Name & Surname: _____ Class: _____ Date: _____

Circuits That Work

Build a loop that lights and buzzes!

About 60 minutes Level ★★★☆☆

What a Circuit Needs

A **circuit** is a complete **loop** that electricity can flow around. In a series circuit everything is joined in one single path.

- A **cell** gives the power. Two or more cells make a battery.
- A **wire** joins the parts and lets electricity travel.
- A **bulb** lights when electricity flows through it.
- A **buzzer** makes a sound when electricity flows through it.
- A **switch** opens the loop to stop, and closes it to go.



Task A

Talk with your partner. Pull ideas to each side, then decide. What if the bulb is left on all break time?

Your team built a bulb circuit with no switch. Should you add one?

Add a switch	Leave it without a switch
.....	.....
.....	.....
.....	.....

What if...?

.....

.....

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Build It Yourself

Make a simple series circuit and test it.

Key words

cell: small power unit that pushes electricity round

bulb: part that gives light

buzzer: part that makes a sound when electricity flows

wire: metal path that joins parts together

switch: part that opens and closes a loop

circuit: complete loop that electricity flows around

Task B

/2

Work in a small group to build and test a series circuit.

Aim To make a bulb light with a complete loop.

You will need

- [ ] 2 cells with holders
- [ ] 4 connecting wires
- [ ] small bulb with holder
- [ ] switch
- [ ] buzzer

⚠ Stay safe

- Use only low-voltage cells, never mains sockets
- Stop and tell the teacher if wires feel hot
- Do not touch broken bulbs, tell the teacher

Method

1. Connect a cell, a switch left open, and a bulb with wires in one loop.
2. Close the switch and watch the bulb.
3. Open the switch and watch what happens.
4. Swap the bulb for a buzzer, close the switch and listen.
5. Check all joins are tight if nothing happens.

What we changed	Bulb on or off / buzzer on or off

1. What happened when the **switch** was open?

.....

.....

2. Why did the **bulb** light only in a complete loop?

.....

.....

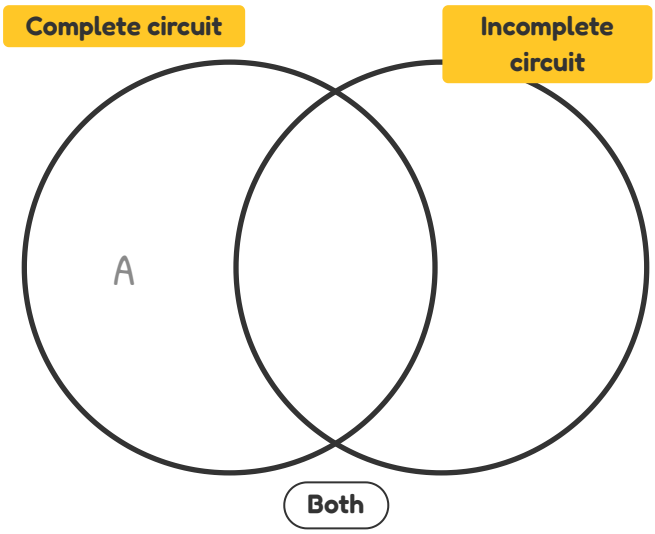
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Loop or Gap?

Sort what happens in complete and incomplete circuits.

↑↓ Task C Example done for you /5

Read each card. Decide if it fits a complete loop, a broken loop, or both.



- **A** ~~Buzzer sounds~~
- **B** Bulb lights up
- **C** Switch is open
- **D** There is a gap in the loop
- **E** Has a cell, wires and a bulb
- **F** Electricity flows all round

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What Matters Most?

Rank what helps a bulb light brightest.

Task D

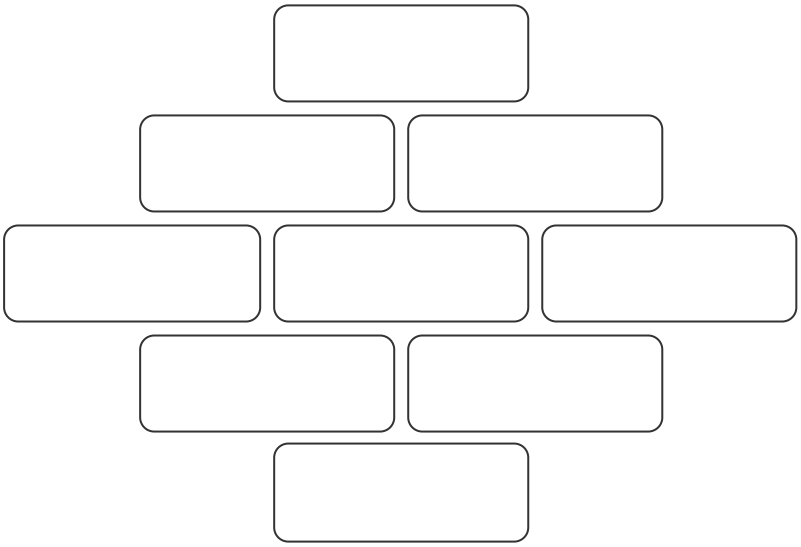
Cut out the cards. Put the most important for a working light at the top.

What is most important to make the bulb light?

Cut out the cards.

Join everything in one complete loop	Use a fresh cell	Close the switch
Connect wires tightly with no gaps	Put the cell in the right way round	Use a working bulb
Keep the buzzer out unless you need sound	Your own idea	Your own idea

▲ Most important



▼ Least important

Why did you put your top card at the top?

.....

.....

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Show What You Know

Check your ideas about parts and loops.

Task E

Example done for you

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Tick the best answer to show what your circuit does.

1. Which part gives the **power** in your classroom circuit?
   - [x] cell
   - [ ] bulb
   - [ ] switch
2. When will a **bulb** light?
   - [ ] when it is part of a complete loop with a cell
   - [ ] when there is a gap in the wires
   - [ ] when the switch is open
3. What does a closed **switch** do?
   - [ ] joins the loop so electricity can flow
   - [ ] uses up all the electricity
   - [ ] makes wires safe to touch with wet hands
4. A battery is made of two or more **cells**. Which is true?
   - [ ] two or more cells joined together
   - [ ] a bulb that is very bright
   - [ ] a switch left open

Task F

Example done for you

/4

Match each circuit part to what it does.

1 cell	◯ opens and closes the loop
2 wire	◯ makes sound when electricity flows
3 bulb	(1) gives power to the circuit
4 switch	◯ gives light when electricity flows
5 buzzer	◯ joins parts and carries electricity

How did I do?

Circle a face for each line.

I can name the parts of a series circuit.	☹	😐	☺
I can build a complete loop to light a bulb.	☹	😐	☺
I can explain how a switch opens and closes a circuit.	☹	😐	☺

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Answer sheet: Circuits That Work

Task A

Answers will vary, e.g. With a switch we can save the cell and turn the bulb off.

Task B

1. The bulb went off because the loop was broken.
2. Electricity can only flow all round when there are no gaps.

Task C

Complete circuit only: A, B, F
Both: E
Incomplete circuit only: C, D

Task D

Answers will vary.

Task E

1. a) cell
2. a) when it is part of a complete loop with a cell
3. a) joins the loop so electricity can flow
4. a) two or more cells joined together

Task F

1. cell → gives power to the circuit
2. wire → joins parts and carries electricity
3. bulb → gives light when electricity flows
4. switch → opens and closes the loop
5. buzzer → makes sound when electricity flows

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