American Innovation

activity book

AMERICA'S 250TH
1776-2026

this book belongs to:

_____

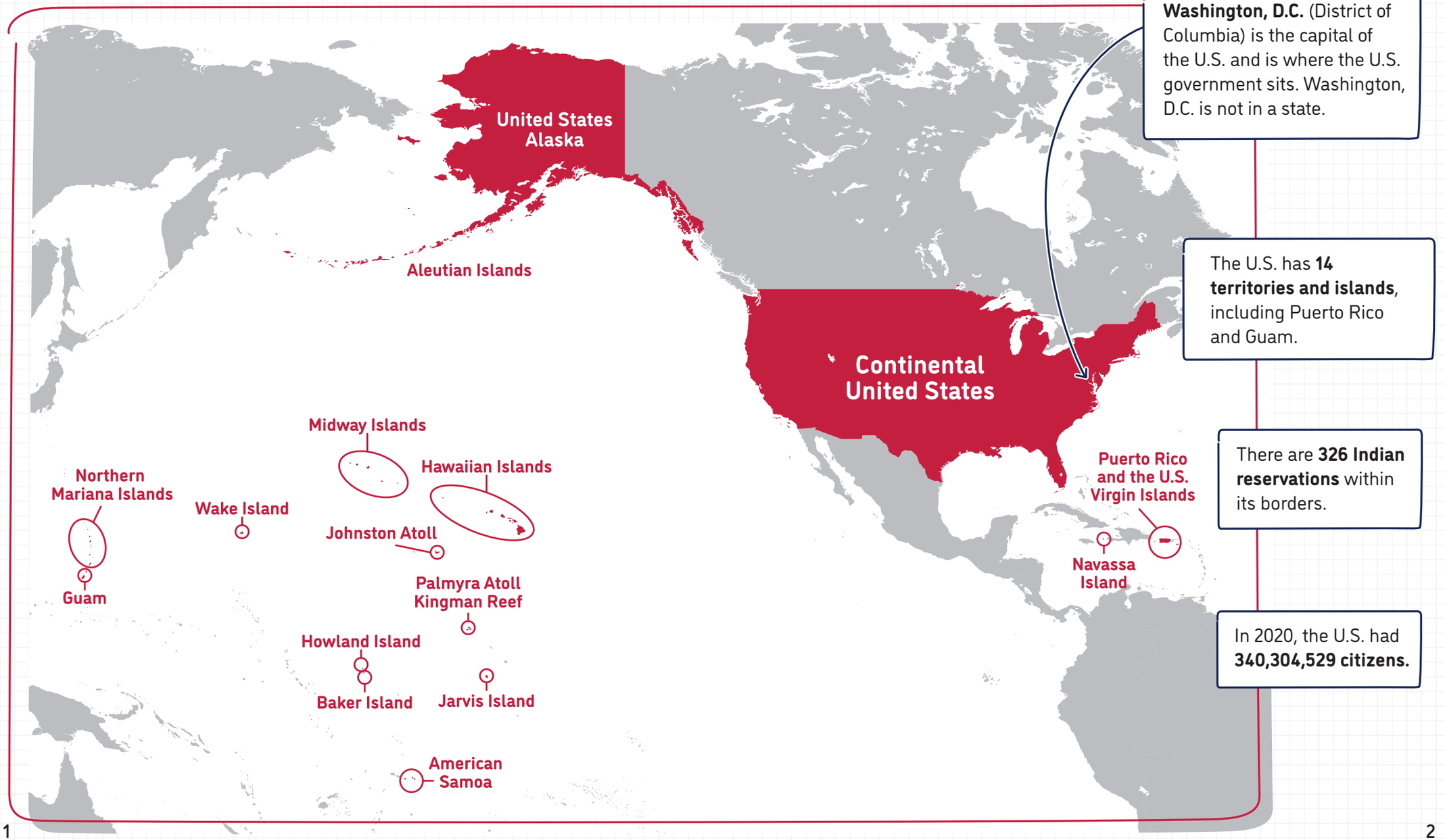
Activities

The United States of America: 250 Years of Innovation

On July 4, 2026, the United States celebrates its 250th anniversary. Let's explore and celebrate 250 years of American Innovation. What will we accomplish next?

What is the United States of America?

The United States of America, or U.S., was founded in **1776.**
The U.S. is a country located mostly in North America.
It has 50 states and a lot more!



Washington, D.C. (District of Columbia) is the capital of the U.S. and is where the U.S. government sits. Washington, D.C. is not in a state.

The U.S. has **14 territories and islands**, including Puerto Rico and Guam.

There are **326 Indian reservations** within its borders.

