UNLOCKING ELECTRICITY

Shashwat Jaguri

from Coduriosity
www.coduriosity.com

Preface

Coduriosity was founded with the goal of bringing education to children who don't have the resources or support to pursue STEM. This book aims to not only helps bridge that gap by not only helping the children in those underprivileged schools but helping anyone who picks this book up to start their journey into robotics.

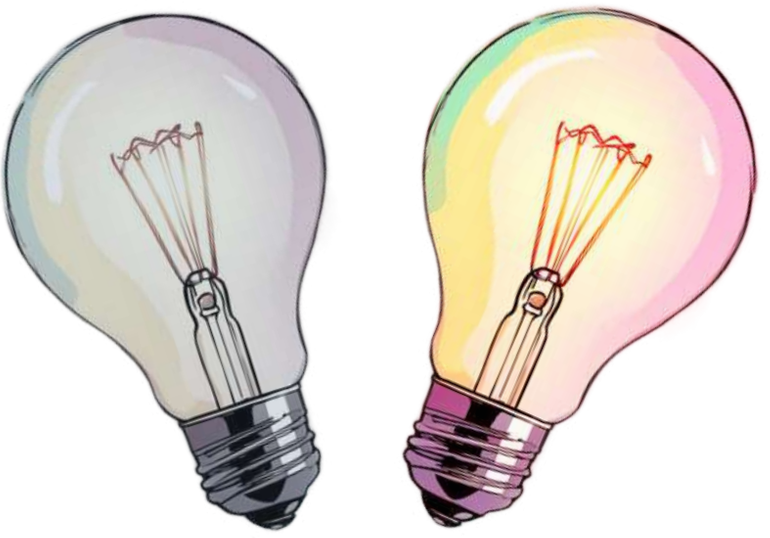
Through this book "Unlocking Electricity" I hope to demystify and make complex concepts more accessible to young learners - such as those that I taught my classrooms in different rural schools - with a fun and engaging introduction to this field.

I would like to express my deepest gratitude to my students, whose boundless curiosity and enthusiasm have fueled my passion for teaching. I am also indebted to my fellow teammates who have through the experiences with me, helping me refine the ideas presented in this book.

I invite you, young inventors, to dive into the pages of this book with an open mind and a heart full of curiosity.

- Shashwat Jaguri (Founder)

Electricity makes lightbulbs glow or fans spin



It is a source of energy that can be used to make things move or emilt light

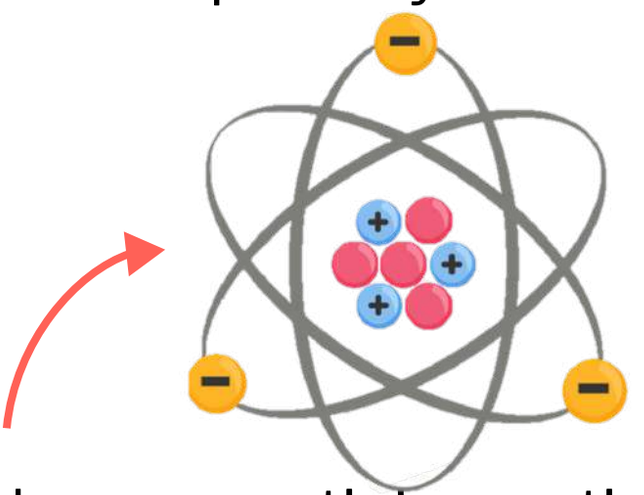
Using sensors that are able to detect changes in the environment, acting like eyes and ears and microcontrollers acting like the brain.

