5 Matching batteries to a bulb

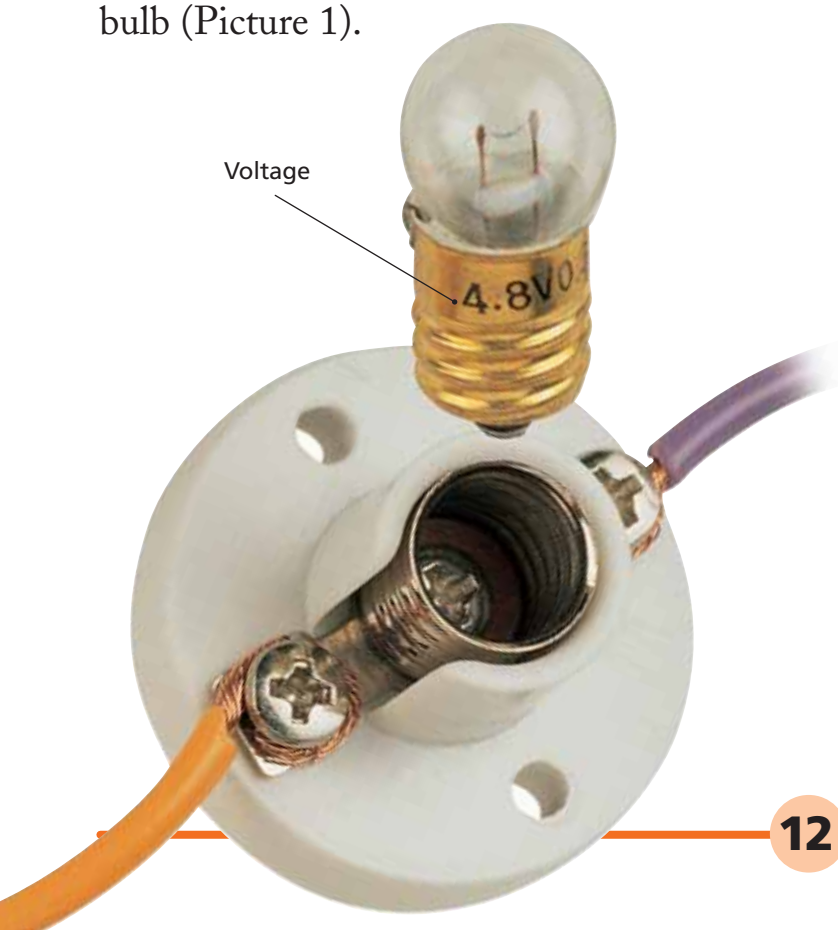
The pressure, or voltage, in the battery must be matched to the voltage of the bulb if the bulb is to shine brightly and not burn out.

Now that we have seen how a circuit connects **COMPONENTS** together, we must look a little more carefully at matching the bulb to the battery.

Looking for numbers

Batteries make electricity from chemicals. We can't change the amount of electricity that comes out of the battery. Each battery delivers a **VOLTAGE**, or electrical pressure, of one and a half volts (1.5V). You will find this printed on the side of the battery.

You have to match this number with the number on the bulb you are using. Look for the number on the side of the bulb (Picture 1).



Matching the numbers

How do you know how many batteries to use with the bulb? The answer is easy.

If a bulb has 3 volts (3V) stamped on the side, then you match this by putting two batteries in line. Remember: Batteries are 1.5 volts each and if you add 1.5 to 1.5 you get 3 (1.5 + 1.5 = 3). This is shown in Picture 2.

