CHIP KIDS

Light it Up Description:

Explore the concept of energy transfer using everyday items you can find around your home. Students will conduct an experiment using a lightbulb, foil, battery, and wire to create an illuminated lightbulb. This hands-on activity will help students visualize how energy moves through a circuit, enhancing their understanding of electrical conductivity and the importance of creating a closed loop for effective energy transfer. This experiment emphasizes critical thinking and problem-solving skills as students work to ensure their circuits function correctly.

Lesson Plan. Light it Up! Understanding how Circuits Work
Grade Level: 6^{th}-8^{th}
Subject: Science and Technology

Standard(s) that may apply:

- Make observations to provide evidence that evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.
- Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or to test a design solution.

Materials:

- Aluminum foil
- AA Batteries (1)
- D Batteries (2)
- Tape
- 1.5 v Lightbulb (flashlight bulb)
- Copper Wire
- Scissors
- Light It Up! Lab Report
- TWLH handout

Essential Question:

1. How does energy move from one place to another?

Supporting Questions:

1. Students will understand the concept of energy transfer.
2. Students will learn how energy moves from one place to another.
3. Students will conduct an experiment to visualize energy transfer using a battery, aluminum foil, and a lightbulb.

Before Viewing the Video:

1. Introduction
    a. Ask students what they think energy is and how it can move from one place to another.

    b. Explain to students that energy can be transferred in several ways, such as through heat, light, or electricity.

2. Explanation of Energy Transfer
    a. Energy in Everyday Life: Discuss common examples of energy transfer, like toaster heating bread or a car engine running.

    b. Focus on Electrical Energy: Explain how electricity can transfer energy through circuits, making devices work.

Light It Up Experiment.

Materials needed: *Light it Up* Lab Report, TWLH handout, a battery, small lightbulb, piece of aluminum foil, tape, and scissors.

Set-up Instructions:

1. Distribute materials: *Light It Up* Lab Report, TWLH handout, a battery, a small lightbulb, a piece of aluminum foil, tape, and scissors.

2. Have students complete the "T" and "W" portion of the TWLH handout.

    b. Have students write their hypothesis in their Lab Report.

    c. Demonstrate how to connect the battery to the lightbulb using the aluminum foil as a conductor.

    d. Instruct students to use the foil to create a circuit, ensuring that the foil touches both the battery terminals and the lightbulb contacts.

    e. Explain that the battery has a positive side (cathode) and negative side (anode). Electrolytes in the battery allow the flow of electrical charge between the anode and cathode.

Conduct Experiment:

1. Have students work in groups to complete the Light It Up! experiment.

2. Encourage them to observe and complete their Lab Reports.

While Viewing the Video:

Video: *Light It Up!*

- Allow students to complete lab questions.

1. What happens when the wire or foil is connected to the battery?

2. What happens when the lightbulb is added to the circuit?

3. What would happen if two batteries were stacked on top of each other?

After Viewing the Video:

Class Discussion:

1. Ask students to share their observations. Did their lightbulb light up? Why or why not?
2. Discuss why aluminum foil works as a conductor and the importance of creating a closed circuit.
3. Talk about how energy is transferred from battery to the lightbulb to produce light.

Conclusion:

1. Recap how energy can be transferred from the battery to the lightbulb, making it light up.

Discussion Questions for Students:

1. What are some other examples of energy being transferred in your daily life?
2. Why is it important for the circuit to be closed for the lightbulb to work?

3. Can you think of any other material other than aluminum foil that might

work to conduct electricity? Why or why not?

4. How does understanding energy transfer help us understand technology more effectively?