Circuits

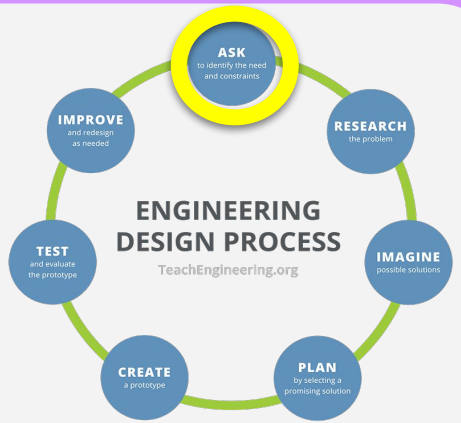
TinkerCAD and Graphite Circuits

5549 GRYPHON ROBOTICS

Brainstorm:

Example Hypothetical Need / Problem:

Your home lost electrical power, construct a device that can generate as much electricity as possible to light up your space!



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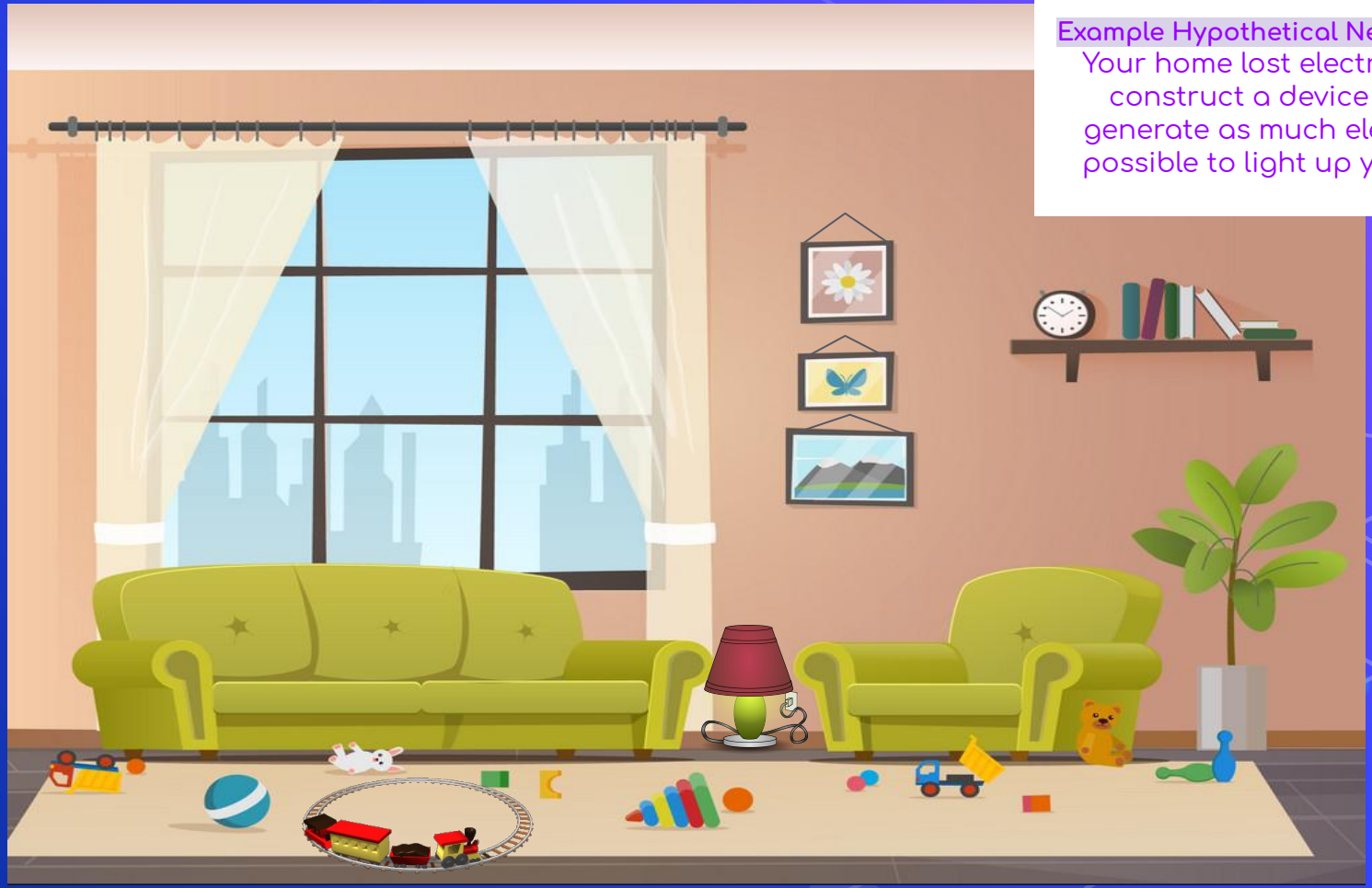
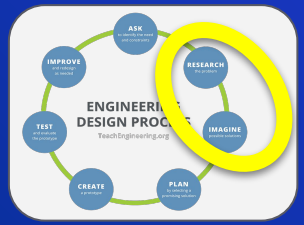