This is a microcontroller connected to a battery and a bulb

we can use electricity to do more complex things such as making phones and computers work

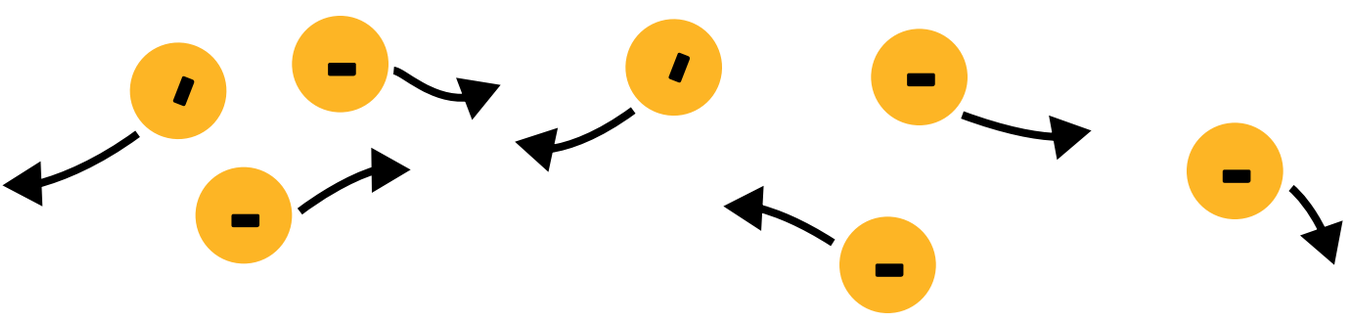
So what exactly is electricity?

Everything around you, from the tiniest ant to the tallest tree, is made up of tiny building blocks called atoms.



These atoms have even tinier particles called electrons buzzing around them.

In certain materials like metals, these electrons are free to move around.



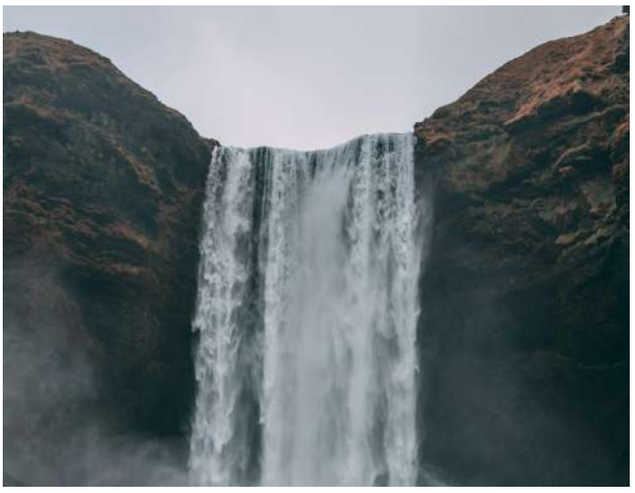
Just like how water flows in a river or pipe, these electrons flow in wires sharing energy through electricity.

This flow of electricity is called the current.

Just like a waterfall flows from the top of a cliff into the lake below, electricity needs a high point to flow from and a lower point to go too.

+ high

- low



Batteries have + and - symbols on them. The plus is like the edge of a cliff and the minus is like the lake below.

The higher the cliff is the stronger the force of the waterfall. Similarly the higher the voltage of the battery is the more force the battery has

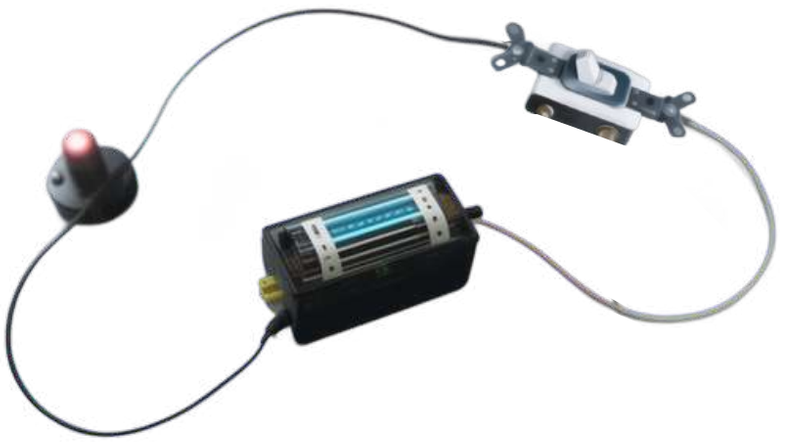
If you connect a battery with a high voltage to a bulb it will glow brighter.

