November 2015 Preview Issue

2025 Labs kids

the engineering and technology source for kids

www.2025kids.com

Engineering in the News™ For Kids!

NEW Magazine for Kids:

The Energy Issue

Energy sources around the world

Look inside for activities and puzzles

Power Your House... With Batteries?

On Page 16!

Did You Know?

1. This country gets more than **70%** of its energy from **nuclear power**, more than any other country in the world.
2. This country is the location of the **Three Gorges Dam**, a hydroelectric (water power) dam that is the largest power facility of any kind in the world.

Find the Facts!

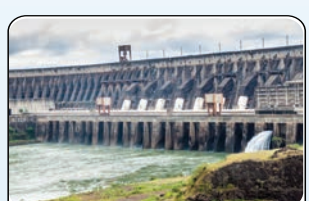
3. This **hydroelectric dam**, on the border between **Brazil** and **Paraguay**, is the second largest hydroelectric plant in the world, after the Three Gorges Dam.
4. It may surprise you that this country is currently the **biggest producer** of **petroleum** in the world, primarily due to dramatic growth in production in the states of Texas and North Dakota.

Stump Your Grown-Ups!

5. This country, well known for its **oil** production, has **16%** of the world's known oil reserves, and is the **largest exporter** of petroleum in the world.
6. This country is ranked **fourth** in the world, after China, the U.S., and Brazil, in **renewable electricity** capacity.

Tricastin nuclear power plant in France. France gets more than **70%** of its power from Nuclear Power.

Oil pump in **North Dakota**, one of two U.S. states leading the growth in U.S. oil production.



Itaipu Dam, between **Brazil** and **Paraguay**, the second largest hydroelectric dam in the world.

Energy Around The World

Wind farm in Hesse, Germany. Germany is ranked **fourth** in renewable capacity in the world.

RUSSIA

KAZAKHSTAN

MONGOLIA

UZBEKISTAN

TURKEY

CHINA

SYRIA

IRAQ

IRAN

AFGHANISTAN

PAKISTAN

NEPAL

SAUDI ARABIA

INDIA

BURMA

OMAN

SUDAN

YEMEN

THAILAND

VIETNAM

ETHIOPIA

INDONESIA

UGANDA

KENYA

SOMALIA

TANZANIA

MALAWI

ZIMBABWE

MADAGASCA

AUSTRALIA

NEW ZEALAND

Three Gorges Dam, China, the **largest** power facility of any kind in the world.

Saudi Arabia is well-known for oil production, with **16%** of the world's proven oil reserves.

Solar Power Overload in Hawaii

The mainland U.S. is covered by three connected electric grids. But, each Hawaiian island has its own disconnected mini-grid.

Hawaii is the only state that burns **oil** for most its electricity. Oil is **1%** of grid supply for entire US, but accounts for **70%** of Hawaii's.

12% of Oahu's utility users have rooftop solar, compared to the U.S. average of less than **1%**.

The state of Hawaii has traditionally imported and **burned oil** for its energy needs. In fact, Hawaii is the **only** state that burns oil for most of its electricity.

However, importing oil has made Hawaii's electricity very **expensive** for people to use. As a result, many people in Hawaii have installed **solar panels** on the roofs of their homes. As a matter of fact, a higher fraction of households have installed solar panels in Hawaii than in any other state!

A household with solar panels generates its **own electricity** from the panels during the day when the sun shines. But the houses need electricity from elsewhere overnight when there is no sunshine. Typically these homes are connected to the electric **grid** and use electricity from the grid overnight. When these grid-connected homes are generating more electricity than they need, the **extra electricity** flows to the electric grid. That electricity flow onto the grid is creating big problems for Hawaii's electric utility company.

Hawaii's electric company is having trouble keeping a **steady supply** of power. The electric grids were designed to carry power from generating stations to households and businesses. They were not designed to receive electricity back.

Renewable energy sources are **volatile** (constantly changing). People do not control the sun or wind. The weather can change suddenly. Sunny weather can turn cloudy, affecting the amount of solar power generated. A still day can turn quite windy and generate a sudden **burst** of electricity from wind farms and wind turbines.

When many energy sources suddenly have excess energy, a lot of electricity can flow onto the grid. The grid was **not designed** for sudden electricity input from unplanned sources. The result can be **overloaded equipment**, equipment damage, and power **outages**. The utility may not even know how much power is coming in to the utility at any given moment.

