

THE POWER OF ELECTRICITY

Purpose Of The Activity:

It explains how city electricity is delivered and expresses the functions of electrical circuit components. It produces a simple flashlight by assembling an electrical circuit.

Theme Beyond Disciplinaries:

Sharing the planet.



TUNING IN

Let's arouse curiosity!



FINDING OUT

What Should Little Science People Discover?



TAKING ACTION

Question Of The Day?



QUESTIONING CYCLE

MAKING CONCLUSIONS

Activity Pages, Exit Card



GOING FURTHER

What else can we do? ?



Let's Start Discovering!, Scientific Explanation For The Curious, Video



THE POWER OF ELECTRICITY

Let's Arouse Curiosity



Students are directed the following questions:

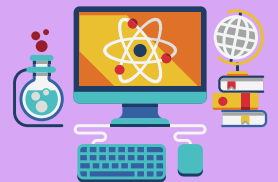
- Can we live without electricity?
- Where do we use electricity?
- Is there an alternative energy source to electricity?
- Why should we save electricity?

"In today's cities, dense technological infrastructure ensures that electricity reaches every home and workplace quickly and effectively. Understanding how this energy source arrives helps us better understand the electrical devices we use in our daily lives. It is necessary to understand the importance of electricity in our daily lives and put this knowledge into practice. This way, we can navigate our technology-driven world more consciously. Are you ready to embark on the captivating journey of electricity?" It is asked in this way. The materials of the activity are taken out and examined.

Let's Start Discovering!

Activity video is watched by pausing. The content of the set is checked before proceeding with the activity. All the lid and package opening stages are done simultaneously with the students.

Watch The Video By Pausing!



Set Content

- | | |
|--|---|
| <input type="checkbox"/> Wooden flashlight template..... | <input type="checkbox"/> Hook and loop fastener..... |
| <input type="checkbox"/> LED bulb..... | <input type="checkbox"/> Scissors (not included in the set..... |
| <input type="checkbox"/> Coin cell battery..... | <input type="checkbox"/> content)..... |
| <input type="checkbox"/> Conductive fabric tape..... | <input type="checkbox"/> "Journey of Electricity" activity sheet..... |
| | <input type="checkbox"/> Scientist card of Nikola Tesla..... |

How Do We Do It?

1. The long leg of the LED bulb is placed on the positive (+) side of the coin cell battery, and the short leg is placed on the negative (-) side, and it is checked whether the bulb lights up.
2. The electrical circuit is built on the wooden flashlight template as follows:
3. The long leg of the LED bulb is placed on the part labeled (+), and the short leg is placed on the part labeled (-).
4. The conductive fabric tape is folded double-sided and stuck to the part labeled (+).
5. The serrated surface of the coin cell battery is stuck to the tape.
6. The conductive fabric tape is cut according to the length of the lines, and five pieces of tape are stuck except for the bottom right line. (***)Make sure that all tapes touch each other at the corners and are on the path)
7. The tape on the bottom right line is stuck to the coin cell battery.
8. The hook and loop fasteners are stuck to the corners of the wooden flashlight templates so that they match each other.
9. The wooden flashlight template with the "Discovery Box" text facing forward is placed on top of the other.
10. The "Discovery Box" text is pressed, and it is observed whether the LED bulb lights up when the "K" letter is pressed.

What Should Future Science People Discover?

Students are directed the following questions:

- What is the role of electricity in our daily lives? In which areas is it used?
- How did people meet their energy needs? What advantages did the discovery of electricity bring?

Electricity is an energy source that has become indispensable in our daily lives as technology advances. It is used in lighting, heating, various device operations, as well as transportation in our daily lives. In the past, people met many of their needs by lighting fires. However, lighting a fire was very laborious and was not sufficient to meet constantly increasing needs. After the discovery of electricity, people produced many tools and equipment that operate with electricity. These tools have greatly facilitated life.

Electricity is required for illumination, communication, transportation, and various electronic devices. Some of the electrical appliances used in homes include refrigerators, washing machines, mixers, and vacuum cleaners. Electric cars, electric bicycles, and electric motorcycles are used for transportation. But how is electricity produced for these vehicles? Where does it come from?

Electricity is generated at power plants and delivered to cities through cables. Electricity is not infinite, so it needs to be used efficiently. Batteries and accumulators are devices used to store electrical energy. Different types of batteries and accumulators are used to store electricity. For example, batteries are used for flashlights, portable devices, smartphones, tablets, laptops, and other electronic devices. There are also batteries used for storing energy from renewable energy sources such as solar panels, wind turbines, and other renewable energy sources, used in homes and workplaces. There are several safety precautions to consider when using batteries and accumulators. The correct type of battery suitable for the electronic device's requirements should be used. Using the wrong type of battery can damage the device and even cause it to explode.

