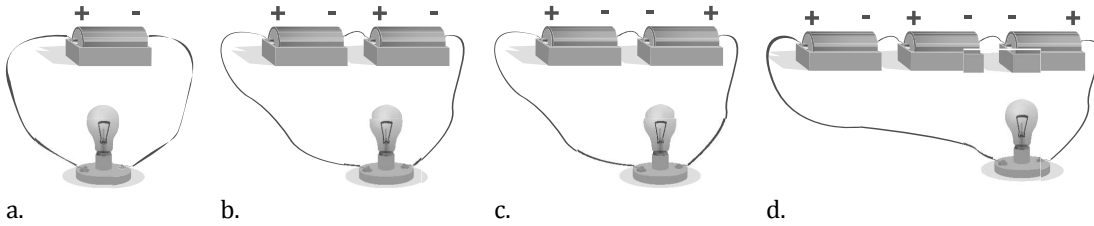


Which way round?

The bulbs in these circuits are all identical. The batteries are also identical, but look carefully at the + and - markings on them.



(a) In which circuit is the bulb brightest? Explain your answer.

(b) In which circuit is the bulb dimmest? Explain your answer.

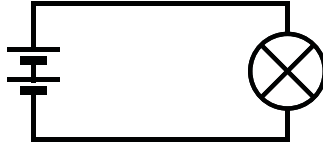
(a) In which circuit is the bulbs are the same brightness. Which two circuits are these? Explain your answer.

Adding a battery

One battery is connected to a bulb. The bulb is lit normally.



An extra battery is added.



a) What happens to the bulb? Tick one box:

- The bulb stays the same brightness.
- The bulb is lit, but not as bright.
- The bulb gets brighter.
- The bulb is not lit.

b) Which of the following help to explain this? Tick one box:

- The resistance in the circuit is smaller so the current is bigger.
- The extra battery pushes a bigger current around the circuit.
- With the extra battery more energy is transferred by the charges as they pass through the battery.

Removing a battery

Two batteries are connected to a bulb. The bulb is lit.



One of the batteries is then removed.



a) What happens to the current in the bulb?

Tick one box:

- It gets bigger.
- It stays the same.
- It gets less, but not zero.
- It drops to zero.

b) Which of the following is the best explanation for this?

Tick one box:

- One battery exerts a smaller push on the charges.
- The bulb always needs the same amount of current to make it light.
- The resistance in the circuit is less.