Hawaii has **unique** challenges. The mainland U.S. has three large, interconnected electricity grids. In Hawaii, each island has its own mini-grid. It is harder to balance **supply** and **demand** over a small grid with such great variation in the energy supply. The way grids have been designed, supply must match demand, and otherwise overloaded circuits could become damaged. Not enough supply could cause a **blackout**.

Because of the issues that the Hawaii electric utility is encountering, some households have been told not to turn their solar power on, or not connect it to the grid.

Some utility customers have already paid to install solar panels but **cannot use** them. They are still paying high electricity costs, even though they have solar panels already installed.

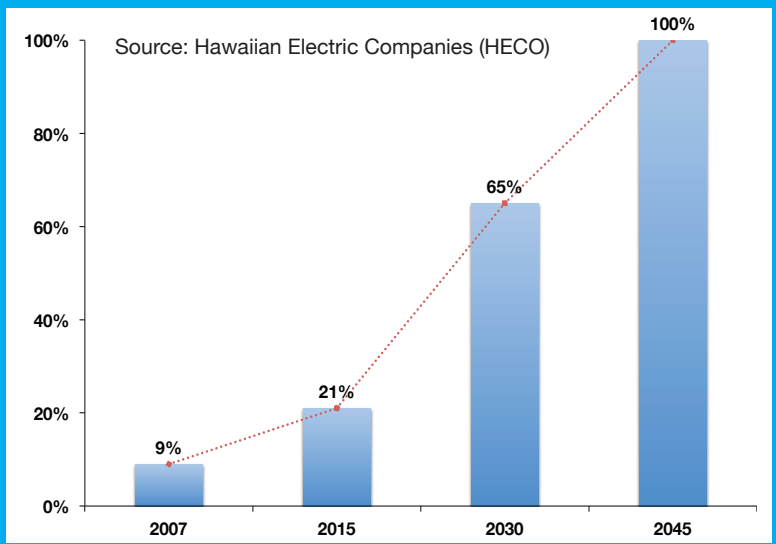
People who borrowed money to install the panels may be paying off those loans while also still paying for all their electricity from the grid. So, instead of saving money on power, they have **doubled** their energy **expenses**!

Now, solar companies are

looking to sell **solar plus battery** solutions, so that households can avoid grid restrictions and approval requirements in Hawaii. See our ***Power Your House ... With Batteries?*** article to learn more about how that works.

Many people think that Hawaii is a **preview** of what the rest of the nation – and world – could be facing as more and more energy comes from **renewables**.

Hawaii law requires **100%** renewable energy sources by **2045**



Currently **21%** of Hawaii's power comes from **renewables** – such as wind, or solar.

Utilities cannot control when the sun shines or the wind blows. So, the grid can have sudden changes in the supply of electricity from wind and solar power sources.

*See the **Power Your House ... With Batteries?** article on Page 9 for information about how people can use solar power with batteries to avoid the grid entirely!*

Grid upgrades may be necessary. Among other things, people are looking at **Smart Grids** that allow the houses and electric grid to share information and control electricity flow between them.

Hawaii's electric utility is also looking into **energy storage**, so that excess supply can be stored and saved for times of lower supply. However, it will be a challenge to figure out a way to pay for grid upgrades that fairly shares the cost burden with both solar customers and non-solar customers.

What Caused Hawaii's Problems?

Many people installed rooftop solar panels. The grid was originally designed to send electricity out to homes and businesses – not to receive it back.

If lots of homes in an area have rooftop solar, the local substation can get overloaded when it turns sunny. That can cause equipment damage.

* Sources include the U.S. Energy Information Association (eia.gov) and the Hawaiian Electric Companies (HECO).

The Grid

The Grid

We don't normally think about where the energy comes from when we plug in a toaster, but the energy comes from the **electric grid**. When you drive around town, you probably see power lines that deliver that electricity from the grid to businesses, homes, schools, and hospitals.

Birth of The Grid

The electric grid is the way that we connect energy sources with places that need energy, like homes and businesses. The electric grid was created in the early **1900s** to make the movement of energy around the U.S. more **efficient**. Demand for energy was increasing. Companies found it easier to **connect** their systems to provide electricity to people. Lots of electric transmission lines were connected to each other, giving people better access to electricity.

Transmission lines carry the electricity for long distances, while **distribution** lines carry electricity small distances within neighborhoods.