In 2020, the U.S. had **340,304,529 citizens.**

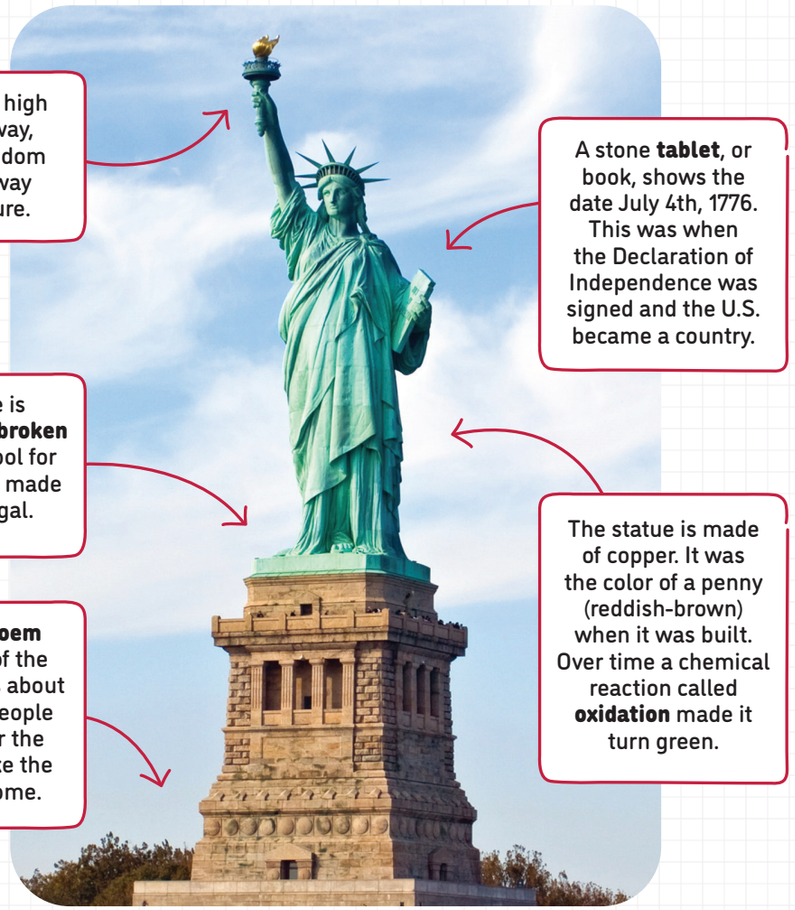
activity 1

Liberty's Torch

The Statue of Liberty is a famous statue in New York. France gave it to the U.S. as a gift.

A **symbol** is something that stands for something else. A heart is a symbol for love. The Statue of Liberty is a symbol of freedom or liberty.

Use the QR code or visit **cosi.org/americaninnovationkitvideos** for help with all activities.



A **torch** held high lights the way, just like freedom lights the way for the future.

A stone **tablet**, or book, shows the date July 4th, 1776. This was when the Declaration of Independence was signed and the U.S. became a country.

The statue is standing on a **broken chain**, a symbol for when the U.S. made slavery illegal.

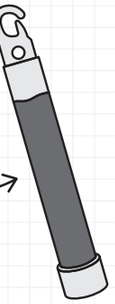
The statue is made of copper. It was the color of a penny (reddish-brown) when it was built. Over time a chemical reaction called **oxidation** made it turn green.

There is a **poem** in the base of the statue. It talks about welcoming people from all over the world to make the U.S. their home.

gather your supplies:

FROM BOX

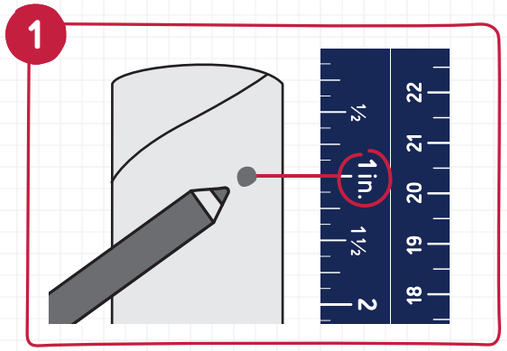
- colored pencils
- ruler
- paper tube
- scissors
- glow stick
- orange tissue paper

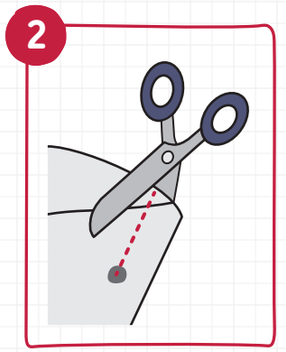


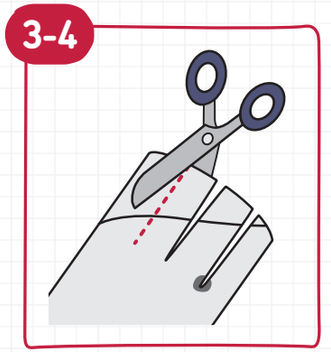
what to do:

Build your own torch!

1. Use a ruler to measure one inch (about two and a half centimeters) from one end of the tube. Use a colored pencil and draw a dot at that place.
2. Cut the tube from the closest end of the tube to the dot.
3. Make a second cut the same length about half an inch (a little over one centimeter) from the first cut.
4. Keep making the same cuts all the way around the tube.

