

YEAR 4

PROFESSOR BUBBLEWORKS

Connections 2023
Working Scientifically



Year 4 Focus - Electricity

Introduction

We looked at a number of different demonstrations on your science day in relation to electricity including some of all of these: Plasma ball, energy stick and the Van de Graaff Generator.

Write down your favourite demonstration below:

What new words did you learn?

Describe what happened:

What could we have done differently to potentially get a better result?

Name at least 4 in each box:

Insulators

- 1
- 2
- 3
- 4

Conductors

Discuss in with a partner or group and write down the answer to these questions:

What types of electricity are there?

What item can store electricity?

Name the units we measure an electric current with?

Experiment: Static Electricity Experiments

Background science

“They say opposites attract and that couldn't be more true with our fun static electricity experiments. We will find out about positive and negative charges and how they can attract each other (pull together) or repel each other (push apart).”

What is Static Electricity?

Electricity is all due to negative charges. Normally, electricity can flow through wires in circuits to power things like light bulbs and TVs, but **static** electricity is where the negative charge builds up and stays in one place, because it can't flow away.

How is static electricity generated?

A static charge is formed when two surfaces touch each other and negative charges move from one object to another. Only things that are good electrical insulators can build up charge because conductors would let the negative charges flow away.

Is static electricity dangerous?

Yes it can be - Lightning is a powerful and dangerous example of static electricity, but the static electricity that we will be using today is very safe!

How dangerous is lightning?

As dangerous as lightning is, around 70% of people struck by lightning survive.

Equipment needed

Item	Tips
Balloon	Good quality latex balloons are best
Woollen Fabric	Most school jumpers work well
Other Items	Scrap paper (small pieces), other light items
Drinking or Tin cans	Beware of sharp edges

Experiment

Let's get hands on

Magic Moving Can

Instructions

1. Take your can and place it on the table
2. Charge your balloon and hold it close to the can without touching it
3. Move the balloon slowly towards you and the can should start rolling
4. Can you try to move/pick up other objects?

Review of Experiment

What's going on here?

Rubbing the balloons against the woollen fabric or your hair creates static electricity. This involves negatively charged particles jumping from one place to another. When you rub a balloon against your hair it becomes negatively charged. Because the balloons have taken some of the negative charges from your hair, the hair becomes positively charged

They say opposites attract and that is certainly the case in these experiments! Your positively charged hair is attracted to the negatively charged balloon and starts to rise up to meet it. This is similar to the aluminium can which is drawn to the negatively charged balloon as the area near it becomes positively charged, once again opposites attract.

Taking it further

Please now focus on one of these experiments and use your working scientifically sheet to really understand more about what's going on.

Workshop Scientifically

In order to conduct a test we need to think and understand more about what's go on. We will now make this into an experiment using the sheets below. In order to make this into a fair test we need to run through the steps described.

Think about the following and choose something to test:

- How you charge the balloon, the material and number of rubs?
- The distance the can rolls and the surface it's placed on.
- Weight of the can and if different metals change the outcome i.e. using aluminium, tin or steel.
- Add some water into the can to increase the weight, make sure you measure the amount.
- Try using the balloon to pick up different materials, what factors are in play here?
- Use a different material to rub the balloon on, such as your hair.

Use these ideas above to think about what you would like to find out then create your own experiment. If you can't decide then why not do multiple experiments, you can even try these at home with an adult.

Title of experiment:

What problem are we trying to solve?:

Equipment needed:

Item	Quantity/Amount	Units

Method (what will you do):



Predictions (What do you think might happen?):

Blank space for predictions.

Recording (use this space to record your results):

Blank space for recording results.

Evaluation (what happened):

Blank space for evaluation.