The result of these companies connecting their lines is the **three grids** that combine to make the U.S. mainland electric grid. The two larger grids are called the Eastern Interconnection and the Western Interconnection. The smaller grid is called the Texas Interconnection. Alaska and Hawaii are not connected to these mainland grids. You can read about Hawaii's grid infrastructure in the **Solar Power Overload in Hawaii** article.

Transformers

Transformers allow electricity to be moved efficiently. When you see large power lines next to roads, they are carrying electricity at an extremely high **voltage**.

Voltage is a measure that relates to how much electric current is moving through a wire or device. The higher the voltage in a wire, the more power you get out of it, and the more efficiently power can be transmitted. This means more of the electricity makes it to the final location. Therefore, when we are moving electricity around the country, we are doing so at a much higher voltage than is safe or possible to use to power our items in our home.

We use **transformers** to change voltage levels between the levels that our homes use and the levels that transmission lines use. Transformers allow for the voltage to be increased or decreased. Transformers increase the voltage after it is generated at a power plant and decrease the voltage before providing the power to homes. These transformers are located at electrical substations, on power poles, and in boxes connected to power lines in every neighborhood across the country.

AC/DC Wars

There are two types of electric current: alternating current (**AC**) and direct current (**DC**). The energy that the grid provides is alternating current (AC). But the pioneers of our national electric grid fought over whether it should be AC or DC.

Transmission lines carry the electricity for long distances, while **distribution** lines carry electricity small distances within neighborhoods.

The battle around AC and DC currents is called the **War of the Currents**. It was waged between two of the foremost inventors of the industrial age: Thomas **Edison** and George **Westinghouse**.

In the late 1880s, the widespread use of electricity was just beginning. Thomas Edison had just patented the incandescent light bulb, which needed electricity. **Patents** give inventors the exclusive rights to an invention for a limited period of time.

In order for people to buy and use the newly-invented light bulbs, electricity had to be distributed from where it was created, in **power plants**, to where people would use the light bulbs, like homes and businesses. But, there were disagreements over how this electricity should be carried.

Edison held many important patents for the distribution of **DC** power. George Westinghouse acquired critical patents for the distribution

Smart Grid

What is a Smart Grid?

A **smart grid** is just what it sounds like – an electric grid with some smarts built in! In a smart grid, electric customers such as households and businesses, and the electric utility companies **communicate** with each other to monitor and change electricity supply and demand on the grid. The ability for customers and utilities to communicate, plus smart sensors on the grid, are what makes a grid **smart**.

of **AC** power from an inventor named Nicola **Tesla**. George Westinghouse was a very successful engineer and inventor. He was also interested in the distribution of electricity.

Edison tried to show that AC power was **dangerous** because of the high voltages involved. However, AC power quickly outpaced DC in the race for the distribution of electricity, primarily because it was more cost effective. Transformers allowed AC current to travel at high voltages on smaller, less expensive wires, and then be stepped down (decreased) to a safe voltage for usage. Because AC could travel farther more efficiently, users of power could be farther away from power sources, which helped use of electricity to grow quickly.

So, George Westinghouse **won** the War of the Currents. And, AC became the standard on the electric grid.

1. 

Power Sources

A power plant generates the electricity. There are over 7,000 power plants that are currently connected into the US mainland electric grids.

2. 

Transformation to High Voltage Power

A transformer prepares the electricity to be transmitted through electrical lines by stepping up (increasing) the voltage.

3. 

Transmission

Over 450,000 miles of transmission lines carry the electricity around the United States to the needed location.

4. 

Transformation to Lower Voltage Distribution

Another transformer prepares the electricity for use by houses by stepping down the voltage

5. 

Distribution

Distribution lines carry the electricity the final distance to houses and businesses.

6. 

Transformation to Household Power Level

One last transformer steps down the voltage of the electricity before it enters homes to make it 120 volt AC.

7. 

Ready For Use!

Electricity is carried throughout the building and powers all things that are plugged into the walls.

The grid brings energy to your house through a multi-step process, starting with generation at the Power Sources, and finishing at your home.

Read more about energy and the electric grid at: www.2025kids.com

Next time you plug something in at your house, think about the trip the energy had to take to get to you. It could have come hundreds of miles to power your TV, microwave, or game console!

Power Your House...

Over time we are using up our **non-renewable resources**. Non-renewable resources are those that do not replace themselves as fast as we use them. These sources include **fossil fuels** like oil, gas, and coal. These energy sources are so important to us, but they will not last forever. We have to start using more renewable types of energy that will not run out. Renewable energy sources are things like wind and sun. Lots of engineers and scientists have been working to solve the hard problem of replacing fossil fuels with renewable energy sources.