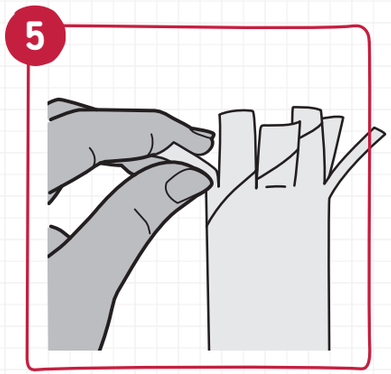


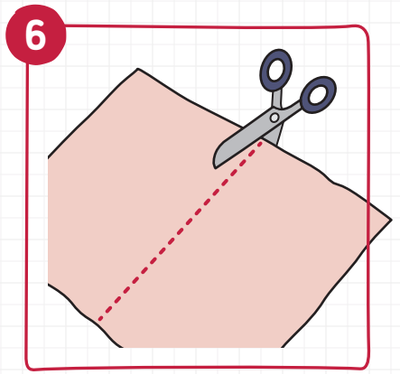


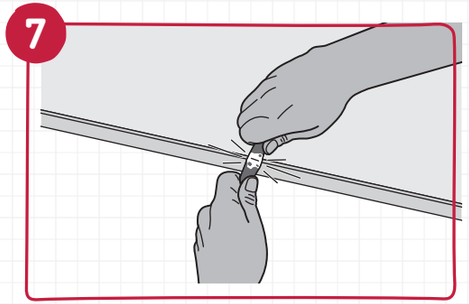


5. Bend every other piece out.
6. Cut the tissue paper in half.
7. Grasp the glow stick with two hands. Press the middle of the stick against a table until you hear it crack. When it starts to glow, shake it.
8. Put the glow stick in the center of the tissue paper and crinkle the paper around the glow stick to look like a flame.
9. Put the flame (glow stick and tissue paper) into the cut end of your cardboard tube to make a torch.

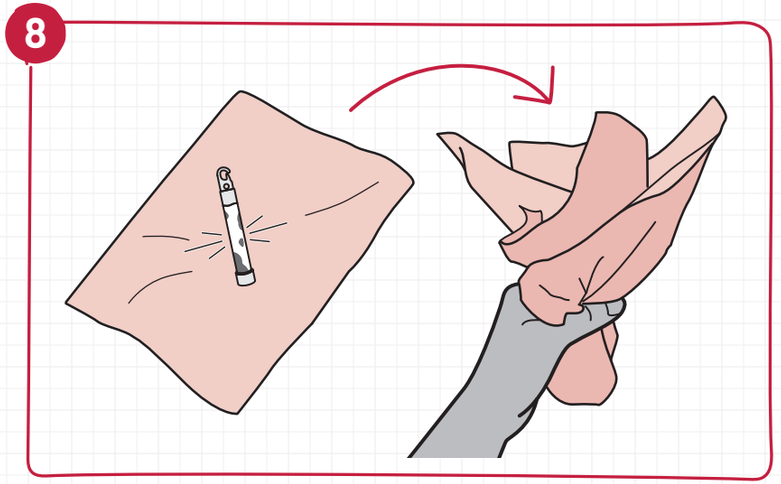
Optional: Turn the lights off and hold your torch high with pride!

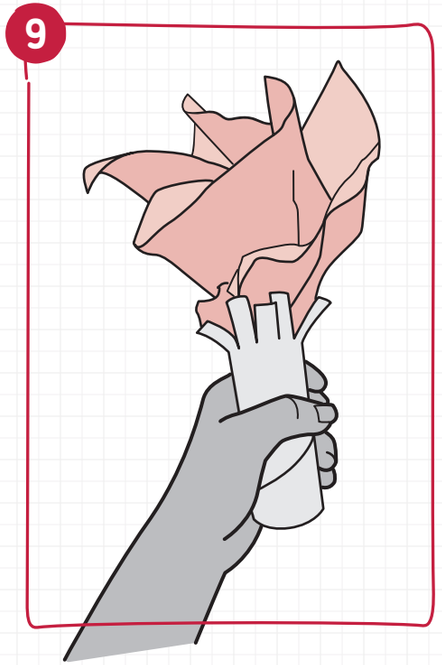






Imagine yourself as an **architect**! Architects design buildings and places for people to use and enjoy.





Challenge: Can you make your torch even better? Try using the colored pencils from the box, or items from home like foil, markers, or clay.

What does freedom mean to you?
Write your answer below:

Ask a friend, family member, or teacher what freedom means to them. Write their answer below:

activity 2

Inventors and Inventions

Have you ever had a really good idea for something that should exist, but doesn't?

To **invent** is to create or design something that didn't exist before. A person who creates something new is an **inventor**.
Some inventors get **patents** for their inventions. A patent is a certificate that protects an invention or idea. It stops other people from making or selling the idea without the inventor's permission.

Imagine yourself as an **inventor**! What would you invent?

gather your supplies:

FROM BOX

- colored pencils

what to do: Part 1

Match the invention with the patent title.
Many things that you use have patents. The name on the patent can be very different from the name you know. Sometimes companies change the name so it is easier to sell.

Part 1: Patent Match

1. Draw a line to match the common name to the patent name on the items on the next page.
2. Check your answers on page 11.

Patent Match: Match the common name to the patent name.