Batteries provide this voltage/power till they have no more energy left and stop working.

How does electricity work?

Electricity needs the wires to have a complete path from the + of the battery to the -

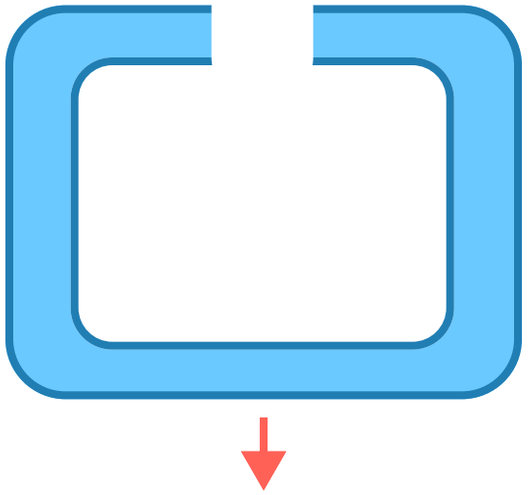
A switch like the one that turns the light on and off in your home breaks this path turning the light off



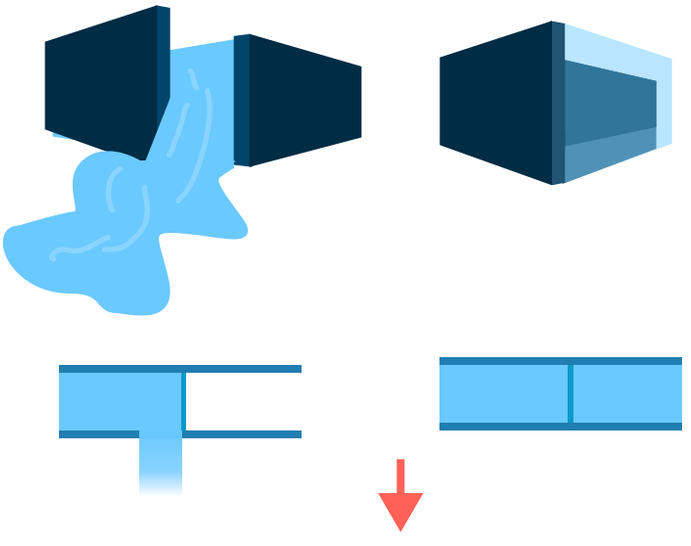
The most important thing is to make sure that the circuit is connected properly.

- if there is a break then electricity won't flow
- if there is a path with less components (resistance) then the electricity will go there

You can think of the electricity as water.



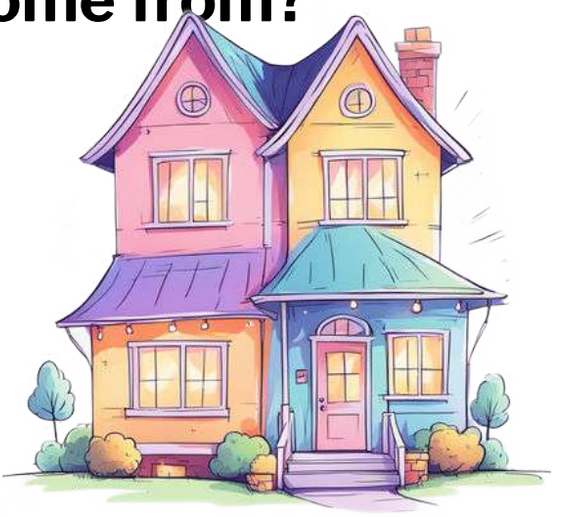
If there is a break in the pipe then the water wont go where you want it to

