

Photo Description



This picture shows the inside of a car where the engine lives. The engine is a big machine with many parts that work together. There are tubes, wires, and different colored pieces that help the car move.

Scientific Phenomena

The Anchoring Phenomenon is energy transformation in a car engine. The engine converts chemical energy stored in gasoline into mechanical energy that makes the car move. This happens through controlled explosions inside the engine cylinders, where fuel and air mix and ignite, creating force that moves pistons and ultimately turns the wheels. This demonstrates how energy changes from one form to another to do work.

Core Science Concepts

1. Energy Transformation: Chemical energy in fuel changes to mechanical energy for movement
2. Simple Machines: The engine contains levers, wheels, and other simple machines working together
3. Cause and Effect: When fuel burns, it causes the engine parts to move, which makes the car go
4. Systems: Many different parts work together as a system to make the car function

Pedagogical Tip:

Use toy cars and have students push them to demonstrate how force creates motion. This concrete experience helps kindergarteners understand the abstract concept of energy transformation.

UDL Suggestions:

Provide multiple ways to engage with this concept: visual diagrams, hands-on toy manipulation, sound recordings of engines, and movement activities where students act out being pistons moving up and down.

Zoom In / Zoom Out

1. Zoom In: Inside the engine cylinders, tiny explosions happen when fuel and air mix together and spark. These explosions push pistons up and down very fast, like hammers hitting in a pattern.
2. Zoom Out: Cars are part of our transportation system that helps people move around cities and towns. The energy from car engines comes from oil deep underground that formed millions of years ago from ancient plants and animals.

Discussion Questions

1. What do you think would happen if we didn't put gas in the car? (Bloom's: Predict | DOK: 2)
2. How is a car engine like your body when you run and play? (Bloom's: Compare | DOK: 2)
3. What other things need energy to move or work? (Bloom's: Apply | DOK: 1)
4. Why do you think car engines have so many different parts? (Bloom's: Analyze | DOK: 3)

Potential Student Misconceptions

1. Misconception: Cars eat gas like people eat food
Clarification: Cars don't eat - they burn fuel in a controlled way to create energy for movement
2. Misconception: The car engine makes the wheels spin directly
Clarification: The engine's energy travels through many parts before reaching the wheels
3. Misconception: Bigger engines always make cars go faster
Clarification: Speed depends on many factors, not just engine size

NGSS Connections

- Performance Expectation: K-PS2-1: Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object
- Disciplinary Core Ideas: PS3.C (Relationship Between Energy and Forces), PS2.A (Forces and Motion)
- Crosscutting Concepts: Cause and Effect, Energy and Matter

Science Vocabulary

- * Engine: The part of a car that burns fuel to make energy for moving
- * Energy: The power needed to make things move or work
- * Fuel: Something that burns to give energy, like gasoline
- * System: Different parts that work together to do a job
- * Force: A push or pull that can make things move
- * Motion: When something moves from one place to another

External Resources

Children's Books:

- Cars and Trucks and Things That Go by Richard Scarry
- The Magic School Bus: Revving Up with Magnetism by Joanna Cole
- Machines at Work by Byron Barton

YouTube Videos:

- "How Car Engines Work - Simple Explanation for Kids" - Shows basic engine concepts with simple animations and kid-friendly language (<https://www.youtube.com/watch?v=ZQvfHyfgBtA>)
- "Transportation Songs for Children" - Educational songs about different vehicles and how they move (<https://www.youtube.com/watch?v=Ct6BUPvE2sM>)