Common Name

Slip 'N Slide

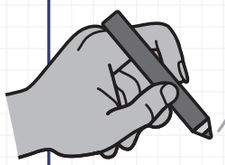
Rock 'Em Sock 'Em Robots

Twister

Video Game

Play-Doh

Yo-Yo



Patent Name

Whirlygig

Television Gaming and Training Apparatus

Toy Boxers

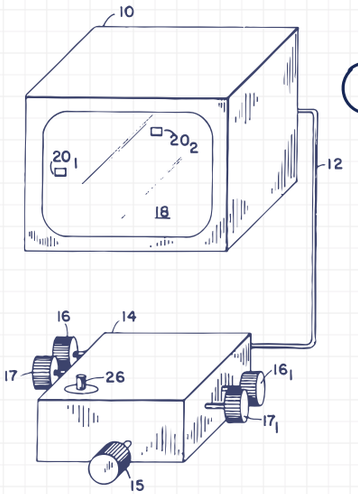
Aquatic Play Equipment

Plastic Modeling Composition of a Soft, Pliable Working Consistency

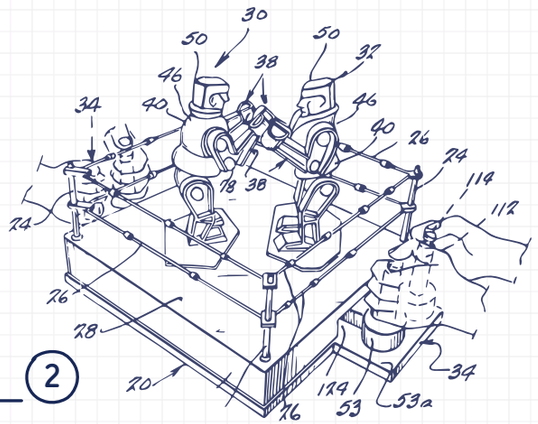
Apparatus for Playing a Game Wherein the Players Constitute the Game Pieces

Sometimes inventors add drawings to their patents to help show their ideas.

Challenge: Can you tell which common names from the Patent Match on page 9 go with these drawings? Write your guesses on the lines below.



1 _____



2 _____

3 _____

gather your supplies:

FROM BOX

- colored pencils

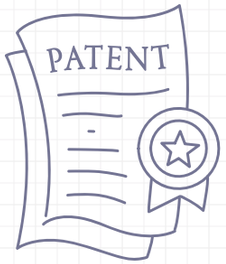
what to do: Part 2

Be an inventor!

1. Think of an invention that you would like to create. It could be something to help you in your everyday life. Maybe your invention helps you do something you couldn't do before.
2. Once you have an idea, fill out the patent sheet on the next page.
3. Find a friend or family member and tell them about your invention.

If you have a great idea for an invention, check out the Invention Convention! To learn more about patents check out COSI's EiPIC program. **cosi.org/eipic**

Patent Match (page 9) Answers:
Slip 'N Slide–*Aquatic Play Equipment*
Twister–*Apparatus for Playing...(Drawing 3)*
Rock 'Em Sock 'Em Robots–*Toy Boxers (Drawing 2)*
Play-Doh–*Plastic Modeling...*
Yo-Yo–*Whirlygig*
Video Game–*Television Gaming...(Drawing 1)*



PATENT SHEET

INVENTOR'S NAME

INVENTION/PATENT TITLE

PATENT DESCRIPTION (write what your invention is or does):

PATENT DRAWINGS (draw what your invention looks like):

activity 3

Make a Prosthetic Hand

The U.S. is known for **innovation**, or coming up with new ideas. These ideas can fix problems or make something better.

Prosthetics are human-made body parts that help people. The first ones were bulky and didn't move. Engineers have made them better over time.

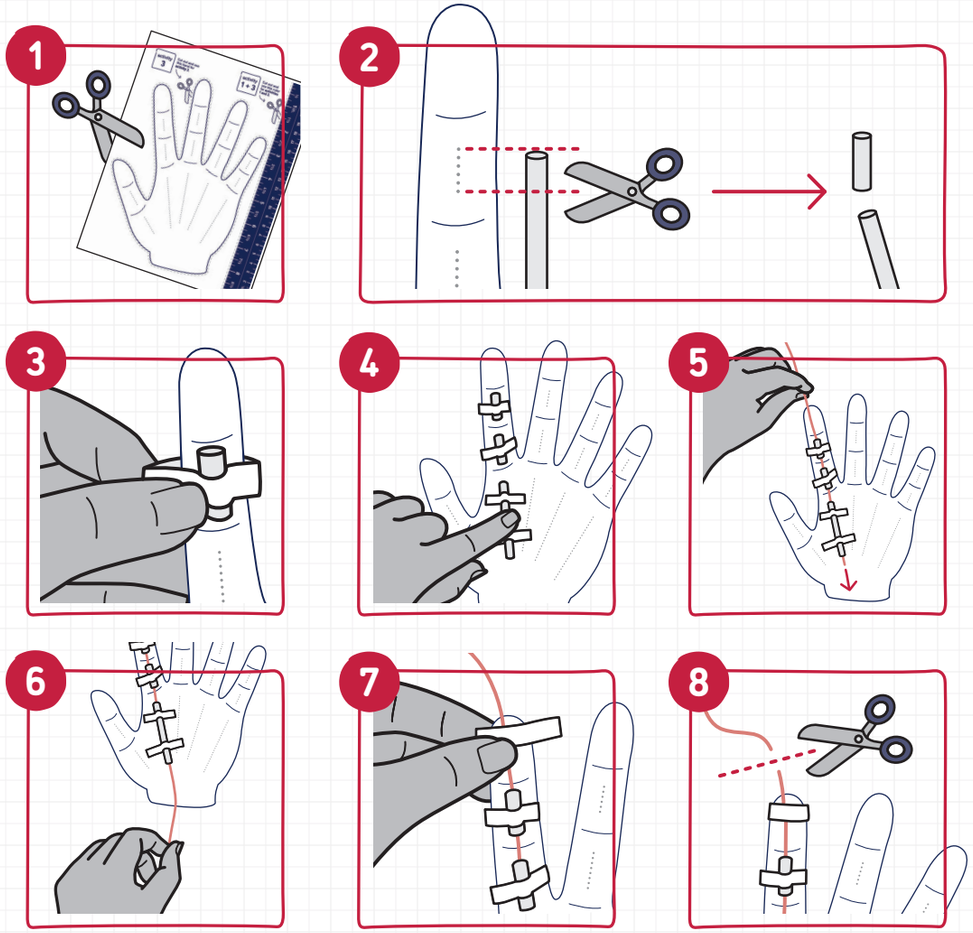
gather your supplies:

