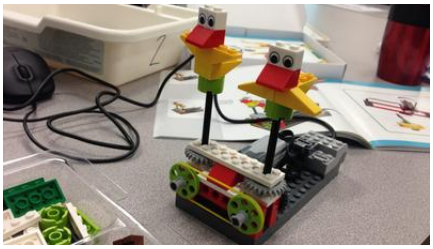
Photo Description



This image shows LEGO creations that look like colorful robots and vehicles with moving wheels and parts. The structures are made from bright blocks in red, yellow, and green, connected together on a table. Some creations have wheels that can spin, and others have standing figures with googly eyes that look like they're ready to move.

Scientific Phenomena

Anchoring Phenomenon: How do we build things that move?

These LEGO structures demonstrate simple machines and engineering design. When students build with interlocking blocks and add wheels, they are discovering that wheels are simple machines that reduce friction and help objects move more easily. The structures also show how different materials and shapes can be combined to create something new. Wheels roll instead of slide, which requires less force—this is the fundamental principle behind why wheels are one of humanity's greatest inventions. In Kindergarten, students observe that round objects (wheels) behave differently than flat objects, and that putting things together in different ways creates different results.

Core Science Concepts

* Simple Machines (Wheels & Axles): Wheels are circular objects that spin on a rod (axle) to help things move. They reduce the effort needed to move something heavy or far.

Cause and Effect: When you push a wheeled object, it rolls. When you push a flat-bottomed object, it slides. The cause (pushing) creates different effects* depending on the design.

* Engineering Design: Engineers plan and build things by choosing materials, testing ideas, and making changes to make things work better.

* Friction: Wheels help reduce friction (the rubbing force between surfaces), making movement smoother and easier.

Pedagogical Tip:

In Kindergarten, avoid technical jargon. Instead of saying "friction," say "the sticky feeling when things rub together." Let students feel the difference by rolling a block on its flat side versus rolling a wheel. This kinesthetic approach helps young learners internalize the concept without memorizing vocabulary.

UDL Suggestions:

Multiple Means of Representation: Display images of wheels in real life (car tires, roller skates, shopping carts) alongside the LEGO models. Multiple Means of Action/Expression: Allow students to build their own wheeled structures and draw or dictate what they notice. Multiple Means of Engagement: Connect building to students' favorite vehicles (buses, trains, bikes) to increase relevance and motivation.

Discussion Questions

1. "What happens when we push the wheeled car versus when we push a block without wheels?" (Bloom's: Analyze | DOK: 2)

2. "Why do you think wheels are round instead of square?" (Bloom's: Evaluate | DOK: 3)

3. "Can you tell me a story about what your robot or car might do if it could really move?" (Bloom's: Create | DOK: 3)

4. "If you were going to build something that moves, what would you use—wheels or flat edges? Why?" (Bloom's: Evaluate | DOK: 2)

Extension Activities

1. Wheel Exploration Station: Provide students with various round objects (jar lids, paper cups taped into circles, actual toy wheels) and have them roll them down a ramp. Ask: "Which one rolls the farthest? Why?" Students can predict, test, and compare—building early scientific thinking skills.

2. Build a Moving Vehicle: Using LEGO, blocks, or a cardboard box with paper-plate wheels, have students create their own wheeled vehicle. Encourage them to push it and observe how it moves. Ask them to decorate and name their creation, then create a "vehicle parade" where students move their creations around the classroom.

3. Wheels Around Us Scavenger Hunt: Take students on a short walk or look around the classroom to find things with wheels (shopping carts, chairs, toy cars, roller skates, wheelchairs). Take photos or draw pictures of each wheeled object found. Discuss: "Why do these things have wheels? What would happen without them?"

NGSS Connections

Performance Expectation:
K-PS2-1: Plan and conduct investigations to provide evidence that vibrations make sound and that vibrations can make other objects move.

Disciplinary Core Ideas:
- K-PS2.A - Forces and Motion: Pushes and pulls can move objects in different ways.
- K-ETS1.A - Engineering Design: Humans use natural and human-made materials to design and build structures that serve specific purposes.

Crosscutting Concepts:
- Cause and Effect - Simple cause-and-effect relationships exist in everyday situations.
- Systems and System Models - Objects and organisms can be described in terms of their parts; parts go together to make wholes.

Science Vocabulary

* Wheel: A round, flat object that spins around and helps things roll and move.
* Axle: The rod or stick that goes through the middle of a wheel so it can spin.
* Push: To use force to make something move away from you.
* Build: To put pieces together to make something new.
* Friction: The rubbing feeling that happens when two things slide against each other.
* Simple Machine: A tool that helps us do work more easily.

External Resources

Children's Books:
- Wheels Go Round by Sally Huss (bright, engaging board book about wheels)
- Goodnight, Goodnight Construction Site by Sherri Duskey Rinker (features construction vehicles with wheels)
- Little Blue Truck by Alice Schertle (perfect for discussing wheels and movement)

YouTube Videos:
- "How Wheels Work for Kids" by National Geographic Kids (2:15) – Clear, visually engaging explanation of wheels. https://www.youtube.com/watch?v=mNj1xYvlbmI
- "Simple Machines: Wheels and Axles" by Crash Course Kids (5:44) – Age-appropriate demonstration using relatable examples. https://www.youtube.com/watch?v=IsMzEQm8m5E

Teaching Tip: This lesson naturally integrates engineering practices (designing, building, testing) with physical science. Kindergarteners learn best through play-based exploration, so prioritize hands-on building time over direct instruction. Save 15-20 minutes for free building alongside guided exploration.