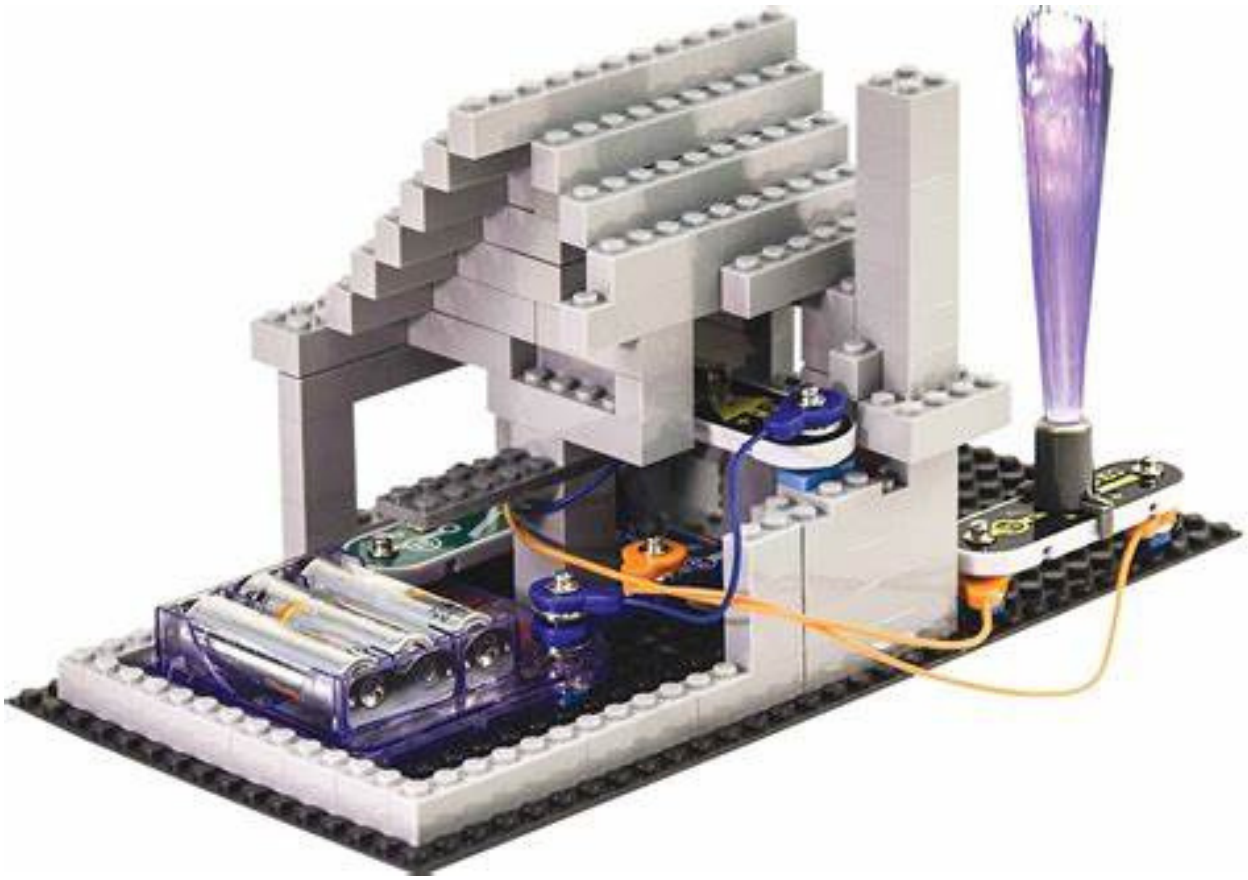
Snap Circuits
Bric Essentials



Mid-Valley
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Snap Circuits

The Snap Circuits Kit offers an engaging, hands-on approach to STEM learning, allowing students to explore the basics of electronic circuits, energy, electrical engineering, and system design. With easy-to-use snap-together components, learners will build functional models of electrical systems, fostering skills in circuitry, engineering, and problem-solving. This kit encourages creativity, critical thinking, and exploration through hands-on activities.

Grade Level

K - 8th grades

Group Size

1 - 3 students per set

Time Duration

30 - 60 minutes

Content of Kits

Components

- 10x kits containing
  - Various conductive connectors, switches, light, and sound features.
  - Assorted LEGO bricks
  - Battery pack

Consumables

- AA batteries

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Usage

Getting Started

1. Unpack and Organize Components – Lay out all circuit pieces, ensuring resistors, switches, LEDs, and power sources are present and accounted for.

