SimpleSci

AN ILLUSTRATED SCIENCE ADVENTURE

Maya & Max and the Sunset Signal

Five machines. One mission.
A whole new way to see how things work.



Cars / Solar / Electric vehicles / Airplanes / Rockets

Ages 10-14 | Read, wonder, draw and discover

Bring your curiosity

Maya asks why. Max asks what would happen if. At the SimpleSci Discovery Center, they have one afternoon to turn those questions into a working machine.

Read the story straight through, or take one chapter at a time. When a diagram appears, pause and trace what moves: fuel, charge, air, exhaust or energy. You do not need to memorize every new word. Come back to the glossary whenever it helps.

YOUR PART IN THE STORY

Before each chapter ends, try the question. Explain your idea to someone, sketch it, or keep reading and test it against what happens next.

YOUR ROUTE THROUGH THE BOOK

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This is a fictional story with real science. The model Moon is inside an ordinary room; the book points out where that model differs from an actual lunar mission.

A light before night

Maya had barely stepped into the SimpleSci Discovery Center when her brother stopped so suddenly that she bumped into his backpack.

"There is a Moon in here," Max said.

A gray landscape stretched across a long table. Paper mountains cast sharp shadows. At the far end stood a tiny landing pad. Above it, a sign announced the evening show: **THE SUNSET SIGNAL.**

Dr. Rivera, the exhibit engineer, rolled over a tray of parts. "Our challenge is to carry a small beacon across this model landscape and keep it glowing when we dim the lights. Want to design the vehicle?"

Max reached for the biggest wheels. Maya reached for a pencil.

"One more thing," Dr. Rivera said. "Explain which ideas would work on the real Moon. Our room has air. The Moon has almost none."

The show began at six. Their dad found a seat beside the workbench. "I will be your first audience," he said.

Maya wrote three questions: **Where will the energy come from? What will make it move? What changes when the lights go out?**

THE CHALLENGE



Carry the beacon. Stay upright. Keep the light on after dark.

A push that becomes a turn



"A tiny gasoline engine," Max announced. "Like the car that brought us here."

Dr. Rivera led them to a see-through engine model. Maya turned its handle. A metal piston slid down, then up. Below it, a shaft went around.

"In a working engine, hot gas supplies the push," Dr. Rivera said. "A spark starts fuel burning inside this cylinder. The gas gets hot and presses the piston down."

Maya followed the connecting rod with her finger, outside the clear cover. "Straight movement becomes spinning movement."

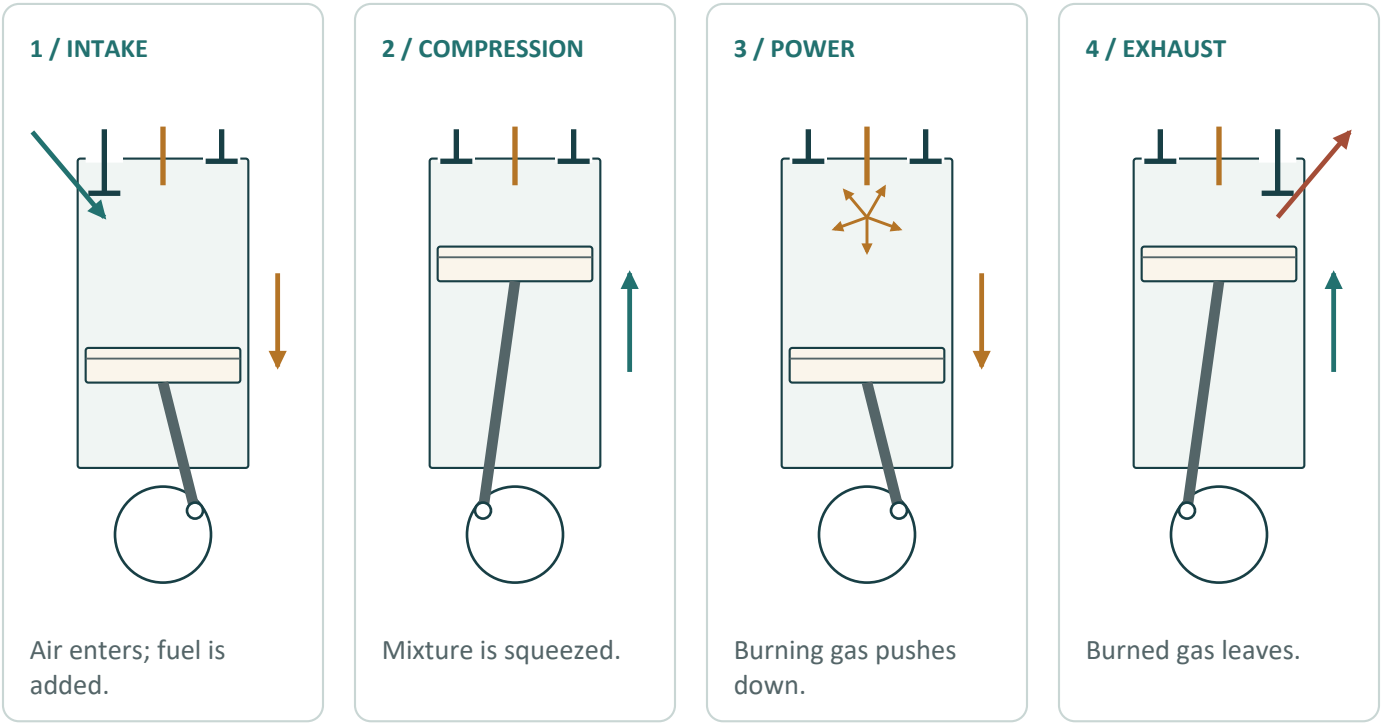
"Like your leg pushing a bicycle pedal," Max said.