To produce a flashlight by creating a simple electrical circuit, you need a battery or accumulator, a switch, a bulb or LED, and appropriate cables. To assemble the circuit, cables are connected between the positive (+) and negative (-) terminals of the battery or accumulator. These cables are connected to the switch and the bulb or LED. The switch is used to control the circuit; when it is in the open position, the circuit is closed, and when it is in the closed position, the circuit is open, allowing the bulb or LED to emit light.



Scientific Explanation For The Curious

Students are directed the following questions:

- What are the steps to build a simple LED circuit? Which elements are used and how are they connected?
- What could be some problems if the LED does not light up, and what can be done to troubleshoot these problems?

Some basic circuit elements that can be used for simple electrical circuits include:

Battery: A battery is a basic circuit element used in many electronic devices. It consists of a two-pole battery and acts as a current source.

Switch: A switch is a button that opens and closes a circuit. It is generally used to power on or off a circuit.

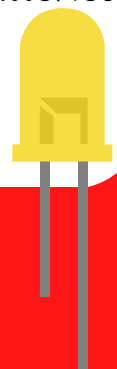
Bulb: A bulb is a light source used to indicate whether a circuit is open or closed. It can be powered by a battery or another power source.

Cable: A cable is a conductor that carries current in a circuit. It is usually made of metal such as copper or aluminum.

Safety is prioritized when working with electricity. While the voltage of the battery is generally low and safe in such simple circuits, caution should still be exercised.

LEDs have two legs: one is shorter and the other is longer. The longer leg of the LED is positive (+), and the shorter leg is negative (-). To connect the LED correctly, the positive (+) side of the battery is connected to the longer leg of the LED, and the negative (-) side of the battery is connected to the shorter leg of the LED. Cables or conductive tapes can be used to make the connection between the battery and the LED bulb. Make sure there are no gaps between the cables or tapes.

After making all the connections, the circuit is checked. Is the LED lighting up? If it's not, check if the positive and negative legs of the LED are connected correctly. Troubleshooting can be done using different batteries and LEDs.



What Else Can We Do?

Dear Teacher,

You have produced an electric vehicle and a flashlight with the future scientists. You can do an activity where you will gain basic knowledge about energy conversion by making a simple device that works with electricity.

Mysterious Adventure

Materials: Produced flashlight

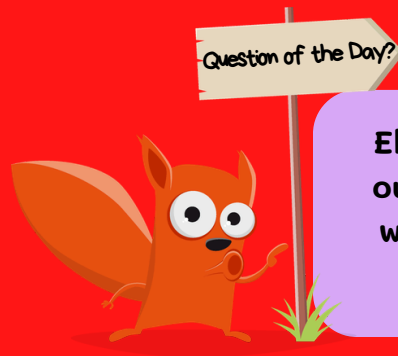
- First, the classroom needs to be prepared by taking necessary safety precautions. It is important to remove dangerous or falling risk objects and provide a tidy environment.
- The classroom lighting is turned off, and it is ensured that the incoming light to the classroom is minimal. This will allow students to explore in the dark.
- Some areas of the classroom are attached with clues to a riddle.

Example Riddle: "Once upon a time, there was something and there was nothing, full inside like a stone, it shines in the deep darkness, like its eyes"
Answer: Stars

- Clues and guidance can be provided for the riddle.
- The teacher introduces the activity to the students, where they will explore in a dark classroom, and explains the purpose. It is emphasized that the aim is entertainment, exploration, and teamwork.
- Instructions are given to the students on how to behave in the classroom. It is important for them to be calm, respectful to each other, and careful.
- Students are informed that there is a mystery hidden in the classroom, associated with clues hidden in different corners of the classroom.
- Students are told to carefully explore the classroom and gather each clue together to solve the mystery.
- Students start to explore the classroom with their flashlights.
- Students provide guidance on clues and provide necessary support.
- Students work together to gather clues. They exchange ideas to solve the riddle and act together.
- Students gather all the clues and solve the mystery. Students who find the correct answer can be rewarded, and their achievements can be celebrated.

What Did We Discover? / Exit Card

"Today, we discovered how electricity plays an indispensable role in lighting, heating, communication, transportation, and the operation of various electronic devices. We discovered what electrical circuit elements are and how they are connected. Together, we produced our own flashlight." The "Journey of Electricity" activity sheet is given. The scientist card of Nikola Tesla is read. An exit card is given.



Electricity is used in all aspects of our lives, but if electricity sources were to run out in the future, how would humanity build an energy future?

Communicator

Balanced

Principled

Sensitive

Knowledgeable

Open Sighted

Investigator Questioning

Thinking

Which learner profile did the Scientist (Nikola Tesla) exhibit?

Risk Taker

Why?

CURIOUS BOX



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