Example Hypothetical Need / Problem:
Your home lost electrical power, construct a device that can generate as much electricity as possible to light up your space!

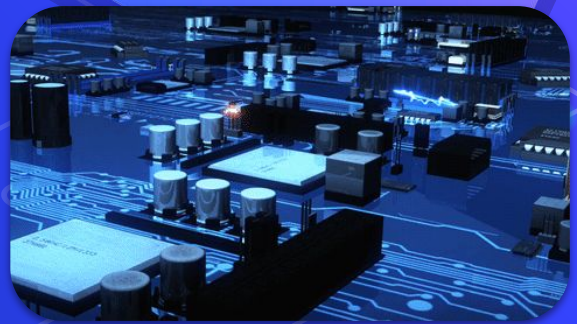
What is a Circuit?

"A complete and closed path around which a circulating electric current can flow."

➔ In other words, any path that ⚡electricity⚡ can flow through.



What is a Circuit?
Watch This!

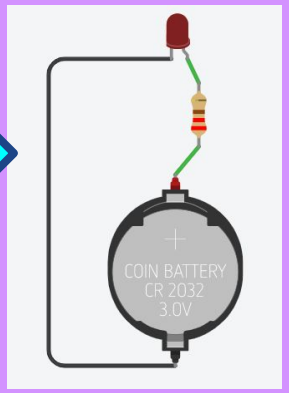
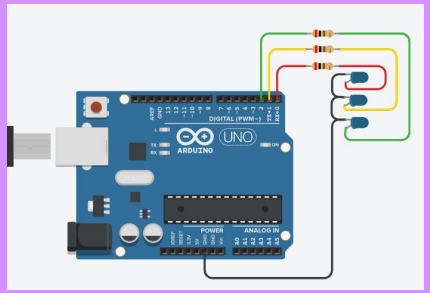
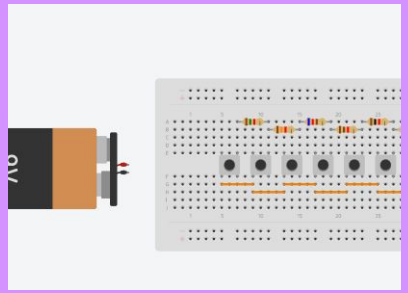
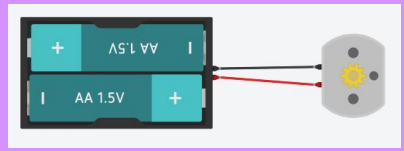


TinkerCAD

TinkerCAD - STEP 1

Materials:
- Computer
- Mouse
- Paper / Pencil

Learn About TinkerCAD for Circuits - Follow along with these steps to learn how to use TinkerCAD's circuit functions

Mini-Lesson 1 Start a Simulation	Mini-Lesson 2 Edit Components	Mini-Lesson 3 Wiring Components	Mini-Lesson 4 Adding Components
			

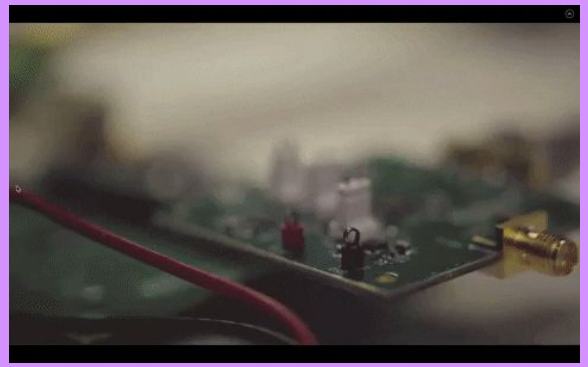
TinkerCAD - STEP 2

Draw Your Own Circuit!