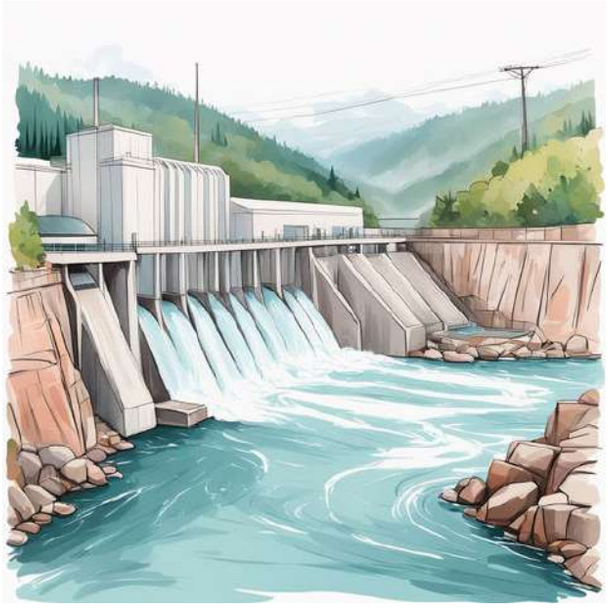


If there is somewhere for the water to leak too, it wont go where we want it to

Where does electricity come from?

Electricity in houses comes from power plants, which make it using different methods.





One kind is a hydroelectric plant. It uses the power of moving water to make electricity.

Imagine a waterfall - the water's energy makes a big wheel spin, and that spinning wheel makes electricity.

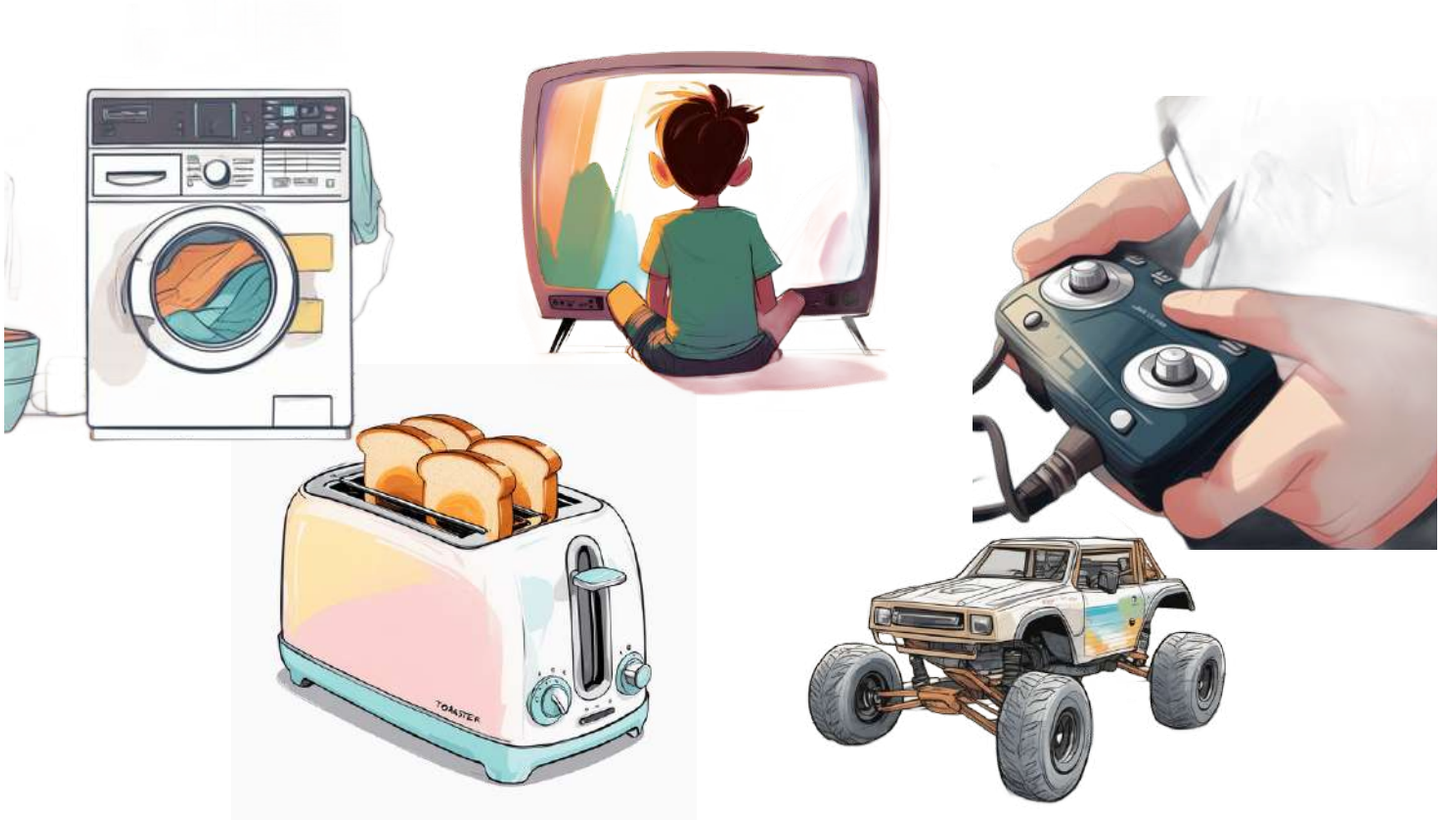
Another kind is solar electricity. It uses special cells that soak up sunlight and turn it into electricity.