"Exactly that kind of motion change. But here the fuel supplies the energy, not a rider."

Maya added a new arrow to her notebook: **stored energy to motion.** They had found one way to move. Now they needed to see the whole cycle.

Four strokes. One power push.

Maya turned the model slowly. Each trip of the piston was a **stroke**. Four strokes made one complete cycle.



Simplified gasoline engine; strokes shown at selected positions. Arrows show piston motion.

The **spark plug** starts combustion: the controlled burning of fuel. It does not supply most of the energy that moves the car. That energy comes from the fuel.

A **connecting rod** links the piston to the **crankshaft**. Their geometry turns an up-and-down push into rotation. Momentum in the spinning parts, and power from other cylinders in a multi-cylinder engine, help carry the cycle through the other strokes.

"So it does not burn fuel on all four strokes," Maya said. "One power stroke, then the engine gets ready to do it again."

NOW YOU KNOW

A gasoline engine turns chemical energy in fuel into heat and then motion. Some energy also leaves as unwanted heat and sound.

Moving is only half the job

Max rolled a toy car across the bench. It bumped into a notebook. "Ours needs a plan for stopping," Maya said.

GEARS

Trade speed for turning force

Think of shifting a bicycle into a low gear on a hill. More pedal turns produce each wheel turn, but the push is easier. Car gears also trade speed for **torque**, or turning force. They do not create energy.

STEERING

The ground pushes back

Steering changes wheel direction. With enough **traction**, or grip, the road can push sideways on the tires and turn the car. On a slippery surface, pointing a wheel is not enough.

BRAKES

Motion becomes heat

Brake pads squeeze rotating discs. **Friction** changes energy of motion into thermal energy. Rub your palms gently together: that warmth is a small version of the same energy change.

SUSPENSION

Keep the tires in contact

Springs let wheels move over bumps; shock absorbers damp the bouncing. Together they help tires stay on the road, where they can steer and brake. A smoother ride also needs good contact.

NOW YOU KNOW

An engine, gears, tires, steering, brakes and suspension work together. A vehicle is a team of parts.

The missing ingredient

"Fuel fits in a tank," Max said. "We could carry the energy with us."

"True," Dr. Rivera replied. "But what else does a gasoline engine take in?"

Maya looked back at the first stroke. "Air. It needs oxygen for the fuel to burn."

On the real Moon, an ordinary gasoline car could not simply breathe in air as it does on Earth. Dr. Rivera had another rule, too: no fuel or flames in their tabletop model.

Max crossed out *tiny gasoline engine*. He did not cross out the useful idea beneath it: **Carry energy for the trip.**

Across the courtyard, sunlight flashed off a dark blue panel. Maya picked up the notebook. "Could we start there instead?"

BEFORE CARS WERE ORDINARY

Imagine a carriage moving with no horse. In 1886, Carl Benz patented a gasoline-powered three-wheeler. Two years later, Bertha Benz took an improved model on a long road trip. In 1913, Ford's moving assembly line helped make cars quicker to build. Making a machine useful takes testing, production and people willing to try it.

PAUSE & WONDER

If the spark starts the burn, why does the car still need a tank of fuel?

An answer to compare with your own is on page 27.

Can you catch a sunny afternoon?



The terrace display had no moving parts. Sunlight fell on a panel, and a small fan spun beside it.

"Where is the engine?" Max asked.

"There is no engine in the panel," Dr. Rivera said. "Light carries energy. A solar cell can change some of it into electrical energy."

Maya noticed a leaf shadow creeping over the display. The fan slowed as the shade spread.

"Less light reaching the panel," she said. "Less power for the fan."

Dr. Rivera moved the display back into full sunlight. She showed them a separate panel connected through a charge controller to a covered battery pack.

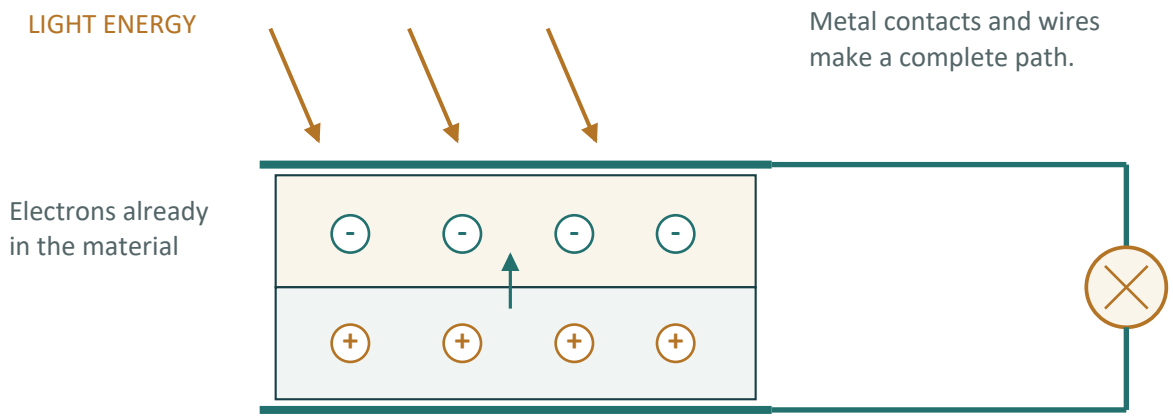
"This one has been charging since morning."

