



# ENERGY ACADEMY: THE POWER SQUAD

## What's inside:

- Important information you and your family need to know about energy and electricity!
- Energy saving tips
- Fun facts
- And more!

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# ENERGY ACADEMY: THE POWER SQUAD

*Energy Academy: The Power Squad* is a series of improvisational comedy sketches performed by two professional actors. The show teaches about resources and energy conservation. By taking your suggestions, the actors allow you to help create the show!

## Educational Concepts:

- How energy is used unwisely
- What energy and electricity are
- What energy resources are
- Ways we can use energy efficiently

# Words to Know

## Conserve

To save or use wisely

## Efficient

Producing very little waste

## Electricity

A source of energy that runs our appliances

## Energy

The ability to do work and the force that makes things change

## Non-Renewable Resource

A resource that cannot be replaced

## Renewable Resource


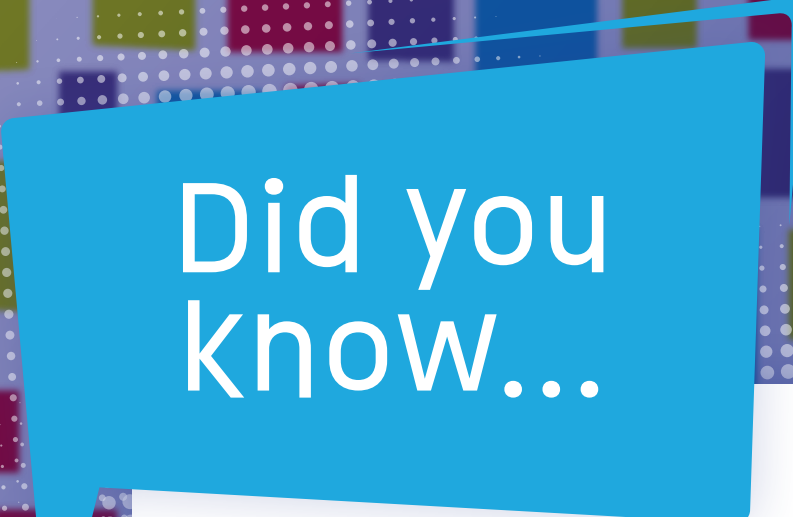
A resource that can be replaced in about the same time it takes to use it

## Resource

Things we use to make electricity, like coal, oil, natural gas, water, solar energy and wind

## Waste


To use more than necessary



# Did you know...

... that it's important to become aware of how the things we do affect the planet? It is! By taking part in the Energy Academy program, you'll learn what you can do to help make our planet greener and cleaner.

There are lots of things we all do that can waste energy and electricity without even knowing it. We take showers that are too long. We leave lights on when we are not using them. We keep our homes too cool in the summer and too warm in the winter. All of these things may seem small, but they can have big effects. Wasting energy also means wasting the natural resources that are used to make the energy and electricity we often take for granted.



So how do we begin to help prevent waste? *Energy Academy: The Power Squad* can be a first step, followed by more education and action. This playbook is intended to shed light on the importance of energy conservation and ways you can make your voice heard and help make a difference. Read it with your classmates and family to learn ways you can help make a better future today!



# Exploring Energy and Electricity



## What is Energy?

Energy is the ability to do work or make things change. It comes in many forms, like muscles powering a bicycle, the Sun giving off light and heat, and food providing nutrients. Energy is all around us and we use it every day.



## What is Electricity?

Electricity is a special type of energy that powers our homes, schools and cities. It is created when tiny particles called electrons move through a wire. We use electricity to light up rooms, power gadgets and make our favorite ice cream!

## Generating Electricity

Electricity is generated in power plants. These power plants can use various sources to create electricity. Some common sources are:



**Fossil Fuels:** Fossil fuels, like coal, oil and natural gas, are burned to produce steam. This steam spins a turbine, which generates electricity. However, burning fossil fuels can harm the environment, so it's important to find cleaner ways to produce electricity.



**Renewables:** Renewable sources, such as sunlight, wind and water, are excellent alternatives for generating electricity. Solar panels capture sunlight and convert it into electricity, wind turbines harness the power of the wind and hydroelectric power plants use flowing water to spin turbines and generate electricity. These sources are more eco-friendly and can be replenished naturally.



## Fun Fact: Energy

Energy cannot be created or destroyed. It can only change from one form to another. So, when you ride your bicycle, the energy from your muscles is converted into motion energy, making you move forward!

## Fun Fact: Dancing Sunflowers

Sunflowers follow the sun's movement during the day, a process called heliotropism. They do this to absorb as much sunlight as possible for energy. It's like they're doing a slow dance with the sun!



## Fun Fact: Human Batteries

Our bodies can generate electricity! Inside us, there are tiny electrical signals that help our heart beat, our brains think and our muscles move. We are like walking, talking batteries!

## Discover Different Energy Resources

### Fossil Fuels

**Coal:** Coal is formed over millions of years from the remains of ancient plants that lived in swamps. These plants absorbed energy from the Sun and used it to grow. When they died, their remains got buried under layers of dirt and water. Over time, the pressure and heat from the Earth transformed these plant remains into coal.

**Oil:** Oil is made from the remains of tiny sea creatures and plants that lived in the oceans millions of years ago. When these creatures and plants died, their bodies settled on the ocean floor. Over time, layers of mud and sand covered them. The pressure and heat from these layers turned the remains into a thick, sticky liquid called oil.

