

## 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

## Cross-Curricular Ideas

1. Math + Science: Count the different colored parts in the engine (red, black, silver, blue). Sort pictures of engine parts by size (big, medium, small). Measure toy cars with blocks to compare lengths.
2. ELA + Science: Read *Cars and Trucks* and *Things That Go* and create a simple sentence frame: "The engine makes the car \_\_\_\_." Create a word wall with engine vocabulary and draw pictures to match words like "fuel," "move," and "energy."
3. Social Studies + Science: Take a walking field trip around the school or neighborhood to identify different types of vehicles and discuss how they help our community (ambulances, fire trucks, school buses). Talk about workers who fix cars and help us travel safely.
4. Art + Science: Paint or collage pictures of cars and engines using circles, rectangles, and tubes to represent engine parts. Create a large class mural showing a car's journey from home to school, labeling the energy needed at each stop.

## STEM Career Connection

1. Automotive Mechanic: A mechanic is a person who fixes and takes care of cars to keep them running well. They use tools to find problems in the engine and repair the parts that aren't working. It's like being a doctor for cars! Average Annual Salary: \$40,000 - \$50,000 USD
2. Engineer: Engineers design and build car engines and all the parts that make cars work. They figure out how to make engines stronger, faster, and better for the environment. Engineers solve tricky problems and create new inventions. Average Annual Salary: \$75,000 - \$95,000 USD
3. Automotive Electrician: This worker specializes in the electrical parts of a car, like the battery, wires, and lights. They make sure the electricity flowing through the car helps the engine and all the car's systems work properly. Average Annual Salary: \$45,000 - \$55,000 USD

## 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