"Then we do not need to bottle sunlight," Max said.

"We need to store some of its energy," Maya replied. But first she wanted to understand how light could make anything electrical happen at all.

Light in. Electrical energy out.

A solar cell is a carefully built piece of material. Most use **silicon**, a semiconductor: a material whose electrical behavior engineers can control.



Schematic charge separation; layers and particles are not to scale.

Light arrives in packets of energy called **photons**. When a cell absorbs suitable photons, their energy can free **electrons**, tiny negatively charged particles, to move within the material. The electrons were already there; sunlight does not deliver a fresh supply.

The cell's built-in **electric field** helps separate charges. Think of a ramp giving a ball a preferred direction. The cell uses an electric force, not gravity, and the light provides the energy.

Metal contacts connect the cell to an outside path. In a complete **circuit**, moving charge forms an **electric current** that can transfer energy to a device. The lamp uses energy, not a supply of disappearing electrons.

NOW YOU KNOW

Light supplies energy. The cell helps separate charges. A closed circuit lets electrical energy do a job.

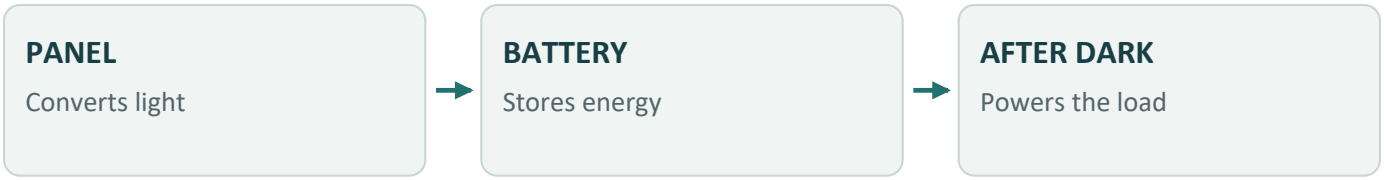
But the show starts after sunset

"When we turn out the room lights, will the panel remember the sunshine?" Max asked.

"A panel does not store energy," Maya said, checking her new diagram. "It converts it while light is available."

Dr. Rivera tapped the battery pack. Charging it uses electrical energy to change its chemistry. Later, those chemical changes can supply electrical energy to a circuit. A battery is an energy store, not a box stuffed with spare electrons.

They chose a compatible pack that had already charged during the day. Recharging takes time; a panel cannot instantly fill any battery they happen to connect.



MORE AREA Cells connect into panels; panels connect into arrays. More collecting area can supply more power when enough sunlight reaches it.

LIGHT, NOT HEAT Shade usually lowers output. Clouds can reduce it too. Heating a panel is not the goal: very hot solar cells often become less efficient.

AT HOME Panels produce direct current (DC). An inverter converts DC into alternating current (AC) for household use. Our small DC model does not need a household inverter.

NOW YOU KNOW

For a job after sunset, collect energy beforehand and store it. The panel alone cannot power the dark.

Save some Sun for later

Maya sketched the Sun, a panel, a battery and a little lamp.

"Can we make the rover and the light share the battery?" she asked.

"Yes, if the battery and the circuit are designed for both loads," said Dr. Rivera. A **load** is a device that receives electrical energy, such as a motor or a lamp.

Max set the glowing beacon on the empty chassis. Nothing moved.

"We solved the light," he said. "We have not solved the going."

A full-size electric car stood in the next gallery. Maya turned to a fresh notebook page. "We already know a battery can power a lamp. What would it take to turn wheels?"

SOLAR POWER WENT TO SPACE

A rooftop is not the only place to find solar cells. In 1954, Bell Labs demonstrated a useful silicon solar cell. In 1958, Vanguard 1 became the first solar-powered satellite. Engineers could keep equipment working without visiting to replace its batteries. Small cells opened up much bigger possibilities.

PAUSE & WONDER

The battery is charged, but the lamp is off. What should you check before blaming the Sun?

An answer to compare with your own is on page 27.

The quiet machine



The electric-car exhibit had a section of floor removed. A wide battery pack lay beneath the seats. Near the wheels sat a motor.

Max bent to look underneath. "No pistons?"

"Not for driving this car," Dr. Rivera said. "An electric motor uses magnetic forces to produce rotation."

At a safe tabletop display, Maya pressed a button. Current flowed through coils of wire. A rotor began to turn inside them.

"Electricity makes a magnetic field," she said. "And changing the magnetic forces keeps the rotor turning."