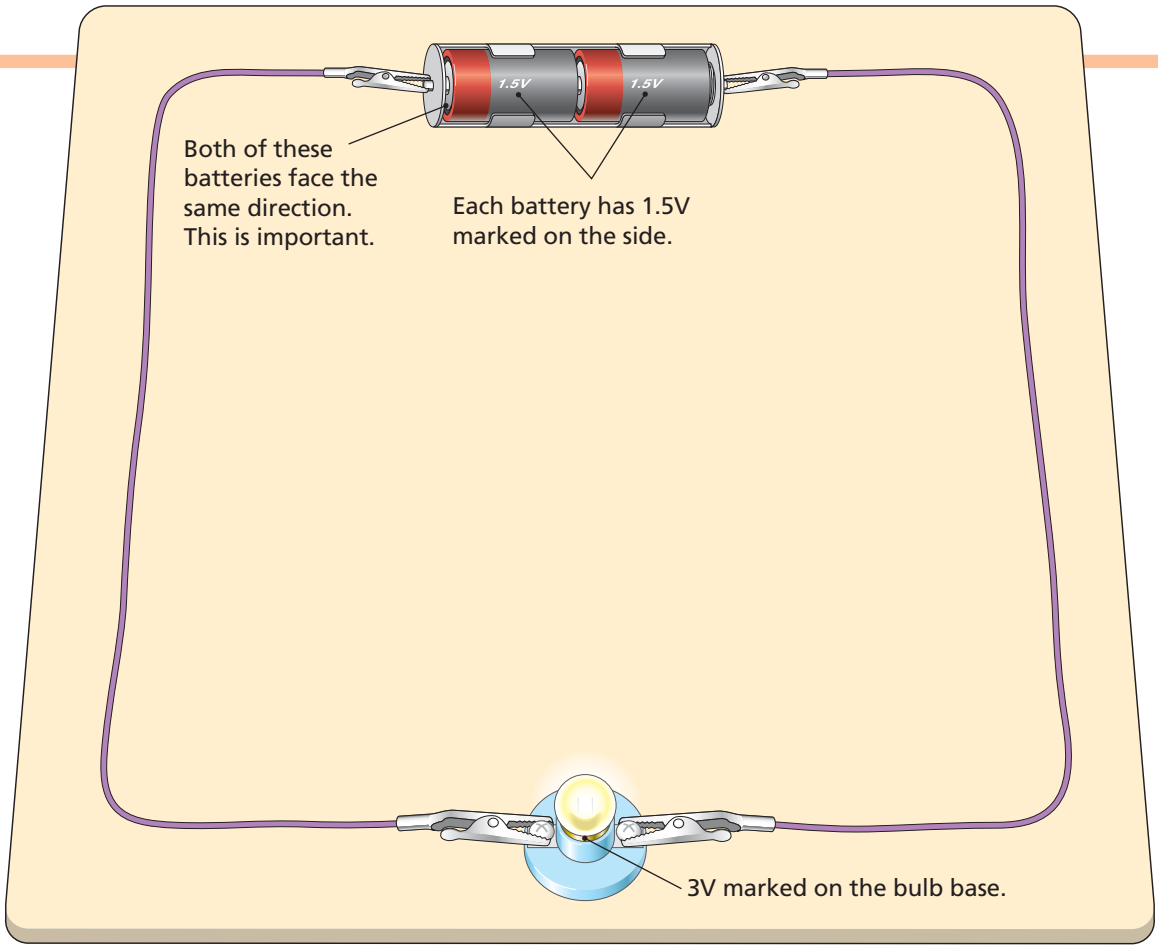
If you add too little

Suppose you put in too few batteries? Then there won't be enough electrical pressure to drive the electricity around the circuit and the bulb will be dim (Picture 3). However, if you are not sure what to do, adding fewer batteries is the safe option.

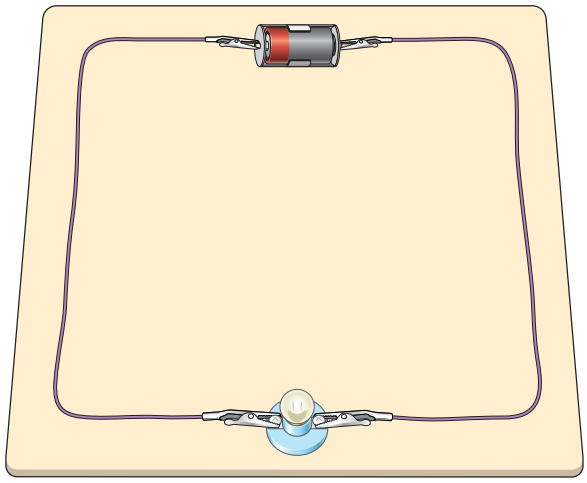
Don't add too much

If you add more batteries than the bulb makers intended, then the electrical pressure will be too high. The bulb will have too much electricity flowing through it and this will make the wire inside (the filament) too hot. It will produce a very bright light for a short while and then burn out (Picture 4).

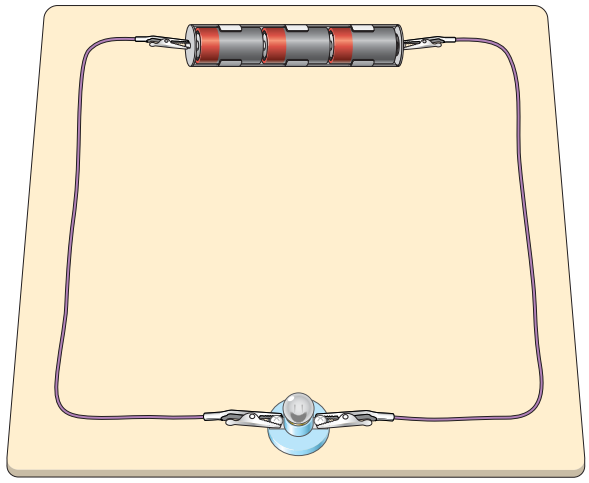
(Picture 1) Look for the correct operating voltage on the side of the bulb.



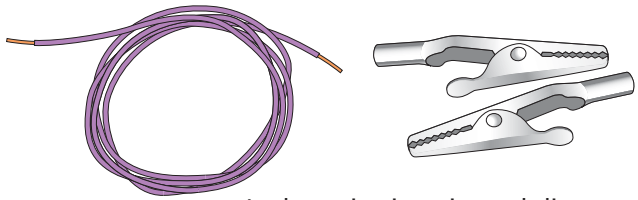
▲ **(Picture 2) Two batteries and a 3V bulb give the correct light.**



▲ **(Picture 3) Here, using just one battery results in a dim light.**



▲ **(Picture 4) Three batteries and only one bulb will cause the bulb to burn out.**



In these circuits, wire and clips are used to connect bulbs and batteries.

Summary

- **Match the number of batteries to the amount of voltage the bulb needs.**
- **Too few batteries and the bulb will be too dim.**
- **Too many batteries and the bulb will burn out.**