

Photo Description



A student in a red shirt is jumping over an orange cone on a grass field during an outdoor activity. The student's body is airborne, showing the moment of flight during a jump. Other students and adults are visible in the background, watching the activity take place.

Scientific Phenomena

Anchoring Phenomenon: A student jumping and becoming temporarily airborne.

Why This Happens (Scientific Explanation): When the student pushes hard against the ground with their legs, they apply a force that propels their body upward. Once their feet leave the ground, gravity (an invisible force pulling things downward) gradually slows them down and brings them back to Earth. This demonstrates the relationship between force, motion, and gravity—core concepts in understanding how objects move.

Core Science Concepts

1. **Force:** A push or pull that causes something to move, stop, or change direction. In this case, the student's leg muscles push against the ground.
2. **Motion:** The act of moving from one place to another. The jumping action shows motion in an upward direction, then downward.
3. **Gravity:** An invisible force that pulls objects toward Earth. It affects the student's ability to jump and determines when they land.
4. **Speed and Direction:** The student moves upward quickly (speed), demonstrating that forces have both magnitude and direction.

Pedagogical Tip:

Help students understand force and motion by using the language of "pushes and pulls." Ask them to identify which muscles are pushing during a jump. This concrete approach bridges abstract concepts to their own bodies and experiences.

UDL Suggestions:

Provide multiple means of engagement by allowing students to choose how they explore jumping: some students might prefer jumping over cones (kinesthetic), others might draw pictures of jumping (visual), and some might use action words to describe what they see (verbal). This honors diverse learning preferences while teaching the same concepts.

Discussion Questions

1. What made the student's body go up into the air? (Bloom's: Understand | DOK: 1)
2. Why did the student come back down to the ground? Could they stay in the air forever? (Bloom's: Analyze | DOK: 2)
3. If the student pushed even harder with their legs, what might happen to their jump? Why? (Bloom's: Predict/Apply | DOK: 3)
4. How is jumping over a cone different from jumping without an obstacle? What forces are involved in each? (Bloom's: Compare and Evaluate | DOK: 3)

Extension Activities

1. Jump Challenges: Set up a safe obstacle course with cones at different distances. Have students predict whether they can jump over each cone, then test their predictions. Record data about which jumps were successful and why (strength, distance, practice).
2. Force Detective Walk: Take students on a "force walk" around the classroom and playground. Have them identify and label examples of pushes and pulls they see (doors opening, balls rolling, swings moving). Create a class poster of all the forces they discover.
3. Design a Jump: Provide students with cardboard tubes, tape, and paper to design their own "jumping machine" or springy device using their understanding of how forces create motion. Test which designs allow objects to jump the farthest.

NGSS Connections

Performance Expectation:

K-PS2-1: Plan and conduct an investigation to provide evidence that a push or a pull can change the speed or direction of an object's motion. (NGSS Grade K—foundational; appropriate for Grade 2 application and extension)

Disciplinary Core Ideas:

- K-PS2.A Forces and Motion
- K-PS2.B Types of Forces

Crosscutting Concepts:

- Cause and Effect
- Energy and Matter

Science Vocabulary

- * Force: A push or pull that makes something move, stop, or change direction.
- * Jump: To push off the ground with your legs and move through the air.
- * Gravity: An invisible force that pulls things downward toward Earth.
- * Motion: The act of moving or changing position.
- * Speed: How fast something is moving.
- * Direction: The way something is moving (up, down, left, right, forward, backward).

External Resources

Children's Books:

- Push and Pull by Lola M. Schaefer (Heinemann Library)
- Jump, Frog, Jump! by Robert Kalan, illustrated by Byron Barton (Greenwillow Books)
- Forces Make Things Move by Kimberly Bradley (HarperCollins)

YouTube Videos:

- "Gravity for Kids" (Crash Course Kids, ~5 min) — A fun, animated explanation of gravity and why things fall: <https://www.youtube.com/watch?v=gHdQnWc4n-A>
- "Push and Pull Forces for Kids" (Learning Videos for Kids, ~3 min) — A simple, engaging introduction to pushes and pulls with real-world examples: <https://www.youtube.com/watch?v=G3-1JQVbYNg>

Teacher Tip: This jumping activity is excellent for kinesthetic learners and connects directly to students' own bodies. Consider having students jump in a designated outdoor area with proper supervision and plenty of space to ensure safety.