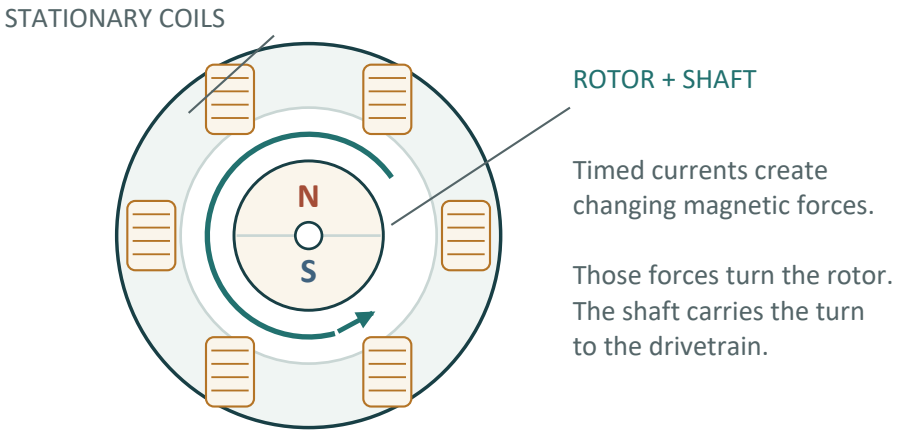
Max held the rover's small motor beside its axle. Suddenly its purpose looked obvious.

Dr. Rivera helped them fit the motor and reduction gears from the model kit. "A motor does not make energy from nothing," she reminded them. "Follow its supply."

Maya pointed to the battery. "We are giving our stored energy a new job."

How do magnets turn the wheels?

The accelerator is a request for motion. Electronics control how electrical energy reaches the motor, so magnetic forces can turn its shaft.



Simplified example of a permanent-magnet motor; EV designs vary.

An **electromagnet** is a coil that produces a magnetic field when current flows. In many EV motors, controlled currents in stationary coils create a rotating magnetic field. It acts on the rotating part, the **rotor**, producing torque.

Think of a team taking turns pushing a playground roundabout. Timing keeps it moving. In the motor, carefully timed magnetic forces do the turning; there are no people or invisible hands inside.

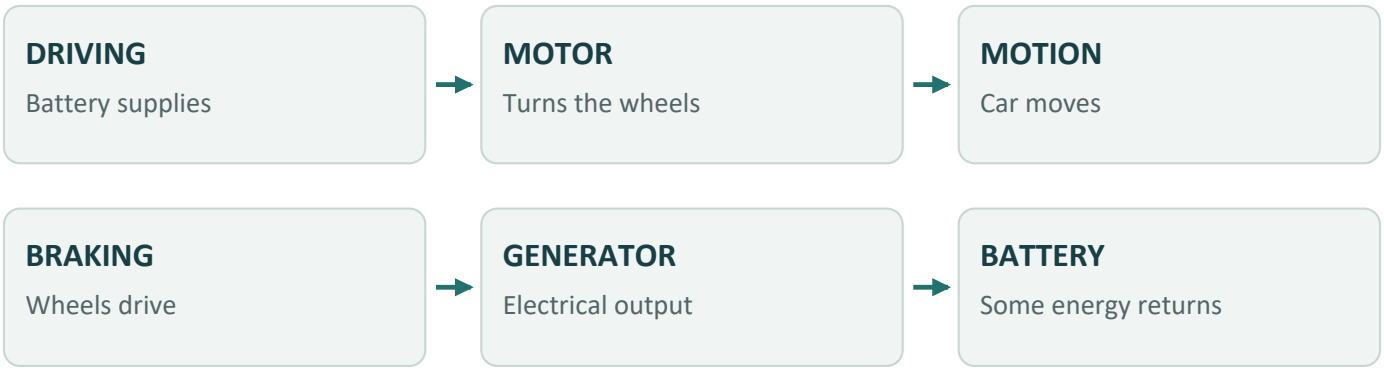
A full-size EV often uses an **inverter** to turn battery DC into controlled AC for the motor. Gears transfer the turn to the wheels. The little rover uses a simpler DC motor and control circuit, but the same energy-to-motion idea.

NOW YOU KNOW

Battery energy becomes electrical energy, then motor rotation, then vehicle motion. Some energy becomes heat along the way.

Can a moving car charge its battery?

At the driving simulator, Maya eased off the accelerator. An arrow on the display changed direction. "Energy going back?" she asked.



With **regenerative braking**, the moving wheels drive the motor so it acts as a generator. It converts some energy of motion back into electrical energy. Suitable electronics send that energy toward the battery, slowing the vehicle.

"Then drive downhill forever!" Max suggested.

Maya laughed. "You still have to get uphill." On a descent, gravitational potential energy can also be recovered. Neither downhill driving nor braking creates energy from nothing. Losses mean the car never gets every bit back.

EVs still need friction brakes. Regeneration can be limited, including when the battery is full or too cold. Temperature-control systems help batteries and motors operate in a useful range.

Their simple rover had no regenerative system. They would plan its route and use the stored energy carefully instead.

NOW YOU KNOW

A motor can drive the wheels; a generator can receive motion from them. Regenerative braking recovers some energy, not all of it.

The first test leaves tracks

The rover rolled three feet, climbed a shallow bump and stopped beside Maya's pencil.

"It works!" Max said.

"On this part of the route," Maya answered. She had started to like those extra words.

The wheels needed grip. The motor needed enough turning force. The battery had to power both travel and the beacon. Dr. Rivera showed them how a controller could set a gentler speed.

At the model Moon, they found a cardboard ridge. The path around it was longer. Max looked up at a suspended airplane.

"Could we go over instead of around? Wings would be quicker."