FROM BOX

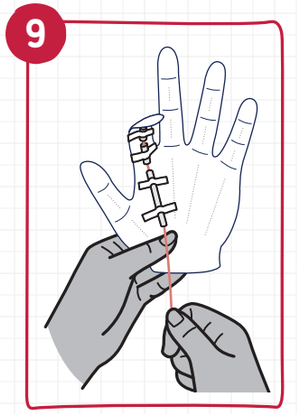
- cardstock hand
- scissors
- 4 unwrapped straws
- rectangle stickers
- plastic string
- ruler

what to do:

1. Cut out the hand shape along the raised, outside line and lay the hand line-side up.
2. Pick one finger and choose one dotted line on that finger. Cuta piece of straw to match the length of that line.
3. Use a sticker and stick the straw to the finger on the line, like a bandage.
4. Repeat steps 2 and 3 for the other dotted line on the finger and the palm of the hand. Now you have three straws in a line.
5. Push the string through all three straws starting at the fingertip.
6. Pull the string so that there are around six inches, about the length of a colored pencil, of string hanging past the bottom edge of the hand.
7. Use a sticker to tape the string to the fingertip like a bandage.
8. Cut the string above the taped fingertip.



9. Hold the base of the hand and pull the string. What happens to the finger?



Want the whole hand to work? Repeat steps 2-8 for each finger and thumb.

Pull the strings at the wrist of the prosthetic hand to see how they make it move. What happens if you pull one at a time? What about if you pull some together?

Try This!

a. Can you count using the hand?

b. Can you tape a marker to the hand and draw with it?

c. Can your hand lift something, like a cardboard tube, off the table?

Engineers keep improving things to make them better. What are some ways you can make your prosthetic hand better?

Imagine yourself as an **engineer**!
What would you like to build or design?

Making inventions better is how the U.S. moves toward the future. **YOU can innovate to make the world a better place!**

activity 4

Blast into Space

In 1969, the United States was the first country to put a person on the Moon. We are still sending people to space today!

- **NASA's Artemis missions will put the first woman and first person of color on the Moon.**
- **Astronauts from different countries live and work in space on the International Space Station (ISS).**
- **Companies such as SpaceX and Blue Origin want to make space travel an option for more people.**

Do you think humans will live and work in space someday?

Today, your mission is to launch a rocket!

gather your supplies:

FROM BOX
- packet of antacid tablets (2 tablets total)
- film canister (smaller plastic container with lid)
- safety glasses

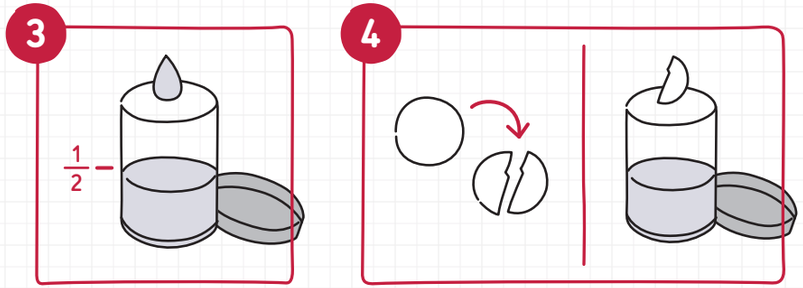
FROM HOME
- water
- optional: newspaper or towel

what to do:

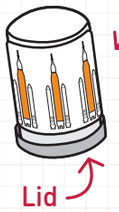
1. Cover your workstation with a towel or newspaper. Or, with an adult's permission, go outside!
2. Put on your safety glasses.

3. Fill the film canister halfway with water.

4. Break one antacid tablet in half and drop one half in the canister. What happens to the tablet and water?



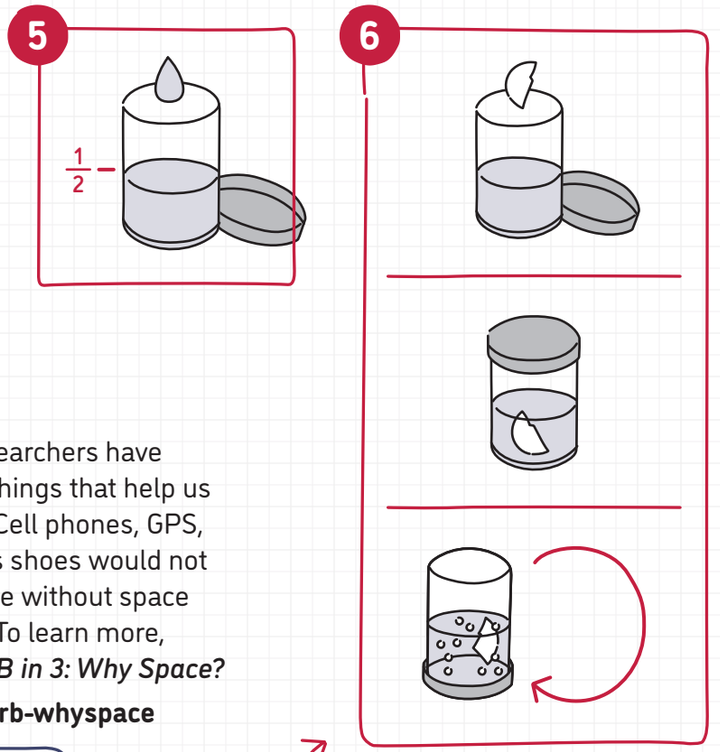
Predict: What do you think will happen when you put a new tablet in the canister and close it? Write your prediction below.



