

Conduction

30 minutes

Electricity and Simple Circuits

WHAT THIS LESSON DOES

As the teacher, guide your students through building a circuit using Snap Circuits to explore electrical conduction. Help them assemble components, test various materials as conductors or insulators, and discuss their findings to reinforce key concepts.

WHAT STUDENTS SHOULD BE ABLE TO DO

- Understand the concept of electrical conduction and identify materials that can conduct electricity.
- Build a basic circuit using a base grid, batteries, a battery holder, an LED light block, a resistor block, and wire blocks.
- Recognise the importance of correct placement and connection of circuit components for successful electrical flow.
- Conduct experiments to test the conductivity of various objects and materials.
- Reflect on the results of the experiments, reinforcing the understanding of conductors and insulators.

BEFORE THE LESSON

- Have one Snap Circuits set per group, each with its own batteries. Check every set has working batteries in the battery holder before the bell.
- Confirm each set contains the parts named in the build: base grid, battery holder (B1), red LED block (D1), 100 Ω resistor (R1), two 2-wire blocks used twice and two 1-wire blocks.
- Gather a tray of test objects per group: metal spoon, key, paper clip, pencil, paper, plastic toy. Aim for a clear mix of metal and non-metal.
- Give each group a clear, flat, stable surface with room to spread out.

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HOW THE LESSON RUNS

Introduction

Prepare the Base Grid

Inserting Batteries

Place the battery holder (B1)

Place the red LED light block (D1)

Place the 100 Ω resistor block (R1)

Place two 2 wire blocks

Place two 1 wire blocks

Place two 2 wire blocks

Experiment with Objects and Materials

Wrap Up and Review

TEACHING MOVES

- 1. Introduction. Tell pupils today they build a light circuit and then test objects to see which let electricity through. Do not define conductor and insulator yet, let the experiment reveal it.
- 2. Prepare the Base Grid. Have each group set the base grid flat before touching any blocks. Check spacing so groups are not reaching across each other.
- 3. Inserting Batteries. Walk the room and confirm every holder has batteries seated the right way. A dead or reversed battery is the most common reason a finished circuit does not light.
- 4. Place the battery holder (B1). Point to C4 on the grid and have pupils snap the holder down firmly. A loose snap breaks the circuit silently, so listen for the click.
- 5. Place the red LED light block (D1). Stress polarity: plus side to F2, other side to F4. Have pupils double-check the plus and minus markings before pressing down, because a reversed LED simply will not light.
- 6. Place the 100 Ω resistor block (R1). Place across E2 to C2. Use your roadblock image: the resistor slows the electricity to protect the parts. Direction does not matter, only that both ends snap in.
- 7. Place two 2 wire blocks. F2 to E2 links LED to resistor, F4 to E4 links LED to holder. Frame wires as roads for electricity and check both ends are fully snapped.
- 8. Place two 1 wire blocks. Place one 1-wire block at B2 and one at B4. These two open ends become the test points pupils will bridge with objects.
- 9. Place two 2 wire blocks. B2 to C2 and B4 to C4 close most of the loop. Point out the circuit is deliberately left open at the two test points, that gap is where the experiment happens.
- 10. Experiment with Objects and Materials. Show pupils how to touch one object across both open leads and watch the LED. Predict before testing each object, then check. Sort into two piles as you go.
- 11. Wrap Up and Review. Draw out that everything that lit was metal. Only after they have shared findings, name the two groups: conductors let electricity through, insulators do not.

WHAT TO WATCH FOR

- Students may think: Pupils assume a correctly built circuit that will not light must be broken, when the LED is simply inserted backwards. What to do: Have them lift the LED block and re-seat it with the plus side to F2. Emphasise that an LED only works one way round.
- Students may think: Pupils think an object failed the test because it is small or thin, rather than because it does not conduct. What to do: Test a large plastic object and a small metal paper clip side by side. Let them see size does not matter, material does.
- Students may think: Pupils blame the object when the real fault is a block that is not fully snapped down. What to do: Before testing, have them press every block and confirm the light works when they bridge the gap with a known metal object.

DIFFERENTIATION

- Emerging: Pre-place the battery holder and LED on the grid so the pupil starts from a partly built circuit and adds only the wire blocks. Pair them with a partner who reads the grid references aloud while they place each block.