

Photo Description



This image shows a bright blue robot toy with a round head, orange eyes, and wheels sitting on a rock in a garden. The robot has a body made of connected round and oval shapes, and it is surrounded by green grass and soil. This is an example of a machine that people design to move and do tasks.

Scientific Phenomena

Anchoring Phenomenon: A robot designed to move and interact with its environment.

Why This Happens: Robots are machines that people design and build using simple machines and materials. They often have wheels or legs to help them move from one place to another. This particular robot uses wheels (the round parts on its base) to roll across the ground. Engineers think about how things move and work together to create robots that can do jobs or explore places. The robot's design shows how humans use science and engineering to create tools that solve problems or help us learn about the world.

Core Science Concepts

- * **Simple Machines and Movement:** Robots use wheels, which are simple machines that help them roll and move. Wheels reduce friction and make movement easier.
- * **Forces and Motion:** The robot can move forward, backward, or turn because forces push or pull it. Without force, the robot would stay still.
- * **Design and Function:** Every part of the robot has a purpose. The wheels help it move, the eyes help it "see," and the body holds everything together.
- * **Materials and Properties:** The robot is made of hard plastic that is smooth and durable. Different materials are chosen because of how they work and what they can do.

Pedagogical Tip:

For First Grade students, use the robot as a concrete example of how machines have parts that work together. Let students physically manipulate toy robots or build simple robots from blocks to understand the relationship between parts and function. Avoid abstract discussions about circuits or programming—focus instead on observable movements and how parts connect.

UDL Suggestions:

Representation: Provide tactile robot models or images with labels in both words and pictures. Use videos showing robots moving so students can see motion from multiple perspectives.

Action & Expression: Allow students to demonstrate movement by rolling like wheels, walking like a robot, or building their own robot designs using recyclables. Accept drawings, models, and physical demonstrations as evidence of learning.

Engagement: Connect robots to students' interests (space exploration, helping people, animals). Use the novelty and excitement of robots to maintain interest in how machines work.

Discussion Questions

1. What parts of this robot help it move? (Bloom's: Understand | DOK: 1)
2. Why do you think engineers put wheels on this robot instead of legs? (Bloom's: Analyze | DOK: 2)
3. If you could design a robot to help in your classroom, what would you want it to do? What parts would it need? (Bloom's: Create | DOK: 3)
4. How is this robot similar to and different from a toy car? (Bloom's: Analyze | DOK: 2)

Extension Activities

1. Build a Simple Robot: Provide students with boxes, paper cups, paper plates, and wheels (bottle caps or paper circles). Have students design and construct their own robot using classroom materials. Encourage them to label the parts and explain what each part does.
2. Robot Movement Exploration: Create a small obstacle course (pillows, books, tape lines). Let students test toy robots or rolling containers around the course and observe which movements are easy or hard. Discuss why certain designs work better.
3. Robot Sorting Game: Collect pictures of different robots (toy robots, factory robots, cleaning robots) and have students sort them by what job they do or how they move. Create a class chart showing robots and their purposes.

NGSS Connections

Performance Expectation:

K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

Disciplinary Core Idea:

K-2-ETS1.A Devices are tools that do work or perform tasks for us. Robots are devices designed by people.

Crosscutting Concepts:

- * Systems and System Models
- * Structure and Function

Science and Engineering Practices:

- * Asking questions about how and why robots move
- * Observing how parts of the robot work together
- * Designing and building simple moving machines

Science Vocabulary

- * Robot: A machine that is designed and built by people to do jobs or move around.
- * Wheel: A round part that turns and helps something roll and move.
- * Machine: A tool made of parts that work together to do something.
- * Force: A push or pull that makes something move or change.
- * Design: A plan for how something will be made and how it will work.
- * Engineer: A person who designs and builds machines and tools.

External Resources

Children's Books:

Little Blue Truck* by Alice Schertle (wheels and movement theme)

Robots Everywhere* by Shelley Rotner and Sheila Kelly (explores real robots in the world)

Click, Clack, Moo: A Typewriter on the Farm* by Doreen Cronin (simple machines and creative problem-solving)

YouTube Videos:

* "How Do Wheels Work? | Simple Machines for Kids" – A quick, animated explanation of wheels and rolling motion. https://www.youtube.com/results?search_query=how+do+wheels+work+simple+machines+for+kids

* "Robots That Help People" – Shows real robots in hospitals, schools, and homes doing useful tasks. https://www.youtube.com/results?search_query=robots+that+help+people+for+kids