**Natural Gas:** Natural gas is formed in similar ways to oil. Tiny sea creatures and plants that lived in the ocean millions of years ago are the source of natural gas too. When they died, their remains sank to the bottom and got buried under layers of sediment. As the years went by, pressure and heat turned the remains into natural gas.

### Fun Fact: Time Capsules

Fossil fuels take millions of years to form. So, when we use them, we're actually using energy that was created long before humans even existed.

## Renewable Resources

**Solar Energy:** Solar energy comes from the Sun. Special panels called solar panels capture sunlight and convert it into electricity. It's like harnessing the power of sunshine to power our homes and schools.

**Wind Energy:** Wind energy is generated by harnessing the power of the wind using wind turbines. When the wind blows, it spins the turbine, which produces electricity. It's like using the invisible force of the wind to create energy.

**Hydroelectric Energy:** Hydroelectric energy is generated from the power of moving water, such as rivers or waterfalls. Water is channeled through turbines, and as it flows, it spins them to generate electricity. It's like using the force of flowing water to create energy.

### Fun Fact: Sunny Side Up

Solar energy is derived from the sun. Did you know that the amount of sunlight that reaches Earth in just one hour is enough to meet the world's energy needs for an entire year?



### Fun Fact: Dancing Wind Turbines

Did you know that wind turbines can dance? They can change their position based on the wind's direction. This helps them capture the maximum amount of wind energy and generate more electricity. It's a lot like those dancing sunflowers.

# Stop Wasting Electricity!



## Lights On, Lights Off

One of the most common ways electricity is wasted is by leaving lights on in empty rooms. Many times, we forget to turn them off when we leave. Remember to flick the switch and save energy.

**Fun Fact:** In 2021, the average monthly electricity bill in the U.S. was \$121.00.

## Open Fridge Mysteries

We often stand in front of the refrigerator, wondering what we want to eat. But did you know that keeping the fridge door open for too long wastes electricity? The cold air escapes, and the fridge has to work harder to maintain its temperature.





## Air Leaks

Poorly sealed windows and doors can let cold or hot air escape, making our heating or cooling systems work extra hard. Encourage your parents to weatherstrip doors and windows to keep the air inside and save electricity.

**Fun Fact:** By sealing air leaks, homeowners can save 15% on heating and cooling costs.

## Energy Vampires

Some appliances and electronics consume electricity even when they're turned off. These sneaky energy vampires drain power in what is called "standby mode." Unplug devices like phone chargers, gaming consoles and laptops when not in use. You could also use power strips which have switches to completely cut off the power!

**Fun Fact:** The average U.S. household used about 50% more energy per year than the average car.

## Unattended Chargers

Leaving chargers plugged in without any devices attached is another common way we waste electricity. Even though our gadgets are not connected, the chargers keep using energy. Remember to unplug chargers once your devices are fully charged.

**Fun Fact:** You can charge your phone for free by using a small portable solar panel charger!

### Sources:

[https://www.eia.gov/electricity/sales\\_revenue\\_price/pdf/table5\\_a.pdf](https://www.eia.gov/electricity/sales_revenue_price/pdf/table5_a.pdf)

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<https://rpsec.energy.gov/energy-data-facts#:~:text=The%20average%20U.S.%20household%20used,being%20on%20average%2027%25%20larger>

# Saving Energy and Electricity



Saving energy and electricity is not only good for the planet but also helps you save money. As responsible citizens, we can make a big difference by adopting simple habits. Here are some exciting tips for students, parents and teachers.

## Switch Off Lights and Electronics

Remember to turn off lights when you leave a room. Lights use a lot of electricity, so make it a habit to switch them off. Also, unplug chargers and electronics when they're not in use. Even when they're not turned on, they use energy if they're plugged in.

## Natural Light and Fresh Air

Make the most of natural light during the day. Open curtains and blinds to let sunlight brighten your space. Similarly, on mild days, open windows to let fresh air cool your home instead of relying on air conditioners. This way, you'll save electricity and enjoy the beauty of nature.



## Save Water

Conserving water helps save energy too! Turn off the faucet while brushing your teeth, and remind your family members to do the same. Report any leaky faucets or toilets to your parents or teachers, as dripping water wastes both water and energy.

## Energy-Efficient Appliances

Encourage your parents to buy energy-efficient appliances with the ENERGY STAR label. These devices use less electricity and help reduce your carbon footprint. You can also remind them to unplug chargers and appliances when not in use to save energy.



## Natural Cooling and Heating

In hot weather, use fans or open windows instead of relying solely on air conditioners. In colder months, wear cozy sweaters and use blankets before turning up the heat. This way, you can keep comfortable while saving energy and reducing greenhouse gas emissions.

## Reduce, Reuse, Recycle

Recycling helps save energy and resources. When we recycle paper, plastic and glass, we can make new products without using as much energy. Remember to use both sides of a piece of paper before recycling it, and try to use reusable containers instead of single-use plastics.

## Plant Greenery

Did you know that trees and plants help save energy? They provide shade, reducing the need for air conditioning, and act as windbreakers during colder months, reducing heating costs. So encourage your family and friends to plant trees and take care of the environment.



## Fun Energy Challenges

Make saving energy a game! Challenge your friends and family members to see who can turn off the most lights or use the least amount of water in a week. You can create charts or use stickers to track your progress and reward the winner with a special prize.



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