2. Review the Instruction Guide – Familiarize students with circuit symbols, component functions, and safety guidelines.

3. Introduce Basic Circuit Concepts – Explain series and parallel circuits, electrical flow, and how different components interact.

4. Start with a Simple Circuit – Have students build a basic LED or buzzer circuit to understand how connections impact functionality.

5. Encourage Experimentation – Allow students to modify their circuits by adding switches, extra lights, or sound modules to observe changes.

6. Discuss Real-World Applications – Relate circuit concepts to everyday electronics like light switches, doorbells, and battery-operated devices.

Storage

Organize and store all components in the original packaging to ensure easy access and prevent loss. Make sure to remove AA batteries from the battery box when storing the kit.

Troubleshooting

- Ensure all connections are secure
- Test the circuit by powering it on and observing the outcome.
- If the circuit does not work as expected, encourage students to troubleshoot by checking connections and component placements.
- Refer to the online guide for troubleshooting specific circuits.

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Activity Guide

Beginner

Lighting Up a Circuit
Start with simple circuit-building projects using the provided manual. Their first task is to create a basic circuit to light an LED, introducing them to electricity, current flow, and circuit connections. Once they grasp the fundamentals, they can progress to building a motorized fan or a sound-activated switch. These hands-on projects reinforce energy transfer and circuit functionality, preparing students for more complex electrical concepts.

Intermediate

Troubleshooting and Custom Circuits
Students will expand their circuit knowledge by assembling and troubleshooting more complex designs. They will learn to identify and fix connection issues while experimenting with different configurations. This hands-on approach strengthens problem-solving skills and creativity. By modifying and optimizing their circuits, students build confidence in designing functional systems, bridging classroom learning to real-world applications.

Advanced

Innovative Circuit Design
Students will design and build original circuits, exploring power distribution, efficiency, and functionality. This challenge fosters problem-solving and critical thinking as they refine their designs. By connecting their work to real-world applications like renewable energy and robotics, they gain insight into electrical engineering's role in modern technology.

Extension Activities:

Designing a Smart Home System
Expanding on their circuit knowledge, students will collaborate to create a model smart home system using Snap Circuits. Teams will design interconnected circuits that simulate real-world automation, such as motion-activated lights, door alarms, or fan control based on temperature. They will collaborate to integrate multiple circuits, troubleshoot issues, and refine their designs for efficiency. This activity encourages teamwork, innovation, and critical thinking while demonstrating how electrical engineering is applied in modern technology and home automation.

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Learning Extensions

STEAM Connections: Engineering - Physics - Design

Learning Objectives:

- Introduction to concepts including magnetism, electrical systems, circuit design, understanding electrical equations, measuring voltage and resistance.
- Enhance understanding of fundamental concepts in energy and electrical engineering.
- Develop problem-solving and critical-thinking skills.
- Encourage teamwork and collaboration in project-based learning.

Career Connections:

- Electrical Engineering
- Computer Engineering
- Renewable Energy Technology
- Robotics & Automation
- Aerospace & Automotive Engineering

Essential Employability Skills:

- Critical thinking
- Problem-solving
- Creativity
- Teamwork
- Communication

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Resources and Accessibility

Safety Guidelines

- **Use Batteries Only –** Never connect Snap Circuits to wall outlets.
- **Check Connections Carefully –** Ensure all components are properly snapped in place to prevent short circuits or overheating.
- **Avoid Metal Objects –** Keep metal tools and conductive materials away from the circuit board.
- **Supervise Younger Students –** Ensure younger learners follow instructions carefully and do not force or misuse components.

Accessibility

- **Provide Visual and Audio Instructions –** Offer step-by-step guides in multiple formats.
- **Use Adaptive Tools –** Provide modified switches or larger connectors for students with fine motor challenges to make circuit assembly easier.
- **Allow Alternative Participation –** Assign roles like diagramming circuits, troubleshooting, or verbalizing design ideas for students who may struggle with hands-on tasks.
- **Ensure Clear Workspaces –** Organize materials in labeled trays and maintain a clutter-free workspace to assist students with cognitive or visual impairments.
- **Offer Extended Time –** Allow students who need extra processing or motor coordination time to complete their projects at a comfortable pace.

Library Catalog

Library Resources

Feedback

QR to feedback survey