One company that started people talking about this issue is Tesla. Tesla has one solution using **solar energy**.

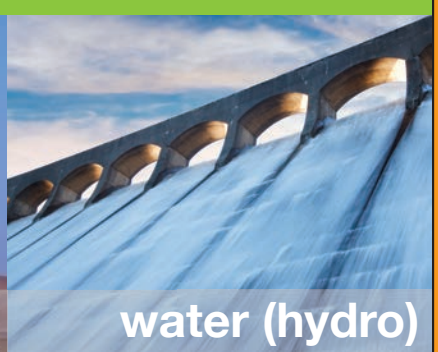
Tesla is a company run by engineer and businessman Elon Musk. Tesla is known for creating and selling electric sports cars. Recently Tesla entered into the home energy business to bring energy to the electric outlets in your house. They created **household batteries** to work with solar panels and store **extra** solar power. Their product is called the Powerwall.

One problem with solar panels is that they can only generate electricity while the sun is up. At night, in the **darkness**, they are not generating any electricity. A house with solar panels needs electricity **at night**, too. So, the house needs to be connected to the grid - or it needs access to stored energy, such as batteries.

renewable


solar


wind


water (hydro)

non-renewable

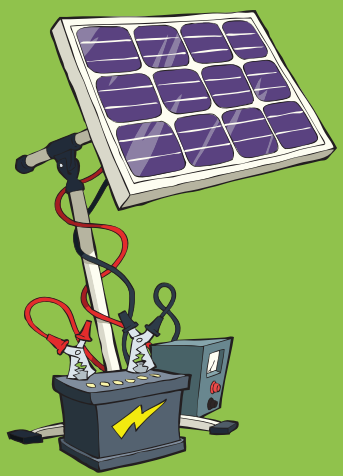

natural gas


petroleum


coal

Renewable energy sources include solar, wind, water, and geothermal (not shown) power. Non-renewable sources include coal, petroleum, and natural gas. Non-renewable sources are called “fossil fuels” because they come from ancient living things buried in the ground millions of years ago.

With Batteries?



Tesla is only one of the companies making **batteries** to store extra solar energy. The batteries charge from power generated by **solar panels** on the roof. The solar power can power the home during the day, while the batteries also **store energy** to power the house after the sun goes down. Tesla's battery is very thin and can be put right on a wall. It is designed to be easily connected to solar panels already on homes, and to look nice at the same time.

Have you ever been in a home when the **power goes out**? You may have to go hours without light, air conditioning, heat, or power to your electronics. Since these large home batteries store energy, they provide a way for your house to get power when electricity from the grid is out. If the grid power gets turned off, the batteries can step in and **power your home**. The batteries allow you to keep using all the things you need.

However, the batteries still need to be connected to solar panels in order to continue generating electricity. If we want to start using more renewable energy, we must be willing to buy not only batteries, but solar panels as well. Solar panels do take up space, but they can be put on top of buildings so they do not take up space on the ground. In fact, an area only a bit bigger than **California** would be needed to power the **entire world** using solar power.

One issue with solar panels on houses is that people do not know how much sun their roofs actually get. Therefore they do not know how much power they would be able to get by putting solar panels on their roof. Google is helping to make solar storage easier by starting something called Project Sunroof. Project Sunroof will use Google Maps pictures to calculate **how much sun** will hit your roof top over the course of a year. They look at everything from the size of the **roof** to the **shade** on the roof to **weather** patterns in the area. After you see how much money you can save by putting the panels on your roof, Google can also help connect you with local businesses that can install solar panels on your house.

No matter the problems that lie ahead in changing our world to use more renewable energy, battery and solar innovations are a great step. They offer a way for people to remove themselves from the **energy grid** and not rely on others for energy. They are also letting solar power become easier to use and easier to store.

Interested in reading more about the energy grid? Check out our website at: **www.2025kids.com**!

Project:

Morse Code Transmitter

Before You Start

1. Gather all your materials. Ask for a grown-up's help to get everything you need.
2. Make sure you have an adult around to supervise (and maybe learn from you!)
3. It make take a few tries to get it to work, and you might need to figure out some problems. See the Common Mistakes bubble below for hints. In engineering and life, things often don't work out the way you want the first time, so keep trying!