Maya did not cross out his idea. She wrote: **Test what the idea needs.**

ELECTRIC CARS ARE OLDER THAN YOU THINK

By around 1900, electric cars were already part of the mix on city streets, alongside steam and gasoline cars. Gasoline vehicles later became dominant. Better batteries and power electronics helped electric driving grow again. An old idea can get a new future when its supporting technology improves.

PAUSE & WONDER

Would adding regenerative braking let the rover run forever? Why or why not?

An answer to compare with your own is on page 27.

Borrowing an invisible river



At the wind tunnel, a wing model hung in a clear enclosure. Thin ribbons traced air flowing past it.

Dr. Rivera switched on the fan. "Watch what changes when I tilt the wing."

The lift reading rose. Maya followed the bending ribbons with her eyes. "The wing is changing the airflow."

"It turns some air downward," Dr. Rivera said. "The forces between the wing and the air produce lift. The pressure around the wing changes too. These are connected descriptions of the same interaction."

Max tilted his notebook as if it were a wing. "Then we tilt it more."

Dr. Rivera increased the model's angle. The airflow separated over much of the upper surface. Lift dropped.

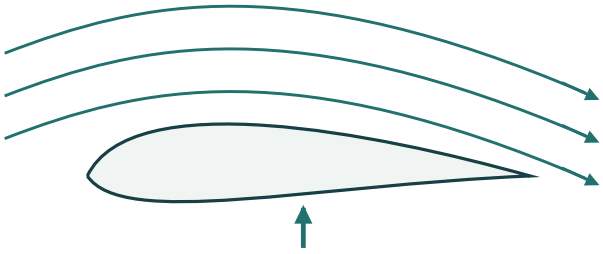
Max lowered the notebook. "There is a catch."

"There is a limit," Maya said. "That is why we test."

More angle is not always better

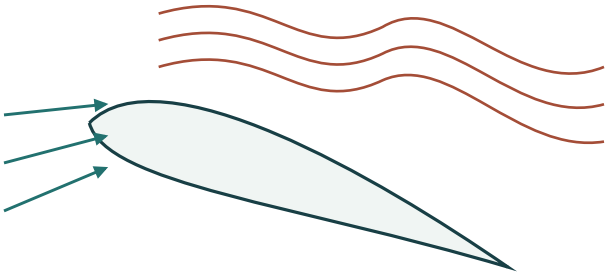
A wing meets the oncoming air at an **angle of attack**. With air moving past it, its shape and angle affect lift.

ATTACHED FLOW



Air bends around the wing and leaves with a downward turn.

STALLED FLOW



Too much angle: widespread separation reduces lift.

Up to a point, increasing angle of attack can increase lift. Beyond a critical angle, airflow separates extensively and lift falls. This is a **stall**. It is about airflow over the wing, not the engine switching off.

Airflow speed matters too. At the same angle and in similar conditions, faster airflow generally means more lift. Pilots manage speed and angle together.

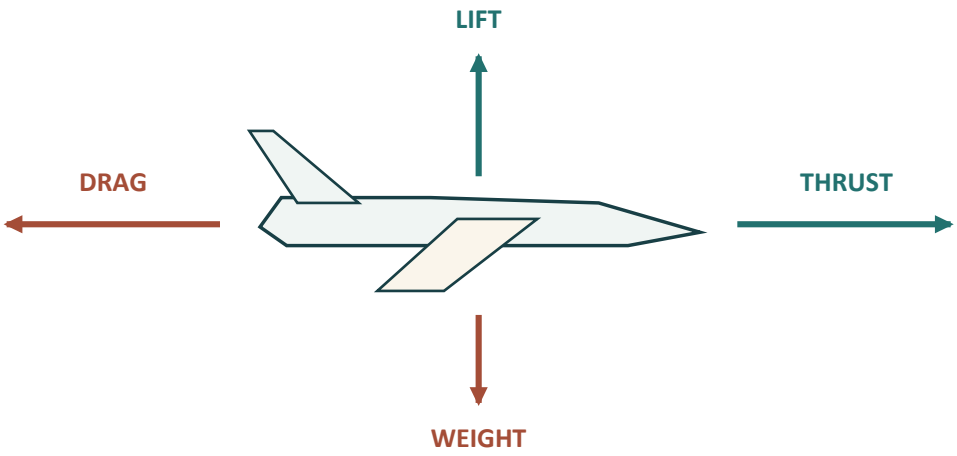
There is no rule that two bits of air split at the front of a wing must meet again at the back. Lift does not depend on that story. A wing changes airflow and pressure; the air exerts forces on the wing.

NOW YOU KNOW

A wing needs suitable airflow. Its shape, speed and angle work together, and too much angle can cause a stall.

Four forces. Three ways to turn.

In straight, level flight at constant speed, lift balances weight and thrust balances drag. Change the balance and the motion can change.



A propeller or jet engine provides **thrust** by accelerating air or exhaust backward. **Drag** resists motion through air. Gravity gives the airplane **weight**.

Flaps change wing shape to provide more lift at lower speeds, useful for takeoff and landing. They also add drag. Strong, lightweight structures reduce the mass the wings must support. Engineering choices often bring both a benefit and a cost.

ROLL Ailerons on the wings help tip one wing up and the other down. Banking tilts lift so part of it can turn the airplane.

PITCH The elevator on the horizontal tail helps move the nose up or down.

YAW The rudder on the vertical tail helps move the nose left or right. Pilots coordinate controls for smooth turns.

A great idea in the wrong place

Max glided a folded paper airplane along the test lane. It cleared a pretend mountain.