5. Empty the canister. Then, fill it half-full with water again. The canister will be your rocket. You can use the rocket sticker to decorate it, but make sure it does not touch the lid.

6. Place the other half of the antacid tablet into the canister and quickly put the lid on tightly. Place the rocket lid-side down on your work surface and back up!

7. How long does it take to blast off? Watch and listen!

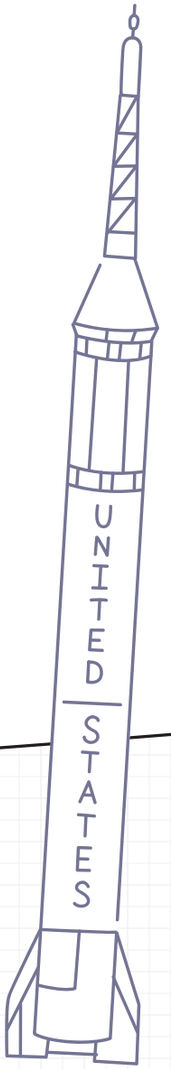


Space researchers have invented things that help us on Earth. Cell phones, GPS, and tennis shoes would not be possible without space research. To learn more, watch *Dr. B in 3: Why Space?*

cosi.org/drb-whyspace

When the antacid tablet dissolves in the water, the acid and base inside it react. They create carbon dioxide gas bubbles. Those bubbles expand and put a force on all the sides of the container. If that force gets big enough, the lid will pop off, sending the container into the air!

If you worked at NASA, where would you send a rocket? Why?



Imagine yourself as a **mission control specialist**! Mission control specialists make sure space missions go as planned.

activity 5

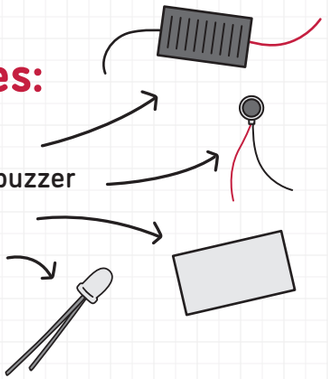
The Power of Innovation

Many people on Earth use electricity every day. In space, NASA uses **solar panels** to turn energy from sunlight into electricity. Batteries can store this energy to use at night.

Solar panel technicians build and install solar panels. Can you imagine yourself as a solar panel technician?

gather your supplies:

- solar panel
- cell phone buzzer
- plastic card
- LED bulb



what to do:

With an adult's permission, do this activity outside on a bright, sunny day.

****Be very gentle with the solar panel wires so the wires stay attached to the panel.****

1. Peel the plastic film off of the solar panel.
2. Take off the plastic (black and red coating) from the ends of the wires on the solar panel by doing these steps:
   a. Put the solar panel on a table.
   b. Put your finger about half an inch from the end of the wire and hold it in place.

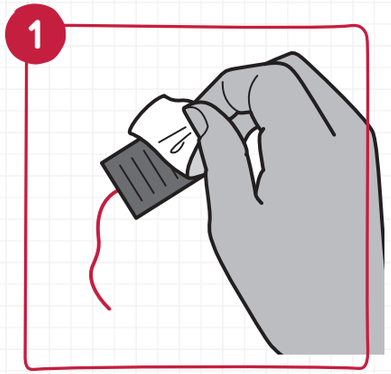
   Optional: You can use a sticker to help hold the wire in place.

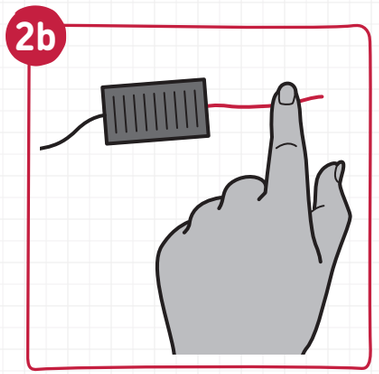
c. Use the plastic card to gently cut through the plastic coating at the end of the wire. Run the card back and forth like a saw to cut through the plastic. You can flip it over and do the same thing on the back of the wire.

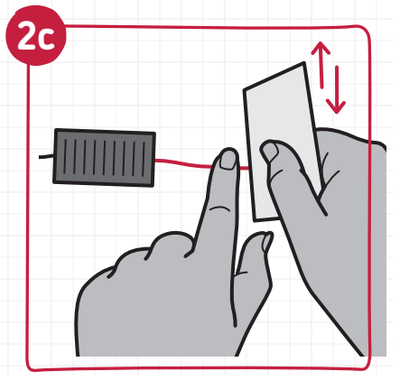
d. Gently pull the plastic coating off. You should see metal wire underneath.

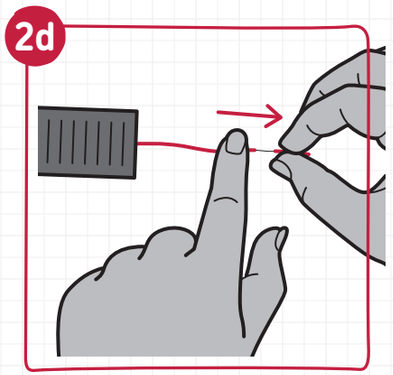
e. Repeat steps a-d for the second wire.