You Need:

- 2 AA batteries
- 2 AA battery holder with wire leads
- Ordinary tape
- Two small (1.5" x 1.5") squares of tin foil
- Cardstock
- 8.5" x 0.5" strip of paper
- Aluminum foil
- A piece of cardboard to make your circuit on

The electronics pieces below can be found online or at any electronics store:

- A 100 ohm resistor. We used one from a 100-pack of these (since we use a lot!)
- An LED (light-emitting diode). We used a Linrose SuperBrite red LED rated 2Vf @ 20mA
- Now, you need a way to connect together the batteries, LED, resistor, and the switch you will build. There are choices. For this version, we'll use alligator clips, which are really easy to use. If you want to use wires and a breadboard, like real engineers use, see the instructions on our website at: www.2025kids.com/projects.

1 Build a Push-Button Switch

a. Cut a piece of cardstock about 2 inches by 4 inches and fold it in half

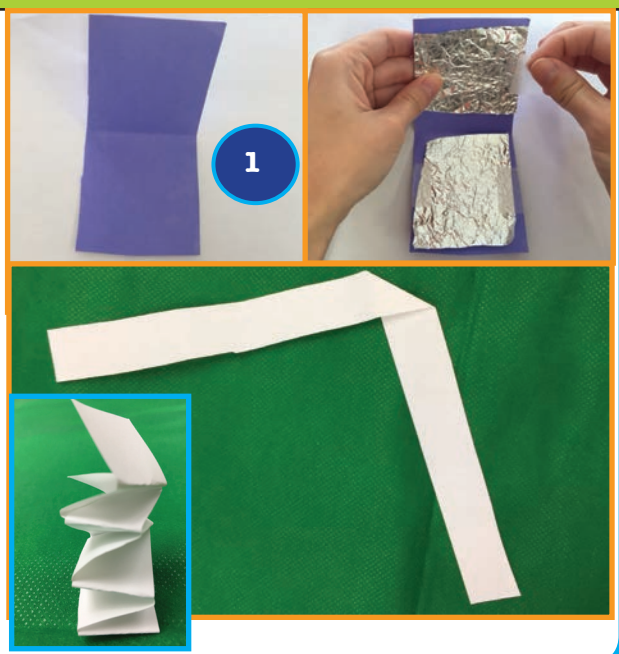
b. Cut two squares of aluminum foil, each about 1.5 inches by 1.5 inches

c. Tape one foil piece to the bottom inside of your cardstock, by rolling the tape and putting it between the foil and cardstock

d. Tape the other foil square to the upper inside of the cardstock, making sure the two foil squares do not touch

c. Build a paper spring from the strip of paper. Fold it into a V shape (see figure), and then fold the two ends back and forth into a little stack

d. Tape the spring to each side of the switch



2 Lay Out Your Circuit

a. Load the batteries into the battery holder

b. Place the battery holder on your cardboard

c. Place the LED on your cardboard, to the left of the battery holder, with the long leg bent to be near the battery holder's RED wire and the short leg bent to the other direction

d. Place the resistor to the left of the LED

e. Place the push button switch to the right of the resistor, and near the black wire lead from the battery holder

NOTE: The order of these actually does not matter. The important part is that the long leg of the LED goes toward the positive RED wire from the batteries

3

Connect Your Circuit

a. Secure the red lead wire out of the battery pack by taping it onto the cardboard

b. Secure the LED by taping a small part of the leg nearest the LED to the cardboard

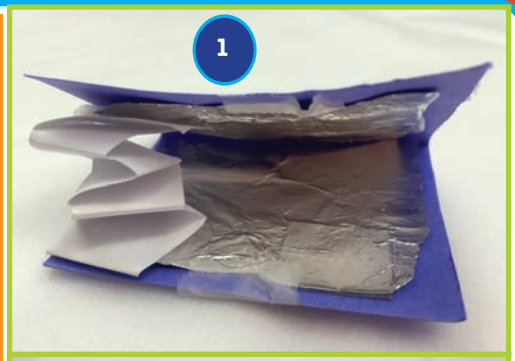
c. Use the first alligator clip to connect the red wire lead from the battery holder to the long leg of the LED

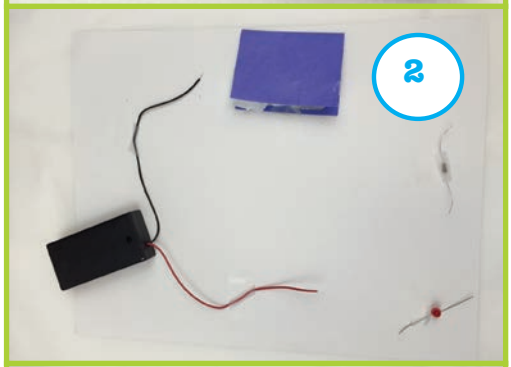
c. Secure the resistor by taping it over the middle.

