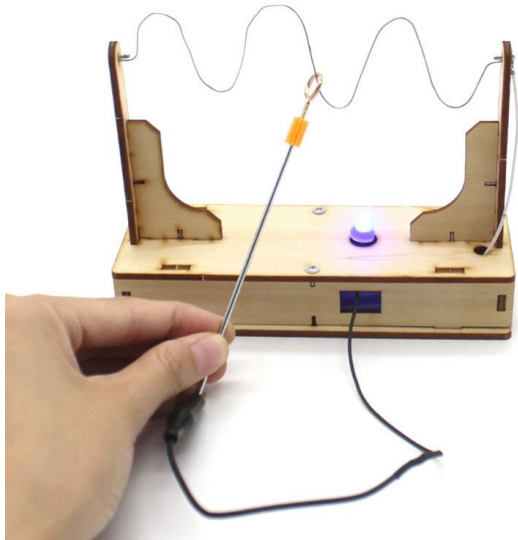


CROSS-FIRE DEMO KIT

CAT# 80-50-W140



The Electric Conductivity Kit is an exciting STEM project that explores electrical conductivity, circuits, and the relationship between electricity, sound, and light. This kit is similar to the old game "Operation," where the goal is to avoid contact between the metal horn nail on the shaft and the conductive iron wire. When contact occurs, the circuit is completed, causing the LED light to illuminate and the buzzer to sound, demonstrating the principles of closed and open circuits.

PRIMARY DIVISION: GRADES 1-3

Overall Expectation: STEM, Structure and Mechanisms Focus

Explore structures and mechanisms, including the roles of materials in supporting structures and making devices work.

Specific Expectation:

Identify and describe the purpose of simple machines such as levers and pulleys.

Activity:

Students use the Electric Conductivity Kit to understand how a circuit works. They explore how touching the conductive iron wire with the horn nail completes the circuit, causing the buzzer to sound and the light to turn on. This helps them learn about the basics of electrical circuits in a fun and engaging way.

JUNIOR DIVISION: GRADES 4-6

Overall Expectation: STEM, Matter and Energy Focus

Investigate the principles of forces, energy, and control in simple machines and structures.

Specific Expectation

Explore the relationships between the components of simple machines and the forces acting on them.

Activity

With the Electric Conductivity Kit, students investigate how electricity flows through a circuit and what happens when a circuit is open or closed. They experiment with different materials to see which ones are conductive and which ones are not, helping them understand the concept of electrical conductivity.

INTERMEDIATE DIVISION: GRADES 7-8

Overall Expectation: TEM, Structure and Mechanisms Focus

Investigate how technological problem-solving meets human needs and leads to innovation.

Specific Expectation

Analyze the impact of friction and lubrication on the efficiency of mechanisms.

Activity

Students use the Electric Conductivity Kit to explore more complex circuits and the impact of different materials on conductivity. They experiment with different types of wires and connectors to see how these affect the efficiency of the circuit, learning about resistance and the importance of material selection in electrical engineering.

SECONDARY DIVISION: GRADES 9-12

Overall Expectation: Physics Focus

Apply principles of physics to understand the operation and efficiency of mechanical systems.

Specific Expectation

Analyze mechanical advantage and efficiency in simple and compound machines.

Activity

Using the Electric Conductivity Kit, students delve into the principles of electrical circuits, including series and parallel circuits. They calculate the resistance in different parts of the circuit and discuss how efficiently electricity is converted into light and sound. This provides a deeper understanding of electrical principles and their applications in real-world technology.

CROSS-CURRICULAR CONNECTIONS

Mathematics

Students can calculate resistance and current using Ohm's Law based on the materials used in the circuit.

Technology:

They explore different designs and materials for optimizing the conductivity and performance of the circuit.

Language Arts

Students can write reports or presentations on the principles of electrical conductivity and circuits, discussing their applications in various engineering and technological fields.

Summary

By experimenting with the Electric Conductivity Kit, students engage in hands-on learning experiences that deepen their understanding of electrical principles and circuits while meeting curriculum expectations. This project promotes critical thinking and curiosity in STEM disciplines, encouraging students to explore the potential of electrical technology and the importance of innovative problem-solving in engineering.