****If you push too hard and break or cut the metal wire, start back a little farther and try again. Be sure to cut gently.****







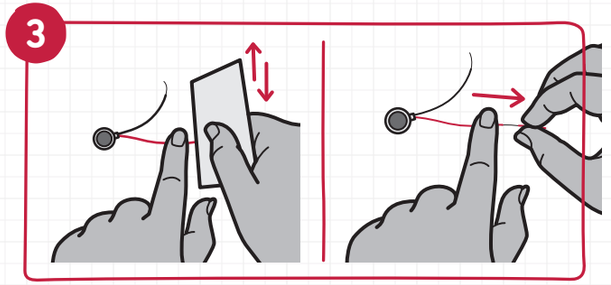


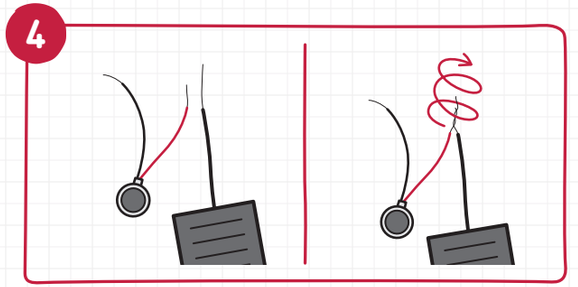
3. Repeat step 2 with the wires on the cell phone buzzer.

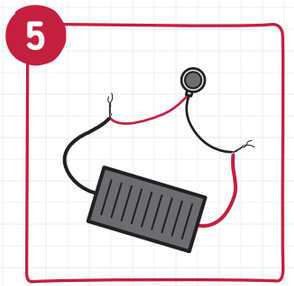
4. Hold one wire from the buzzer and one wire from the solar panel. Have the metal ends sticking up. Use your other hand to twist the two metal ends together tightly.

5. Repeat step 4 with the other two wires. You now have a **circuit** (a loop where electricity can flow).

6. Use two hands and carefully hold the buzzer and solar panel together. Take the circuit outside into bright sunlight. What happens? What happens if you move into the shade?



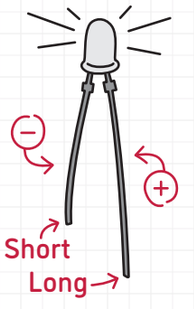




Solar panels need bright sunlight to work. Adding a battery lets us store the collected energy to use on cloudy days or at night.

Explore more!
What happens if you:

- **Put the buzzer inside a glass or cup?**
- **Tape the buzzer to a plastic or metal spoon?**
- **Connect the LED to the solar panel?**



Electricity can only flow in one direction through an LED (Light Emitting Diode). The longer wire is the positive (+) side and the shorter wire is the negative (-) side.

activity 6

America the Beautiful

The U.S. has tropical beaches, mountain ranges, caves, prairies, and deserts. Some of this land is in **national parks**. A national park is an area protected by the government. You can visit national parks. Which one is closest to you?


Glacier


Wrangell-St. Elias


Cuyahoga Valley


Arches


Virgin Islands

Olympic
North Cascades
Mount Ranier
Glacier
Isle Royale
Voyageurs
Acadia
Theodore Roosevelt
Crater Lake
Redwood
Yellowstone
Grand Teton
Badlands
Wind Cave
Lassen Volcanic
Yosemite
Great Basin
Kings Canyon
Capitol Reef
Arches
Rocky Mountain
Black Canyon of the Gunnison
Pinnacles
Sequoia
Death Valley
Zion
Bryce Canyon
Canyonlands
Mesa Verde
Great Sand Dunes
Indiana Dunes
Cuyahoga Valley
Shenandoah
Gateway Arch
New River Gorge
Mammoth Cave
Channel Islands
Grand Canyon
Petrified Forest
Joshua Tree
Great Smoky Mountains
Congaree
White Sands
Carlsbad Caverns
Hot Springs
Saguaro
Guadalupe Mountains
Big Bend
Everglades
Biscayne
Dry Tortugas

Kobuk Valley
Gates of the Arctic
Denali
Lake Clark
Wrangell–St. Elias
Katmai
Kenai Fjords
Glacier Bay

Haleakalā
Hawaii Volcanoes

American Samoa

Virgin Islands

*Alaska, Hawaii, American Samoa, and Virgin Islands are not to scale.

The U.S. had the first national park in the world, Yellowstone National Park. Yellowstone National Park has a geyser called Old Faithful. A **geyser** is a jet of hot water and steam that bursts from a hole in the ground. Hot rocks heat up the water underground, and pressure builds up.

gather your supplies:

FROM BOX

- jar
- toothpick
- 2 wrapped straws
- 2 latex balloons
- scissors

****This activity is messy and can be tricky – you can ask an adult to help****

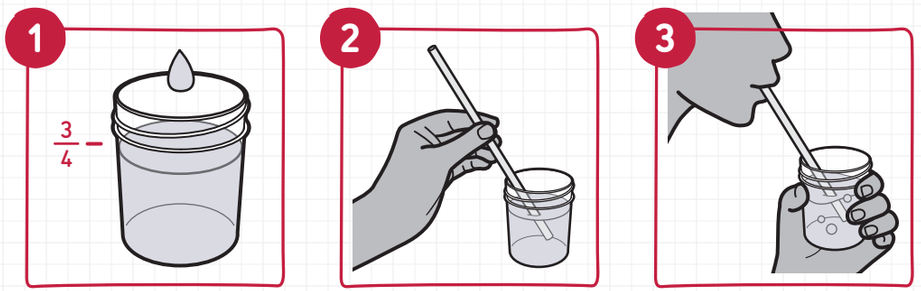
****If you have a latex allergy, please ask an adult for help. ****

