

LED Circuit

30 minutes

Electricity and Simple Circuits

WHAT THIS LESSON DOES

As the teacher, guide your students through building a basic LED circuit using Snap Circuits. Explain the importance of electricity flow direction, assist with assembling components like the battery holder and LED, and encourage experimentation to reinforce learning.

WHAT STUDENTS SHOULD BE ABLE TO DO

- Understand the basic principles of an LED circuit, including the direction of electricity flow.
- Develop practical skills in assembling a basic LED circuit using Snap Circuits.
- Recognise the importance of correct placement of circuit components, particularly the LED light block.
- Apply knowledge of circuitry to experiment with and troubleshoot LED circuits.
- Develop a curiosity for further exploration and understanding of electrical circuits.

BEFORE THE LESSON

- Check every Snap Circuits set has working batteries in its holder before the lesson starts. A flat set stops a group dead and is hard to diagnose mid-build.
- Lay out one set per group with a clear, flat working space each. Count the pieces they will need: base grid, battery holder (B1), number 3 wire, red LED (D1), press switch (S2).
- Build the circuit yourself once beforehand so you know the grid positions and can spot a wrongly placed block at a glance.

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HOW THE LESSON RUNS

Introduction

Prepare the Base Grid

Inserting Batteries

Place the battery holder (B1)

Place wire block (3)

Place the red LED light block (D1)

Place the press switch block (S2)

Lighting Up the Circuit

Experiment with LED Direction

Exploration and Conclusion

TEACHING MOVES

- 1. Introduction. Hold up the red LED block (D1) so all groups can see it. Stress the one big idea: this light only works if electricity flows the correct way through it.
- 2. Prepare the Base Grid. Have each group set the base grid flat and squared in front of them before any pieces come out, so it does not shift as they snap blocks on.
- 3. Inserting Batteries. Do a quick round of the room confirming every holder has batteries seated properly. This is the most common reason a finished circuit stays dark.
- 4. Place the battery holder (B1). Call the grid reference aloud: battery holder at C4. Have pupils press until it clicks, and check the snap yourself for any group that is unsure.
- 5. Place wire block (3). Name both ends clearly: number 3 wire from C2 to E2. A wire not snapped fully at one end is a silent break, so ask them to tug it gently to test.
- 6. Place the red LED light block (D1). Slow right down here. Point out the plus and minus markings and insist the plus side of the LED meets the plus of the battery holder, C2 to C4. This placement decides whether it lights.
- 7. Place the press switch block (S2). Press switch from E2 to E4. Remind them the button will be their on and off control, so all blocks must be firmly snapped before they test.
- 8. Lighting Up the Circuit. Get everyone to press the switch together. Use the roundabout gate image: closed switch stops the flow, open switch lets it go round. Celebrate every light that comes on.
- 9. Experiment with LED Direction. Lead the flip as a shared experiment. Have them lift the LED, turn it around, press again, and see it stay dark. Ask them to say why in their own words.
- 10. Exploration and Conclusion. Circulate while groups build freely. Ask what they are making and how they think it works, and keep steering the talk back to the direction of the flow.

WHAT TO WATCH FOR

- Students may think: Pupils think a component that is placed on the grid is automatically connected, when in fact it is not fully snapped at one end. What to do: Teach a habit of gently tugging each block after placing it. If it lifts, it was not snapped, and that is usually why the light will not come on.
- Students may think: Pupils assume the LED will light whichever way round it sits, since it is the same block either way. What to do: Use the reversal experiment in step 9 as the fix. Seeing the identical block fail to light when flipped makes the direction rule concrete.
- Students may think: When the light stays off, pupils conclude the LED is broken rather than checking the whole loop. What to do: Walk them back through the circuit in order: batteries seated, each block snapped, LED plus to battery plus. The fault is almost always one of these.

DIFFERENTIATION

- Emerging: Pair them with a confident builder and give them one block to place at a time, checking each snap before moving on. Point to the exact grid reference on their own set rather than calling it out to the room.
- Developing: Ask them to name each block as they place it and say what it does, so the vocabulary sticks alongside the doing. Let them run the reversal experiment independently and predict the result before pressing the switch.
- Proficient: Challenge them to rebuild the working circuit from scratch without step prompts. Ask them to explain to a neighbouring group why the LED will not light when reversed, in their own words.