Sketch it out! You can make your design as simple or as complex as you'd like. Make a few different designs and decide which one you want to work with.

Use these resources to help you design your circuit or research your own!

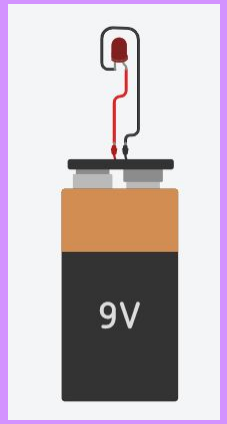
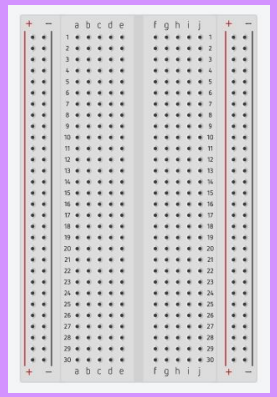
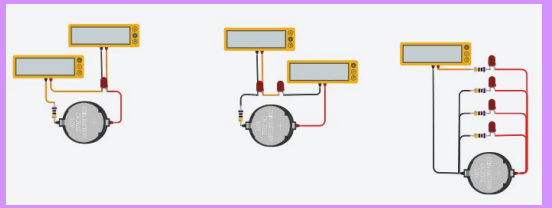
- Different Type of Circuits
- Types of Circuits
- Circuits - short video



TinkerCAD - STEP 3

Materials:
- Computer
- Mouse
- Paper / Pencil

Continue to Learn About TinkerCAD for Circuits - Follow along with these mini-lessons to learn how to properly build a circuit

Mini-Lesson 1 Ohm's Law	Mini-Lesson 2 Introducing the Breadboard	Mini-Lesson 3 Series and Parallel Circuits
		

TinkerCAD - STEP 4

Make Your Circuit!

Using your sketch you made in STEP 2, design your creation in TinkerCAD!

*You may need to make modification from your original design

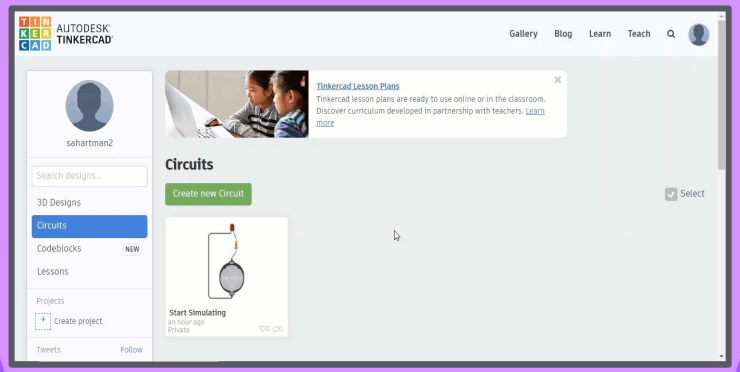
Done early? Try to solve our original hypothetical question: "Your home lost electrical power, construct a device that can generate as much electricity as possible to light up your space!"

Helpful Vocab:

- Cathode = negative charge
- Anode = positive charge

First: Go to your tinkercad dashboard and create a new circuit.

Next: Make sure your circuit has at least one power source and at least one component to interact with. Make it interesting!!

