6.5 Predicting current and voltage

Science understanding

Logical/mathematical **Visual/spatial**

1 Predict the voltages of each of the light globes in the circuits shown in Figure 6.5.1. Write the voltage next to each globe.

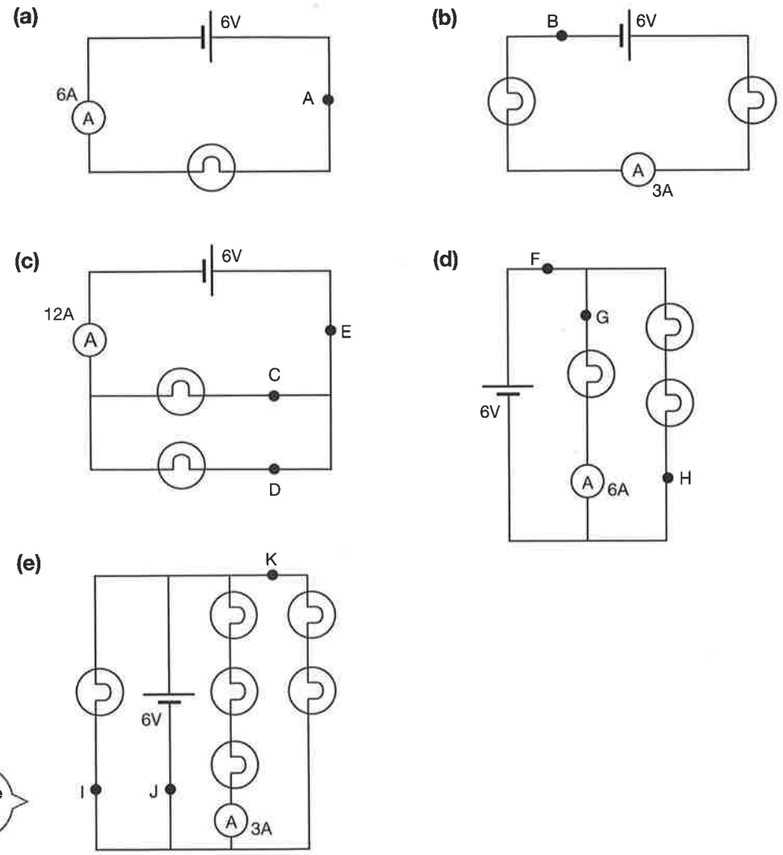

Figure 6.5.1

2 An ammeter is included in each circuit in Figure 6.5.1. From each ammeter reading, **predict** the current that is flowing through the points labelled A, B, C, D etc. in the circuits.

A = _____ A **B** = _____ A **C** = _____ A

D = _____ A **E** = _____ A **F** = _____ A

G = _____ A **H** = _____ A **I** = _____ A

J = _____ A **K** = _____ A

6.6 Keeping safe

Science inquiry

Verbal/linguistic

Electricity is so common that we all take it for granted. However, it is also incredibly dangerous. For example, a circuit can quickly overheat and catch fire if you piggyback double-adaptors or powerboards. To avoid this, use separate plugs. Likewise, coiled or looped-up leads and extension cords can rapidly heat up, possibly melting their insulation and exposing live wires. Straighten them out first. Electricity is most dangerous if you accidentally become part of the circuit! If that happens, current may flow through you to the ground. Serious burns or electrocution can result. To avoid this happening:

- never pull a plug from a power point that is on. Switch it off first.
- never use electrical appliances that have not been working properly or have been producing a burning smell
- never use anything with a lead or extension cord that looks old, or has been cut
- never use a plug with exposed wires
- don't stick metal or sharp objects into a power point or appliance. Turn off the toaster and shake out the slice of bread, instead of putting a knife in it.

Water can provide an easy route for electric current to flow through you to the ground. For this reason, never use an appliance or turn a switch on or off if you are wet. Dry yourself first. Likewise, never use electricity around swimming pools or filled basins or baths. For example, use your hairdryer in your bedroom, not the bathroom.

Never touch someone who has collapsed from electric shock, because they may still be part of the circuit! Turn off the power at the main switchboard and ring for an ambulance. Dial 000 from a landline phone. From a mobile, dial 000 or 112.

1 **List** the main safety devices that give some protection from electric shock and electrocution.

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2 **Explain** why power leads should be straightened out and not left in loops.

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3 **Propose** a reason why piggybacking double adaptors and powerboards off the one powerpoint can cause them to overheat.

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