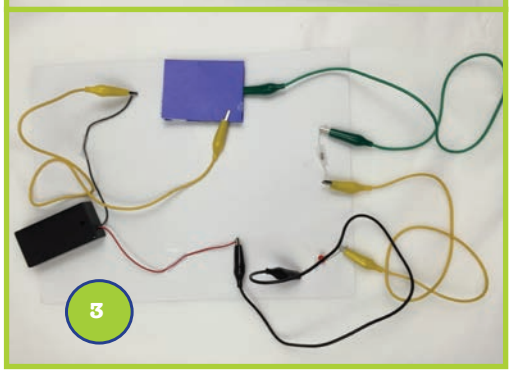
d. Use the second alligator clip to connect the resistor to the short leg of the LED.

e. Connect the third alligator clip to the other side of the resistor. Clip the other end of the alligator clip to the bottom of the switch, making sure that the metal of the alligator clip is connected directly to the foil on the bottom of the switch.

f. Use the fourth alligator clip to connect the black lead of the battery holder to the top of the switch.







4

Test Your Circuit

a. Your circuit elements should look a bit like a circle. Verify each step from above to check your circuit before testing.

b. Press down on your switch. Does your LED light up? If not, double-check your wiring and the LED's direction.

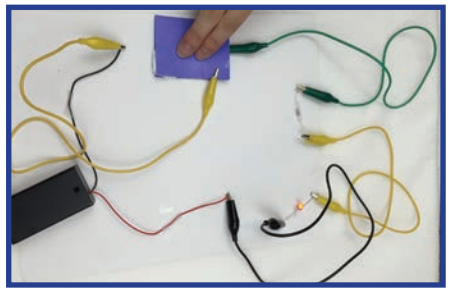
c. Exchange messages with friends, starting with "S O S." In order to send and receive messages effectively, use a signal after each letter to ensure that they understood the letter you sent. They can use the same circuit to send back one flash of light, meaning "I understood, send the next part" or two flashes, meaning, "I didn't get it. Please resend that letter."

d. Practice sending and receiving messages with your friends.

Common Mistakes

1. The LED is in backwards. The long leg should be toward the positive (red) battery wire.
2. Too much tape over the foil on the switch. Taping underneath the foil works better. Foil is conductive, but tape is not!
3. Poor wire connections elsewhere. Check all your connections.

For more hints, to view the video, or to order the kit, please visit: www.2025kids.com/projects



Morse Code Table

A •–	N – •
B –•••	O –––
C –•–•	P •––•
D –••	Q ––•–
E •	R •–•
F ••–•	S •••
G ––•	T –
H ••••	U ••–
I ••	V •••–
J •–––	W •––
K –•–	X –••–
L •–••	Y –•––
M ––	Z ––••

Word Search

U X N B P O W E R B L V X G O W O U W M
C T R U E V W D R Y L I X K Z A J I G N
S F Z W X X A R G O A I M Q A T N P G M
U O R S L E U F L I S S O F Q D W P V B
P G Q T S E F E B B L P C Q A S S F D X
P E T O L M D D Y E Q A A Z F G S J I H
L T Y R W L A I T N E T O P N A N P I P
Y C N A N M T P N E W V N B G N D R I E
X X G G D U P C I R T C E L E O R D Y H
J P D E R Z V Z O G D P A I A O W V T O
N P G B R I M I Y Y K R N X R I U C I X
D U I V E D D I B Q U T Q H G I G Y C M
N N C G S V E B Z T Z G D V E K K H I K
E D I I E E M S A D K C A S Y R Q D R G
X V T I B V A N J R H T W R J A Y Y T O
Y R E O S P N E V T J Z E A Q L A O C A
K L N T Y T D I Z I V T B X E O V N E L
P G I E D Y R S D W T C Y I P S X P L T
M J K V M V E L B A W E N E R L I K E K
A Z B S R Y X O B I G Z A T J Z K Q K S

solar
grid
turbine
battery
power
hydroelectric
supply
demand
electricity
potential
energy
wind
storage
fossil fuels
renewable
oil
coal
natural gas
kinetic

Test your knowledge!