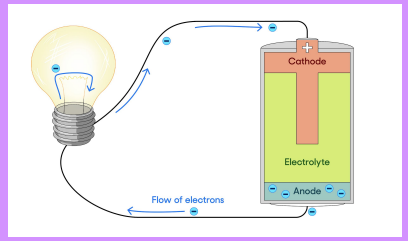
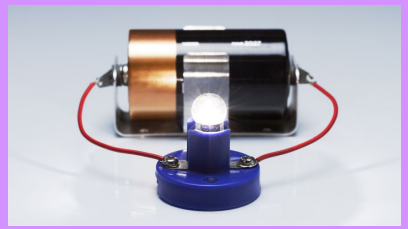
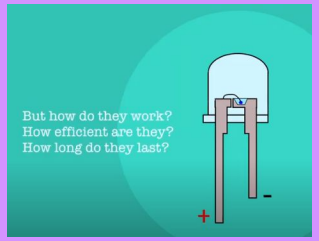
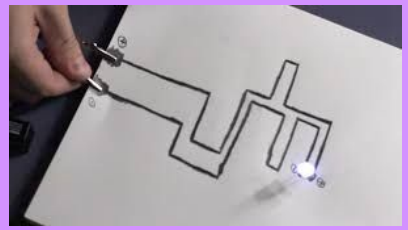


Graphite Circuit

Graphite Circuits- STEP 1

Materials:
- 1 Graphite Pencil
- Mini LED Light Bulb
- 9V Battery
- Tape
- Paper

Learn About Circuits - Follow along with these steps to learn about circuits and how to make a simple one!

Mini-Lesson 1 Read This Article	Mini-Lesson 2 Read This Article	Mini-Lesson 3 Watch This Video	Mini-Lesson 4 Read The Project Description
			

Graphite Circuits- STEP 2

Draw Your Own Circuit!

Sketch it out! Try to keep it simple at first, start with basic small shape. You can draw what looks like a circuit, or just an shape. Remember to draw your lines really big and thick and keep space for your battery and LED to go!

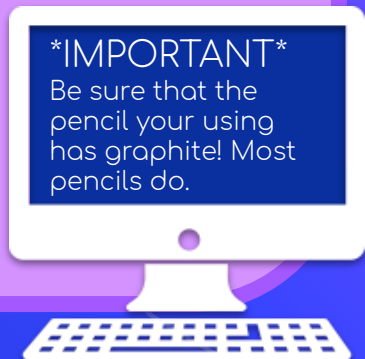
Pro Tip:

This project requires a LOT of graphite.

To get this graphite you can use mechanical pencil lead or a normal pencil. However, the normal pencil might be harder to get enough graphite. You can extract the graphite from the pencil through a variety of ways. **Make sure you parental help before you do so! Safety first!**

Learn to extract pencil lead here!

And here!



Graphite Circuits - STEP 3

Materials:
- 1 Graphite Pencil
- Mini LED Light Bulb
- 9V Battery
- Tape
- Paper

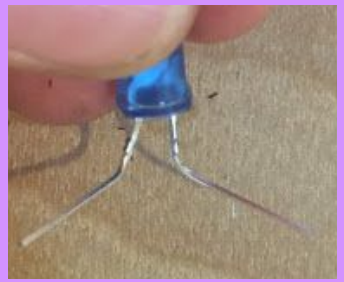
Make Your Circuit- Follow these three steps to complete your graphite circuit!

Bend the Legs of the LED	Tape Down the LED	Connect the Battery!	Troubleshooting!
Bend the LED legs in order to tape one leg to each of the openings on your circuit.	Tape down the LED in tone the gaps on your circuit. Make sure that the entire leg is connected to the graphite.	Connect the battery to other gap in your circuit. Make sure that it's positive to positive and negative to negative!	If it doesn't work, lets troubleshoot! ❏ Does the LED work outside of the circuit? ❏ Does the battery have power? ❏ Do your lines have enough graphite to conduct the electricity?

Graphite Circuits - STEP 3

Materials:
- 1 Graphite Pencil
- Mini LED Light Bulb
- 9V Battery
- Tape
- Paper

Make Your Circuit- These are the previous steps shown in pictures!

Bend the Legs of the LED	Tape Down the LED	Connect the Battery!
		

Graphite Circuits - STEP 4

Improve Your Circuit!

Experiment a little! How long can you make your circuit? How wide do the lines really *need* to be? What other modifications can you do to your circuit?

Want to learn more about actual circuits?!

- Different Type of Circuits
- Types of Circuits
- Circuits - short video