"It works in the museum," he said.

"What is doing the lifting?" Maya asked.

"Air." Max looked toward the model Moon. "Oh."

The real Moon has an extremely thin exosphere, far too little gas for an ordinary wing to work as it does on Earth. A glider could look convincing in their room and still be the wrong answer for a lunar mission.

Maya drew a winding route around the ridge. "We keep the wheels."

Max studied the big rocket exhibit. "But a wheeled rover cannot drive all the way from Earth to the Moon."

Dr. Rivera nodded. "Different parts of a journey can need different machines."

TWELVE SECONDS THAT CHANGED FLIGHT

In 1903, Orville Wright's first powered flight lasted about 12 seconds and covered 120 feet. Wilbur and Orville had already spent years testing gliders and learning control. Their later flights grew longer. A short flight can matter enormously when it proves a useful idea.

PAUSE & WONDER

Why can a wing lift a model in this room but not an ordinary airplane on the Moon?

An answer to compare with your own is on page 27.

What does a rocket push against?



The rocket exhibit rose almost to the gallery ceiling. Its engine ended in a bell-shaped nozzle.

Max pointed upward. "If there is hardly any air on the Moon, what does a rocket push against in space?"

"Its own exhaust," Dr. Rivera said. "It accelerates matter one way and receives a push the other way."

Maya pictured a person on a freely rolling cart throwing a ball forward. The person and cart would move backward. The ball was something to push on, even without a wall.

"A rocket keeps throwing out gas," she said.

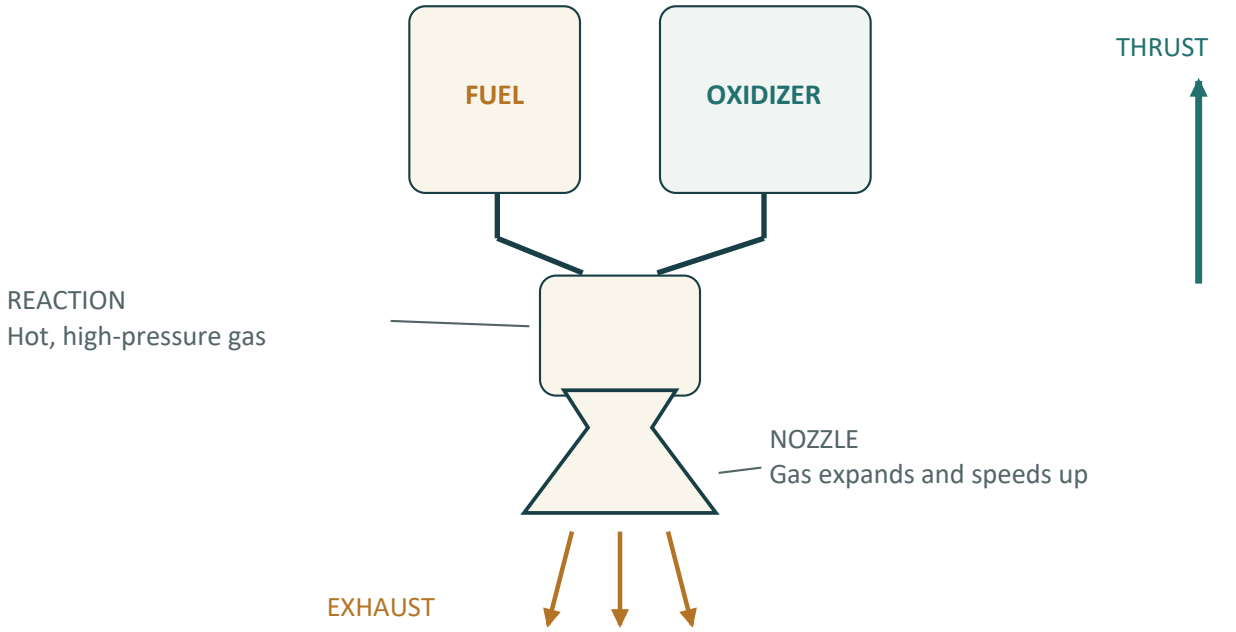
"Exactly. The force on the rocket is called thrust."

Behind a clear panel, two tanks fed a model combustion chamber. Max recognized the idea from the first gallery: fuel releasing energy.

"But this engine brought something else," he said. "It packed the missing ingredient."

Bring what the reaction needs

A liquid-propellant chemical rocket carries **fuel** and an **oxidizer**. Together they are its propellants. It does not need to take oxygen from surrounding air.



The propellants enter a **combustion chamber**, where a chemical reaction releases energy. Very hot, high-pressure gas forms. A **nozzle** narrows at its throat, then widens, helping the gas expand and accelerate outward.