1. A company made the news lately with batteries that could store solar energy to power a home. Better known for cars, this company was:

a. Duracell
b. Tesla
c. Sony
d. Microsoft

2. When you plug your toaster into the wall, you get power from the:

_ _ _ _

3. Electricity generated from water is called:

a. apple power
b. solar power
c. nuclear power
d. hydroelectric power

Fill in the blanks!

One day we kids decided to build a house for our toy figures to live in. We started with an empty _____ (type of container) and cut out some doors and windows. We wanted to give them lights, a radio, and a fan, and of course a _____ (fun thing for a house to have). We knew we would need to power it, so we grabbed a whole lot of _____ (objects) to use as an energy source. Every house needs a _____ (something you want in your house), so we decided to make one of those, too. We made ours out of _____ (material). We put everything where we wanted it, and even included some _____ (objects) for furniture for our characters.

Then, we plugged in the power source, and guess what happened? The lights _____ (past tense verb), the fan _____ (past tense verb), and the radio _____ (past tense verb)! Can you believe that? No kid has ever built a house as _____ (adjective) as ours! We showed our parents – they were _____ (past tense emotion). My mom said _____ (anything your mom might say), and my dad said _____ (something your dad might say). The next house we build will definitely include a _____ (object)!

Illustrate your story!

It's Material

Unscramble the words to identify the materials below!

1. LSETE

_ _ _ _ _

This very strong material is iron with just a little carbon.

2. UBERBR

_ _ _ _ _ _

This stretchy material is useful for things like tires, balls, hoses, and balloons.

3. SLAGS

_ _ _ _ _

This popular material is made from silica, the main ingredient in sand.

4. SLAITNESS TEESL

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

This material is a type of one of these other materials, but with the addition of an element to prevent staining.

5. DSNA

_ _ _ _

This familiar material is mostly made up of silica, which is useful for glass – but also for silicon chips used in computers.

6. ALOC

_ _ _ _

This material is carbon, often from long-dead plants. It is useful in a barbeque – and can be used to make steel. Under enough pressure, it could become a diamond!

7. CRONTCEE

_ _ _ _ _ _ _ _

This material has been made for thousand of years and you can find it in ancient Greek and Roman structures.

8. CPASTIL

_ _ _ _ _ _ _

This material is actually a category of materials that are man-made and can be molded into different shapes.

9. ODOW

_ _ _ _

This material from trees has been used by people for a very long time for building things, burning, making tools, and more.

Cipher Time

Fascinating Facts: Morse Code!

In the 1800s, scientists made discoveries about how electricity and magnetism are related. They were experimenting on wires carrying electric currents.

They learned that a wire carrying a current has a magnetic field. They also learned that a changing magnetic field can induce an electric current.

Samuel Morse figured out how to use patterns in the current to convey information. We call this code Morse Code. The first national communication system used long-distance wires called telegraph wires. The first telegraph message was carried in 1844 between Washington D.C. and Baltimore, Maryland.

Gugliemo Marconi began experimenting with wireless telegraphy in the late 1800s and managed to send a signal - a single letter s - across the Atlantic Ocean in 1901. Marconi's company became well established selling wireless telegraphy "radios." It was a Marconi radio that the Titanic used to signal – in Morse Code – that it had hit an iceberg and was sinking.

Morse Code Table

In Morse Code, the "•" are called **dots**, and the "–" are called **dashes**.

The dots are short signals, and the dashes are long signals. In the old telegraph systems, these signals were heard as short or long sounds. But, you can send Morse Code using flashes of light, too.

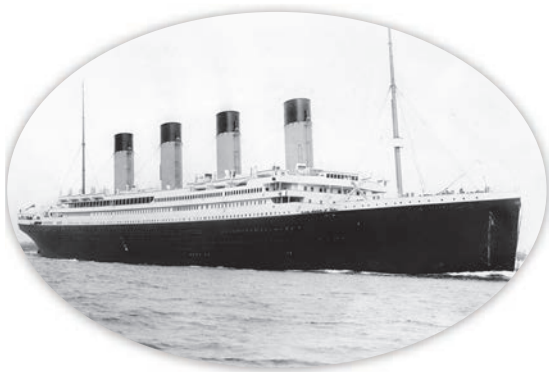
To send messages to friends, build the project in this magazine!