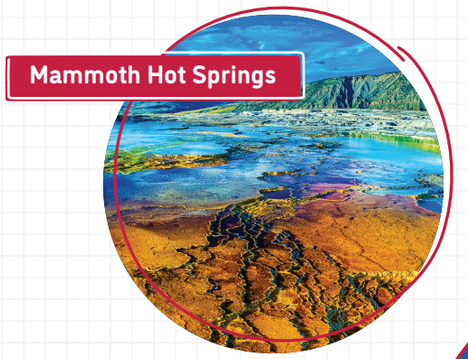
what to do: Part 1

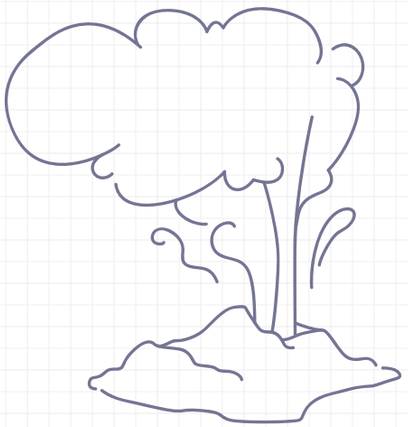
Make a model hot spring.

A hot spring is a place where water, heated by hot rocks underground, comes to the surface in pools.

1. Fill your jar ¾ full of cool water.
2. Unwrap one straw and stick it into the water.
3. Blow into your straw – what happened? This is like a hot spring. Sometimes, a hot spring gets hot enough to boil and make steam.







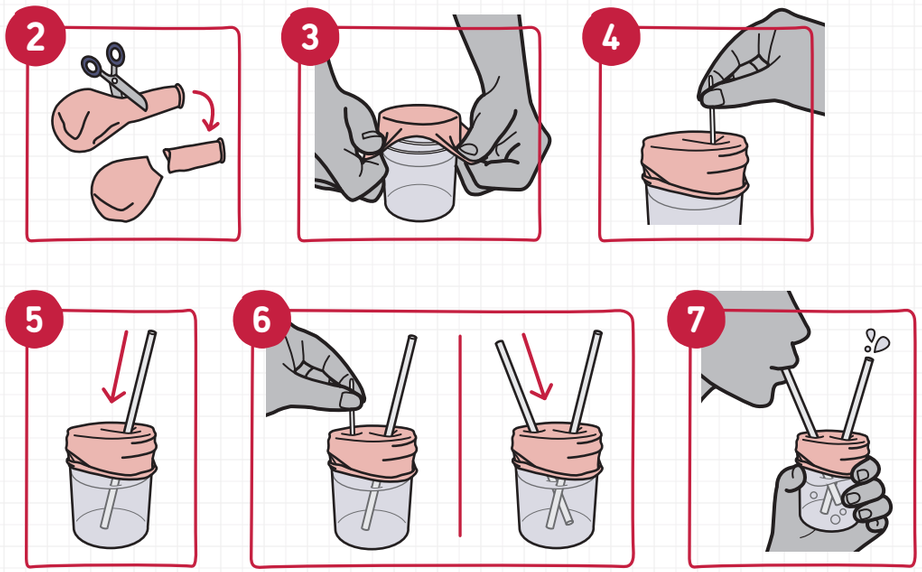
what to do: Part 2

Make a geyser.
If you add pressure to a hot spring, you get a geyser!

1. Take out the straw and unwrap a second straw. Keep the water in your jar.
2. Use scissors to cut off the narrow neck of one balloon.
3. Stretch the big part of the balloon over the top of the jar. Pull the balloon tight like the top of a drum.

The balloon represents the Earth's surface. There is water under the surface.

4. On top of the stretched balloon, use a toothpick to poke a hole near one side.
5. Poke one straw through the hole and into the water. Have an adult help if needed!
6. On the other side of the balloon, poke another hole and stick the second straw through.
7. Blow into one straw. What happens?



Didn't work? **Make sure the balloon is tight around the straws. This can be tricky; you can ask an adult to help! If the hole is too big, try your other balloon or put your fingers around the hole.**

Blowing into the straw added pressure to your model hot spring. How did the pressure escape?

Imagine yourself as a **geologist**! Geologists study the Earth and what it is made of.

PASSPORT SHEET

DRAW YOUR INNOVATOR HERE

WRITE YOUR INNOVATOR'S NAME HERE

How did they make a difference?

activity 7

Colors of Science

There are a lot of innovators in the United States and all over the world! People from various backgrounds and cultures make a difference by bringing new ideas, improving things, and helping people.

gather your supplies:

FROM BOX

- **Color of Science Passport**
- **colored pencils**

what to do:

1. Look through your Color of Science Passport to meet some U.S. innovators who have made a difference.
2. Think about someone who has made a difference in your life or helped you in some way. It could be someone famous, someone you know, or even you!
3. Draw and/or write about the person you thought of on the passport sheet.
4. Find a friend or family member and tell them how your innovator made a difference.
5. Once you've finished, share your masterpiece with COSI! You can share it on social media with the tag **@cosiscience**

All over the world, people are making a difference through their innovations. Find us **@cosiscience** on social media to see some. How will your ideas and innovations make a difference?

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