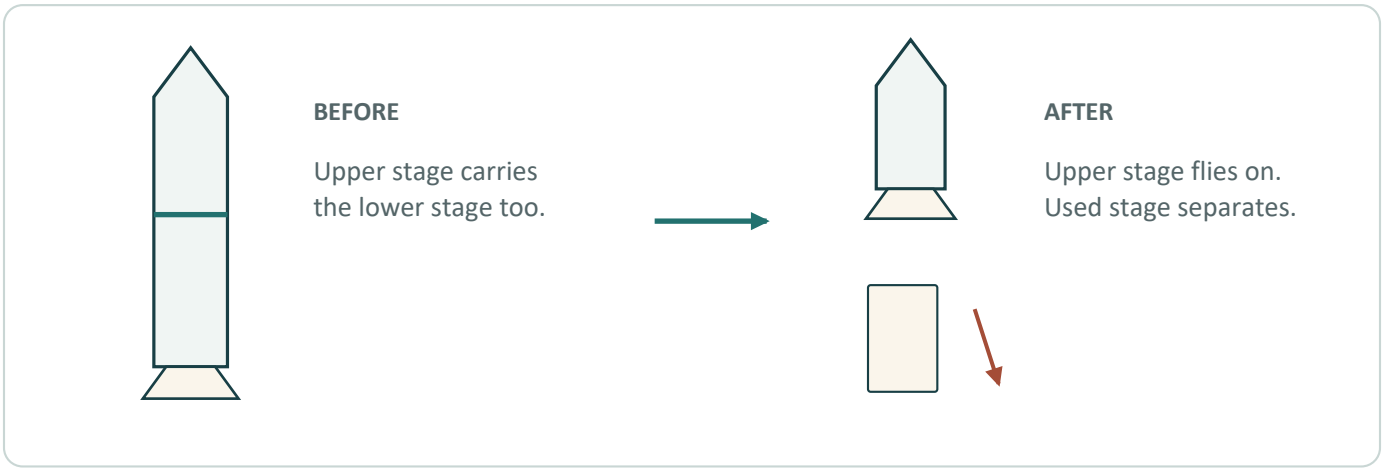
The rocket pushes exhaust backward; the exhaust pushes the rocket forward. This action-and-reaction pair is **Newton's third law**. The forces act on different things, so they do not cancel on the rocket.

At an upright liftoff, thrust must exceed the rocket's weight for it to rise. Once it is moving, air resistance also matters. Flame alone is not the mechanism: the engine must accelerate exhaust.

NOW YOU KNOW

A chemical rocket carries its reactants and sends exhaust one way to gain thrust the other way, even in a vacuum.

Why throw part of a rocket away?



Maya studied a model with detachable stages. "That is a lot of rocket to carry."

"Much of a launch rocket's starting mass is propellant," Dr. Rivera said. "As it uses propellant, its mass decreases. The same thrust can produce more acceleration when there is less mass to accelerate."

Many rockets also release used stages. Their empty tanks and engines are no longer useful to the upper rocket. Dropping them is like putting down an empty backpack when you no longer need to carry it. Some stages are recovered for reuse.

Getting into orbit takes more than going high. A spacecraft needs enough sideways speed to keep falling around Earth. Gravity still acts there.

"Rocket to reach space. Wheels to explore the ground," Max said. "We do not need one machine to do every job."

NOW YOU KNOW

Reducing unnecessary mass helps a vehicle. Staging is one way rockets avoid carrying empty hardware for the whole trip.

The part they did not need

Back at the workbench, Max added a tall cardboard tower to the rover. "For the beacon," he said.

The rover leaned on the ramp. Maya steadied it before it tipped.

She pointed to the tower. "Our light only has to be seen across this table. Does it need to be that high?"

They shortened the mast and fixed the light lower. They removed a decorative cardboard engine that did no useful work. Dr. Rivera helped them secure the battery low in the chassis.

The rover crossed the test ramp again. This time it stayed upright.

"Less unnecessary mass," Max said. "And a lower center of mass."

"A useful change," Maya agreed. The show was nearly ready. They still had one test left: run the whole trip with the room lights dimmed.

A VERY SHORT START TO SPACEFLIGHT

Early rockets used gunpowder in China centuries ago. In 1926, Robert Goddard launched the first successful liquid-propellant rocket. It flew for only about two and a half seconds. In 1957, a rocket placed Sputnik 1 in orbit. Many teams and many tests connected those milestones.

PAUSE & WONDER

A rocket is already in empty space. Must its engine have air outside it to make thrust?

An answer to compare with your own is on page 27.

The sunset signal

The room lights dimmed. A projected Earth appeared above the model mountains. Their dad leaned forward in the front row.

Maya checked the route. Max checked the beacon. Dr. Rivera had already checked the kit's connections and battery. Nobody had to guess whether it would work in the dark: they had tested that.

The rover started gently. Its wheels gripped the surface. It followed the longer, flatter path around the ridge. At the landing pad, Max stopped the motor. The little amber light kept glowing.

"Sunlight from earlier," Maya whispered.

"Stored in the battery," Max replied. "Working now."

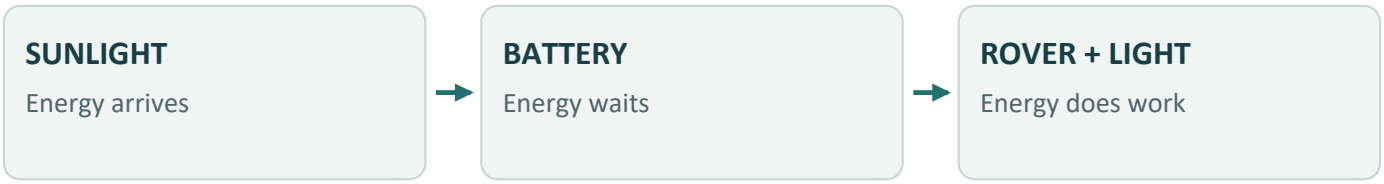
The audience clapped. But Maya kept looking at the light. That afternoon, an engine, a solar cell, an electric motor, a wing and a rocket had seemed like five separate mysteries. Now she could ask the same useful questions about all of them.