So, when the sun shines, it helps make electricity for our homes.

What is electricity used for?

Electricity makes our lives easier by powering lots of different machines.

Think about things like toasters that make toast, refrigerators that keep our food cold, microwaves that heat up our food quickly, and washing machines that clean our clothes.



Electricity has changed the way we do everyday things, like cooking meals and keeping our homes cozy. It's a really important part of how we live nowadays.

Quiz

- Electricity makes _____ glow.
- Everything around you is made up of tiny building blocks called _____.
- Batteries provide voltage/power till they have no more energy left and _____ working.
- In certain materials like metals, electrons are:
  a. stuck in place
  b. free to move around
  c. nonexistent
- This flow of electricity is called the _____.
- What analogy is used to describe how electricity flows in wires?
  a. Birds flying in the sky
  b. Water flowing in a river
  c. Cars driving on a road
- Using sensors and microcontrollers, we can use electricity to do more complex things such as making _____ work.

- Batteries have + and - symbols on them. The plus is like the edge of a cliff and the minus is like the _____ below.

- What breaks the path of electricity flow in a circuit?
  a. Switch
  b. Battery
  c. Light bulb
  d. Wire

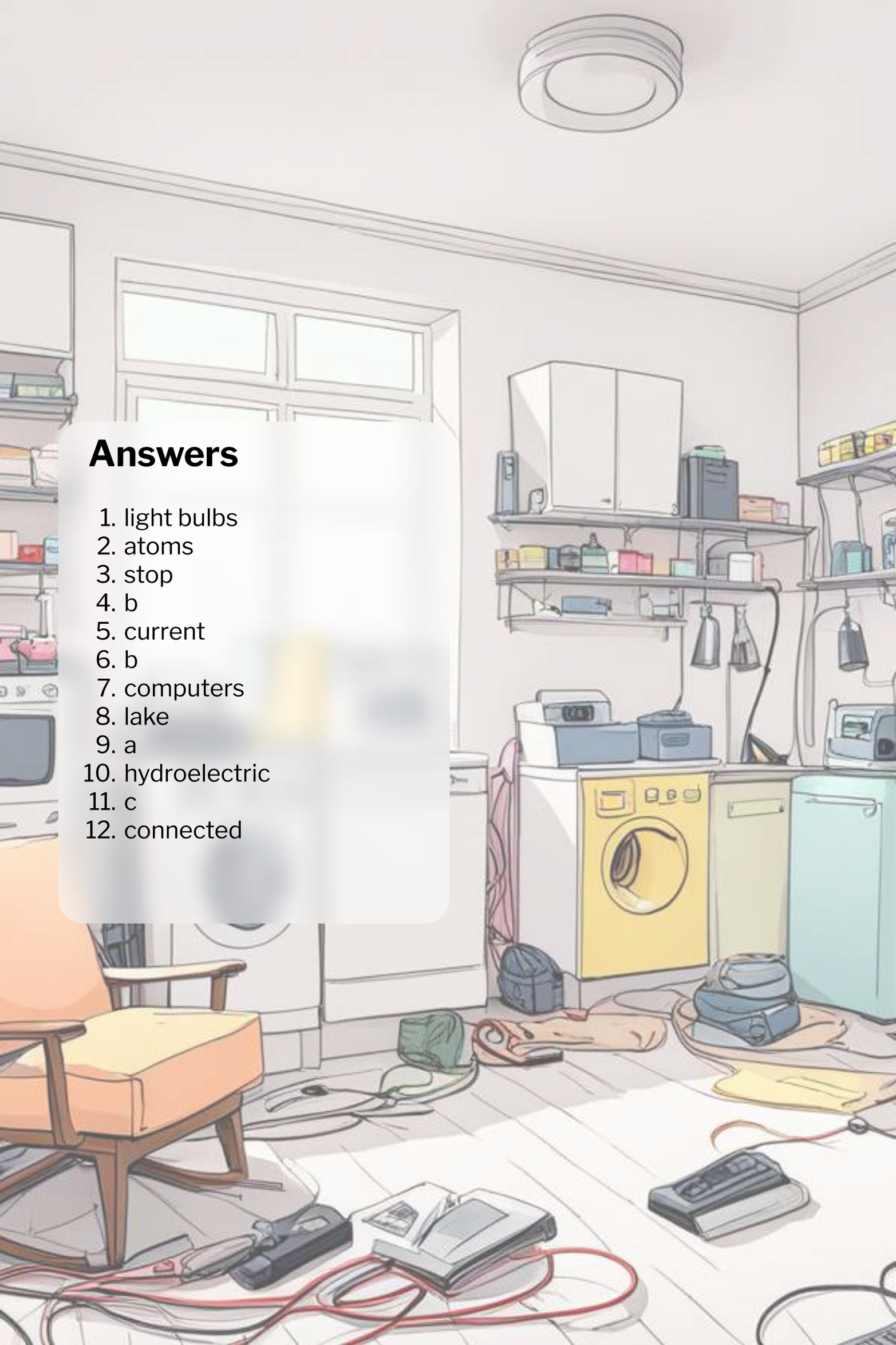
- One kind of power plant is a _____ plant. It uses the power of moving water to make electricity.

- What is an example of something powered by electricity?
  a. Rock
  b. Tree
  c. Toaster
  d. Lake

- Every component needs to be _____ for electricity to flow

THE END!!

well the answers are on the next page, but after that its the end



Answers

1. light bulbs
2. atoms
3. stop
4. b
5. current
6. b
7. computers
8. lake
9. a
10. hydroelectric
11. c
12. connected

About our Team

Shashwat Jaguri

