limitation?

Expected answer: Cords leave out much living muscle coordination

Reasoning: Muscles often work in groups with opposing actions. One pulling model alone does not show all the coordination in a real arm.

Guide the discussion

Ask learners to name the evidence that supports their answer. If an answer differs, revisit the matching key idea on page 2 and invite a revised explanation.

Online rewards: this lesson grants one fixed digital Expedition Discovery. Five saved digital Gemling friends become available only after all six distinct subject lessons are complete, in any order. Digital rewards do not establish physical ownership.