Where does the energy come from? What changes its form? What pushes on what? What does this machine need around it?

Dr. Rivera handed back their notebook. "Keep asking those questions."

Max turned to an empty page. "Next time," he said, "can we make it steer itself?"

Maya picked up the pencil.



Now you know: Follow the energy. Identify the forces. Test what the machine needs.

Design your own sunset signal

You are the next engineer. Sketch a vehicle that carries a small light around a ridge. It must work after sunset. Explain your choices with ideas from the story.

MY VEHICLE IS CALLED _____

SKETCH HERE. LABEL THE ENERGY STORE, MOTOR, WHEELS AND LIGHT.

Energy starts as _____ and is stored in _____.

The force that moves my vehicle comes from _____.

One thing I would remove or change to improve it: _____.

One test I would run before the show: _____.

TRY ONE SMALL TEST

With a grown-up, roll a toy car down the same gentle book ramp three times. Record where it stops. Change only the surface at the bottom, then repeat. How does the result change? Keep the ramp away from stairs and people.

Useful words, plain meanings

Acceleration
A change in velocity: speed, direction, or both.

Circuit
A complete path through which electric current can flow.

Combustion
A chemical reaction, usually with an oxidizer, that releases heat.

Crankshaft
A rotating shaft that links piston motion to a useful turn.

Current
The flow of electric charge.

DC / AC
Direct current flows one way. Alternating current repeatedly reverses direction.

Drag
The force that resists motion through air or another fluid.

Energy
What is transferred or changed when something moves, heats up or does work.

Inverter
Electronics that convert DC into AC.

Lift
A force from a fluid, perpendicular to the oncoming flow; usually upward in level flight.

Motor / generator
A motor changes electrical energy into motion. A generator changes motion into electrical energy.

Oxidizer
A reactant that allows a fuel to burn; chemical rockets carry their own.

Photon
A packet of light energy.

Piston
A part that slides inside a cylinder, transmitting a push.

Regenerative braking
Recovering some vehicle-motion energy as electrical energy while slowing down.

Semiconductor
A material whose electrical behavior can be controlled, useful in solar cells.

Staging
Separating used rocket sections so the remaining vehicle carries less mass.

Stall
A loss of wing lift when excessive angle of attack causes widespread flow separation.

Thrust
A propulsive push, such as the force from a rocket accelerating exhaust.

Torque
A turning effect of a force.

Traction
Grip between a tire and the surface beneath it.

Weight
The gravitational force acting on an object.

For the grown-ups

Print: US Letter, actual size (100%), portrait. Use two-sided printing with long-edge binding for 14 sheets. For A4, choose Fit. White margins need no borderless printer. Grayscale is fine; diagrams use words and arrows as well as color.

Read together: Ask for a prediction, then an explanation. The fictional rover is a supervised educational kit, not instructions to work on a car or build a rocket. A real lunar rover also needs protection from temperature extremes, dust and other hazards beyond this model.

ANSWERS TO COMPARE, NOT MEMORIZE

Page 7. The spark starts the reaction; fuel stores the chemical energy that powers the engine.

Page 11. Check the complete circuit: the switch, connections and lamp. A charged battery cannot power an open circuit.

Page 15. No. Regeneration returns only some energy already in the moving rover; losses remain, and the beacon uses energy too.

Page 19. The room contains air to flow around the wing. The Moon has far too little atmosphere for ordinary wing-based flight.

Page 23. No. It accelerates its own exhaust and carries what its chemical reaction needs.

SCIENCE AND HISTORY / FOLLOW THE SOURCES

1. Car and engine basics - U.S. Department of Energy; paired with the SimpleSci Car lesson.

2. Solar cells and useful electrical power - U.S. Department of Energy; paired with the SimpleSci Solar lesson.

3. Electric motors, controllers and regeneration - U.S. Department of Energy, Alternative Fuels Data Center.

4. Lift and flight - NASA Glenn, Beginner's Guide to Aeronautics.

5. Rocket thrust and the Moon - NASA Glenn; NASA Science, Moon Facts (science.nasa.gov/moon/facts/).

History notes adapt the five SimpleSci lesson histories. The electric-car history also draws on DOE's The History of the Electric Car. Visit simplesci.net for the companion lessons. Sources checked September 16, 2026.

Reading edition v2.0. Story and characters are fictional. Story illustrations were created with AI and reviewed for this edition; explanatory diagrams are simplified, separately drawn and not to scale. No endorsement by the source organizations is implied.

What will you ask next?

Find what interests you.
See where it could take you.

Maya did not arrive knowing how to design a rover. Max did not stop having unusual ideas. They got somewhere by asking, observing, testing and changing their minds.

Those habits belong in many kinds of work. You can start practicing them long before you choose a career.

IF YOU LIKED THE MOVING PARTS

Mechanical engineers design mechanisms, vehicles and machines. What part would you improve?

IF YOU LIKED LIGHT AND ELECTRICITY

Electrical and materials engineers work on circuits, motors, batteries and solar cells. How could you waste less energy?

IF YOU LIKED FLIGHT AND SPACE

Aerospace engineers study airflow, structures, propulsion and control. What would your machine need in its environment?

My next question is...