



## Senior Level Lesson 5: Electricity Outdoors – Staying Safe

### Curricular Links

SESE › Energy and Forces › Magnetism and Electricity

SESE › Materials and Change

SPHE › Myself › Safety and Protection

### Objectives

1. Understand the dangers of electricity and how to stay safe with electricity outdoors
2. Understand the concept of metals as electrical conductors, as well as the use of lightning conductors in buildings
3. Identify how to stay safe with electricity outdoors

### Resources

Paper, pencils, items for investigation below and the Stay Safe, Stay Clear 6 Safety Tips. Additional resources including lesson plans and activity sheets are also available and can be accessed by visiting [www.esbnetworks.ie/education](http://www.esbnetworks.ie/education).

### Introduction

#### Think-Pair-Share

Ask pupils to think about what they know about electricity (ask them to recall Lessons 1 to 4), to discuss with a partner and to share with the class. Record ideas on the board and discuss as a class, for example:

1. Electricity is a type of energy which flows through wires or through the air and powers objects.
2. Electricity is generated in a power station usually using coal, peat, oil or renewable energy like wind or solar.
3. Electricity is brought by poles and overhead wires to homes and businesses. Pylons help to support overhead wires when electricity is travelling long distances. Mini pillars bring electricity into homes and businesses by underground cables.
4. Some materials are good electrical conductors (allow electricity to flow through), others are good insulators (do not allow electricity to flow through or slow the flow).
5. Electrocutation is a fatal electric shock.

### Development

#### Which metals conduct electricity best? – Investigation

#### ⚡ Teacher – remind pupils to stay safe around electricity.

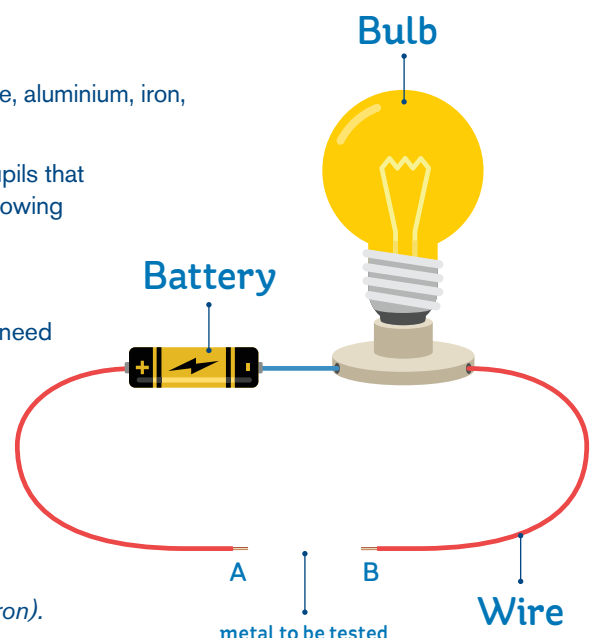
As a class, ask pupils to name any metals they can think of e.g. silver, gold, bronze, aluminium, iron, steel, copper, brass, lead, tin.

Recapping on the Conductors and Insulators investigation in Lesson 3, inform pupils that they are now going to carry out a similar investigation to examine which of the following metals – copper, aluminium and iron, are the best conductors of electricity.

As a class, or in small groups, ask pupils to carry out the investigation as follows:

1. You will need to set up a circuit as shown in the diagram. You will also need materials made from copper (e.g. copper wire); aluminium (e.g. drinks can); and iron (e.g. a nail).
2. Before you test each metal in your circuit, predict the conductivity of the metals from most effective conductor to least.
3. Then test each metal by using it to complete the circuit at A and B. What happens? Write your observations and compare with your predictions.

(Teacher – the bulb should light brightest for copper, then aluminium and then iron).





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Elicit from pupils that wires which carry electricity are normally made from copper as it is an excellent electrical conductor.

Then ask pupils to consider the effect of lightning striking a tall building or structure. Explain the following:

1. Buildings use lightning rods to prevent damage
2. These rods are metal strips usually made of copper or a similar conductive metal
3. These rods are usually placed up high so that if lightning strikes, it will strike the rod instead of the building as the electricity in the lightning bolt wants to go to ground and it will do this by the most effective means (through the most conductive material)

### Group Activity

#### *Unscramble*

Remind pupils how humans can also act as electrical conductors and of the importance of staying safe around electricity when outdoors. Recap on the Stay Safe, Stay Clear 6 Safety Tips from Lesson 2 with the following activity:

Write these jumbled sentences on the board. Ask pupils in groups to unscramble and write the Stay Safe, Stay Clear 6 Safety Tips to help them to stay safe around electricity:

1. near never wires climb trees overhead (never climb trees near overhead wires)
2. drone wires never fly near a kite or overhead (never fly a kite or drone near overhead wires)
3. overhead never fish wires near (never fish near overhead wires)
4. adult tell approach never a wire, fallen an (never approach a fallen wire, tell an adult)
5. pylon never a climb (never climb a pylon)
6. a sign danger away from places stay marked with (stay away from places marked with a danger sign)

When completed, discuss each safety tip, referring to pupils' personal experience as applicable.

### Conclusion

Give each pupil an A4 page, asking them to pick one of the Stay Safe, Stay Clear 6 Safety Tips and to create a poster to give other children the message about how to stay safe around electricity. Encourage them to give one clear message, using picture/s to reinforce it.

These posters can be entered into the Stay Safe, Stay Clear with ESB Networks Poster Competition. Winning entrants will receive prizes for themselves and for their school and will be featured in a calendar that will be sent to primary schools nationwide.

### Extension Activity

Create a class rap to inform other pupils in the school about how to Stay Safe, Stay Clear around electricity.