A	•–	N	–•
B	–•••	O	–––
C	–•–•	P	•––•
D	–••	Q	––•–
E	•	R	•–•
F	••–•	S	•••
G	––•	T	–
H	••••	U	••–
I	••	V	•••–
J	•–––	W	•––
K	–•–	X	–••–
L	•–••	Y	–•––
M	––	Z	––••

Using the Morse Code table, help Grasshopper decode part of the message the famous ship Titanic sent after hitting an iceberg.

*See back for answers

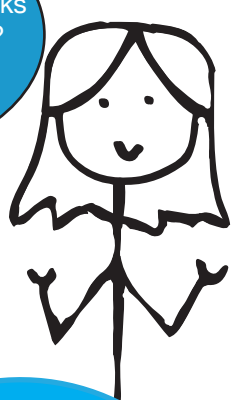
Learn more at www.2025kids.com!



RMS Titanic departing Southampton on April 10, 1912, public domain.

Trivia Question:
How many smokestacks did the Titanic have?

_____



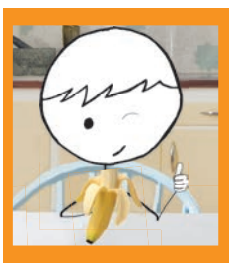
This is Grasshopper! Learn more about her online at: 2025kids.com/characters

Meet the Characters!

www.2025kids.com/characters

This issue's Featured Character:

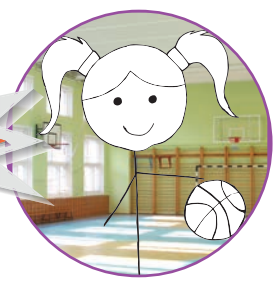
Sunny



Meet Sunny!

Sunny likes to learn about how energy is used, stored, and converted. He stores his own energy by eating bananas. He got the nickname "Banana Boy" because bananas are his favorite snack. Fun Fact: Sunny gets cranky when he's hungry!

Next issue's featured character: Ally Alloy!



Meet a real engineer!

Engineers are regular people, just like you and me. They love to solve problems and like challenges. Meet this month's featured engineer!

Name: Erin

Type of Engineering: Mechanical Engineering (machines and stuff)

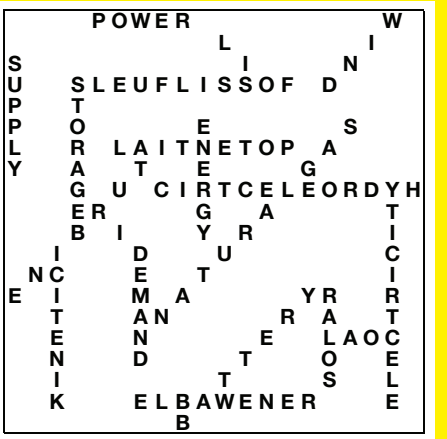
Engineering Interests: 3D printing, design, entrepreneurship (working with startup companies)

Hobbies: Photography, sewing, hiking, doing engineering projects with kids

Reason She Chose Engineering: She grew up the daughter of two non-engineers and did not know what engineers did. She just knew she loved to build and make things. It was not until high school that Erin found out engineering was the field that fit her skills and passion for creativity. Erin is passionate about making society more aware of what engineers really do and increasing diversity in the field of engineering.

You can find her: On Twitter @bcofengineering

Answers:



Test your knowledge (page 12): 1. b. Tesla 2. Grid, 3. d. hydroelectric power

It's Material (page 14): 1. Steel, 2. Rubber, 3. Glass, 4. Stainless Steel, 5. Sand, 6. Coal, 7. Concrete, 8. Plastic, 9. Wood

Cipher Time (page 15): "We are sinking fast. Passengers are being put into boats."

Cipher Time Trivia Question (page 15): Three smokestacks. The fourth was just for decoration!

2025 Labs kids
the engineering and technology source for kids

Chief Executive Officer Melissa Liu
Article Contributors Erin Winick, Melissa Liu
Art & Design Holly Garcia
Technical Review Bernadine Splettstoeszer

This 2025 Labs Kids **Engineering in the News™** magazine is a preview version of the magazine to be offered beginning in January of 2016. To subscribe to this magazine, send email to the company at: info@2025labs.com, visit the website at: www.2025kids.com, or send a written request with name, address, and payment to 455 Los Gatos Blvd., Suite 104, Los Gatos, CA 95032.

About 2025 Labs

We are a small, young company that aims to bring engineering and technology literacy to all kids and inspire a more diverse next generation of technology creators. Visit our kids' site at: www.2025kids.com, and also check out our parents' site at: www.2025labs.com.