KS3 Electricity Lesson 9: Static Electricity
Teaching Ideas

Learning Objective:	To investigate static electricity.	Resources mixing bowl salt ground black pepper mass balance weighing boat wool cloth plastic comb PVC pipe aluminium can cloth bubble solution straw cloth polycarbonate sheet balloon plastic bags Van de Graaff generator (optional)
Success Criteria:	• **State** what static electricity is. • **Describe** how static electricity is produced. • **Apply** our knowledge of static electricity to its uses.	
Context:	This is lesson 9 in a series of lessons that covers the topic of KS3 electricity with a focus on static electricity. Students are asked to carry out a hands-on carousel of static electricity practical investigations. You can teach this lesson as a stand-alone lesson or use it to form the wider unit of work on the introduction of electricity. The choice is yours!	

Starter

Keyword Match

Students need to match the keywords to the definitions. Answers appear on a click.

Main Activities

The Atom

Use this slide to introduce the atom and the idea that all objects are made up of atoms; explain that each atom contains three different particles. Show students the labelled diagram of an atom; talk through the structure of the atom with students and the positioning of the subatomic particles. Discuss the charges and how this links to static electricity. You could test the memory of students by giving them one minute to see if they can draw an atom. A one-minute timer has been included to support with this activity.

What Is Static Electricity?

Use this slide to introduce the topic of static electricity. There is a video on static electricity which explains what static electricity is and some examples of experiments where static electricity occurs.

Static Electricity Investigation

Students are asked complete six short static electricity experiments. Place the experiment cards **Static Electricity Investigation Stations** around the room with the equipment. Prior to beginning the activity, present students with the **Static Electricity Investigation Questions** sheet. As students move from one station to the next, they should complete the activity sheet. The activity sheet is differentiated – gold is suitable for higher-ability learners, silver for middle-ability learners and bronze for low-ability learners. There is a video that demonstrates some of the experiments that students will be carrying out.

Van de Graaff

Introduce the Van de Graaff generator. Using the slide, you may choose to discuss the movement of the charges. There is a video that explains, using animations, how a Van de Graaff generator works. There is a gap-fill activity to test students' knowledge of how a Van de Graaff generator works; you may wish to do this as a class or as an independent activity. There is an opportunity here for self-/peer assessment of the answers. Remember to leave time for students to correct any mistakes. You may choose to use the Van de Graaff generator with students to demonstrate static electricity and ask for volunteers from the class to take part. You may want to spread the lesson out over two lessons and spend longer carrying out practical experiments on the Van de Graaff.

Dangers of Static Electricity

Ask students the following: how could static electricity be dangerous or a nuisance? Ask students to use the picture clues to help them answer the question. Encourage students to discuss it with their partner and then prepare students to share their answers with the class. There is a video on the dangers of static electricity where the team carry out an investigation into whether a mobile phone will cause an explosion near a petrol can. This is to simulate what could happen at a petrol station.

Ask students to suggest ways we can prevent explosions due to electrostatic sparks. You may choose to do this as a think, pair, share activity or you may wish to give pupils mini whiteboards and mind map suggestions before sharing them with the class.

Dangers of Static Electricity

Ask students the following question: why do birds not get an electric shock when they sit on the overhead cables? Ask students to think about the question, discuss it with their pair and then prepare students to share their answers with the class. Encourage students to include the keywords in their answer; you may want to ask students if they can remember the meaning of the keywords. There is a three-minute timer on the board to support with this activity. There is a video that explains why birds do not get an electric shock when sitting on overhead cables.

Teacher Note – Please check the content of these links, including any comments, are suitable for your educational environment before showing. Please do not let the next video automatically play at the end of the clip. Twinkl accepts no responsibility for the content of third party websites.

Plenary

Static Quiz

There are twelve questions to answer. You may choose to split the class into mixed ability groups. Students are asked to pick a numbered box and answer the question. If they correctly answer the question, their team gains a point. The team with the most points at the end wins the quiz.