

## Photo Description



A skateboarder in a white helmet and turquoise shirt is jumping high into the air at a skate park. The skateboard is flying below them, separated from their body. You can see concrete ramps, curves, and flat areas in the background where skaters practice tricks.

## Scientific Phenomena

**Anchoring Phenomenon:** An object (the skateboard) in motion continues to move even after separating from the person who was moving it.

**Why This Happens:** When the skateboarder pushes off the skateboard to jump, they give the board energy to move. The skateboard keeps rolling forward because of inertia—objects that are moving want to keep moving in the same direction until something stops them (like friction or hitting a wall). The skater's body goes up into the air because they pushed down and away from the board, but the board continues forward along the ground.

## Core Science Concepts

- \* Motion: Objects move in different ways. The skateboard rolls along the ground while the skater moves up and through the air.
- \* Energy Transfer: When the skater pushes on the skateboard, they pass their energy to it, making it move faster.
- \* Forces and Movement: The skater's legs push down (force) to make both themselves and the skateboard move.
- \* Inertia: Once something is moving, it keeps moving unless a force stops it.

### Pedagogical Tip:

For first graders, avoid using the word "inertia" directly in instruction. Instead, use language like "things that are moving keep moving" and "things at rest like to stay at rest." Use simple, repeated demonstrations with rolling balls and toy cars to build this intuitive understanding before introducing the concept name.

### UDL Suggestions:

Provide multiple means of engagement by setting up a hands-on skateboard or rolling object station where students can physically push toys and observe what happens. Use a visual anchor chart with photos showing objects at rest and in motion. Allow students to respond to discussion questions through movement (jumping to show "yes," staying still to show "no") as well as through verbal responses, supporting kinesthetic and auditory learners.

## Zoom In / Zoom Out

### Zoom In: The Tiny Wheels

When we zoom way in on the skateboard wheels, we can see they're made of rubber. The rubber is made of tiny, tiny pieces called molecules that stick together. When the skateboard rolls, those molecules rub against the ground, and that rubbing is called friction. Friction is a force that slows things down and eventually makes the skateboard stop rolling. Without friction, the skateboard would keep rolling forever!

### Zoom Out: Skateboard Parks and Communities

When we zoom out and look at the whole skate park, we see it's a special place built for people to practice skateboarding safely. Skate parks are part of communities—they need engineers to design them, workers to build them, and volunteers to keep them clean and safe. Skateboarding is also a sport that connects people around the world who love the same activity. The concrete, ramps, and open spaces are all designed to help skaters move in different ways and have fun while learning about motion and balance!

## Discussion Questions

1. What made the skateboard move so fast? (Bloom's: Remember | DOK: 1)
2. Why did the skateboard keep moving even after the skater jumped off it? (Bloom's: Analyze | DOK: 2)
3. If someone put a wall in front of the skateboard, what do you think would happen to it? (Bloom's: Predict | DOK: 2)
4. How is the skater's movement different from the skateboard's movement? (Bloom's: Compare | DOK: 2)

## Potential Student Misconceptions

Misconception 1: "The skateboard is falling down like the skater jumped on it."

Clarification: The skateboard isn't falling—it's rolling forward along the ground! When the skater pushed off the board to jump into the air, they gave the board energy to roll forward. The skateboard stays on the ground moving sideways, while the skater's body goes up into the air. They move in different directions at the same time.

Misconception 2: "The skateboard will keep rolling forever and never stop."

Clarification: The skateboard will eventually stop rolling because of friction. Friction is a force that happens when the skateboard wheels rub against the ground. The rubbing slows the board down until it stops completely. Different surfaces (rough or smooth) create different amounts of friction.

Misconception 3: "You need to keep pushing to make something move."

Clarification: You only need to push once to get something moving! After you push, the object keeps moving on its own because of inertia—things that are moving like to keep moving. The object will only stop when another force (like friction or bumping into something) makes it stop.

## Extension Activities

1. Rolling Toys Exploration Station: Set up ramps and flat areas with toy cars, balls, and rolling objects. Have students roll toys and observe how far they travel. Ask: "What made it stop?" This builds understanding of motion and forces through hands-on play.

2. Push and Go Game: Mark a starting line and finish line on the gym floor or outdoor area. Give students toy cars or balls to push gently, then watch how far they travel before stopping. Compare which objects traveled farther and discuss why (surface type, size, weight).

3. Human Motion Freeze Dance: Play music and have students move and jump. When the music stops, they freeze in place. Discuss: "Your body was moving, but now it stopped because you used a force (your muscles) to stop. Things that are moving can be stopped by forces!"

### Cross-Curricular Ideas

Math Connection: Measuring Distance and Distance Comparisons

After students push toy skateboards or rolling objects, measure how far each one travels using non-standard units (like hand-spans or blocks). Create a simple bar graph showing which skateboard or toy traveled the farthest. This connects motion to measurement and data representation.

ELA Connection: Action Words and Movement Stories

Read or create simple sentences about skateboarding using action verbs: "The skater jumps. The skateboard rolls. The wheels spin." Have students act out these words or draw pictures to match them. Students can dictate or write simple sentences about things they've seen move: "The ball rolls. The car goes fast."

Art Connection: Motion in a Still Picture

Create artwork showing movement using lines, arrows, and colors. Have students draw a skateboard and use curved or straight lines to show which way it's moving. They can use bright colors to show fast movement and light colors to show slow movement. Display these alongside photos of skateboarders to show how artists show motion without real movement.

Social Studies Connection: Community Helpers and Safe Spaces

Discuss the people who help keep skate parks safe and fun: park workers, safety inspectors, and coaches. Talk about rules and safety gear (like helmets) that help people in our community stay safe while playing. Students can draw or discuss other community spaces where people play and move (playgrounds, pools, basketball courts).

### STEM Career Connection

Skateboard Designer

A skateboard designer creates new skateboards that work well and look cool! They think about how to make skateboards that are strong, light, and fun to ride. They test their designs to make sure skaters stay safe while jumping and doing tricks. Skateboard designers use science to understand motion and forces.

Average Salary: \$45,000–\$65,000 per year

Civil or Skate Park Engineer

A skate park engineer designs and builds safe skateboarding parks. They plan where to put ramps, curves, and flat areas so skaters can practice different tricks. Engineers use math and science to make sure the concrete is smooth and the structures are safe for people to jump and ride on.

Average Salary: \$60,000–\$85,000 per year

Physical Therapist or Sports Coach

A sports coach or physical therapist helps skaters learn how to move their bodies safely and improve their skills. They understand how the body moves and what forces it needs to jump high and balance on a skateboard. They teach skaters stretches and exercises to stay healthy and strong.

Average Salary: \$50,000–\$75,000 per year

## NGSS Connections

Performance Expectation: K-PS2-1

Represent and explain the motion of objects using evidence, with teacher guidance, that things can move in different ways.

Disciplinary Core Ideas:

- K-PS2.A|PS2.A: Forces and Motion

Crosscutting Concepts:

- Patterns|Patterns
- Cause and Effect|Cause and Effect

## Science Vocabulary

\* Motion: When something moves from one place to another.

\* Energy: The power to make things move or change.

\* Force: A push or a pull that makes something move or stop.

\* Skateboard: A board with wheels that rolls and can carry a person.

\* Inertia: The way things that are moving keep moving, and things that are still like to stay still (use simpler language: "things like to keep doing what they're already doing").

## External Resources

Children's Books:

- Things That Go by Rob Colson (explores movement and vehicles)
- The Little Blue Truck by Alice Schertle (motion and transportation)
- Motion by Lola M. Schaefer (simple introduction to movement)