Hi, I'm the founder of the organization Coduriosity. My journey started with my own fascination with tech. Inspired by what I was able to create and my own drive too keep on learning, I've been working to bring opportunities to pursue stem to rural locations by running workshops and trying to bring the resources, getting funding for the electronics needed to support such programs and providing students and teachers with the knowledge needed to continue exploring on their own too!

Sebastian Inestroza

Hi! I am a passionate and dedicated member of Coduriosity, committed to making a positive impact in the engineering field. With a deep-rooted belief in the power of collective action, I contribute tirelessly to the organization's mission, striving for a better future for all. Driven by an unwavering passion for sophisticated and impactful education, I actively engage as the resource director for the organization to help enrich the minds of those we reach.

Salil Joshi

My commitment to Coduriosity cause is fueled by my belief that everyone has a role to play in creating positive change! I believe that through collaboration, education and awareness, we can address the issues facing our world and foster a more compassionate society. As the head of social media, I craft engaging content, dedicated to spreading awareness and driving positive change. I hope to spread awareness and amplify our mission for a more compassionate and just society

UNLOCKING ELECTRICITY

"Unlocking Electricity" invites young minds on an electrifying adventure into the captivating world of electricity! From the glow of light bulbs to the spin of fans, this engaging book demystifies the wonders of electricity in a fun and accessible way.

Discover **how circuits work**, and explore the amazing ways electricity powers our everyday lives. With **colorful illustrations** and **clear explanations**, "Electricity Unlocked" sparks curiosity and ignites a passion for learning about the science that lights up our world.

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