



making physics matter

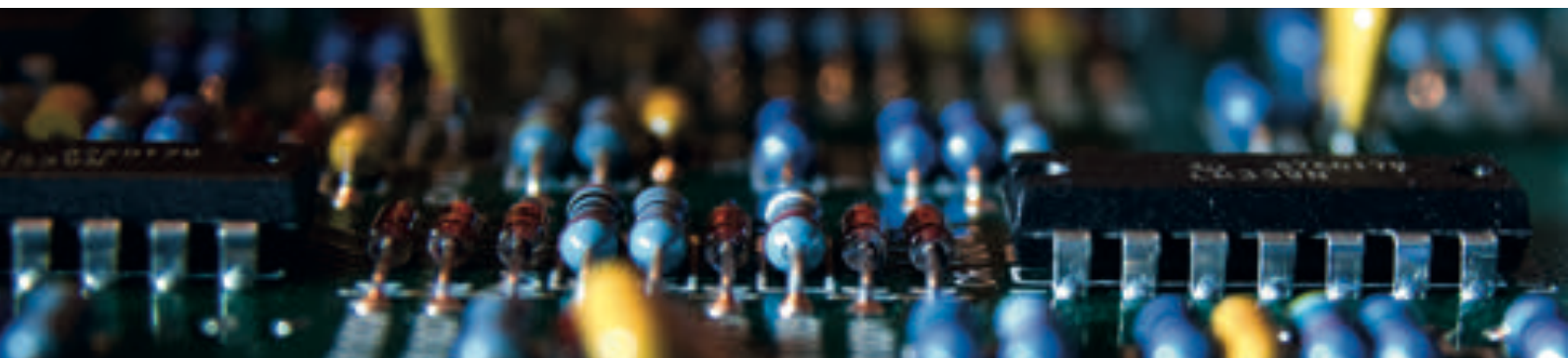


Age  
5-11  
years

# Phizzi focus

## Electricity

Electricity is a really useful area of the primary curriculum to provide opportunities for children to make links between their science learning and the real world through creative projects and problem solving. This Phizzi focus includes inspiration, links and resources to ensure that your electricity lessons spark wonder in the minds of your young learners.



### Sensational circuits

When learning about electrical circuits it is important that children are encouraged to link their learning to the use of electricity in their everyday lives. This provides a timely opportunity to discuss risks and hazards associated with electricity – the **Switched on Kids** website has a wonderful interactive section on 'electrical safety in the home' to help bring this topic to life.

The **Institution of Engineering and Technology** has a collection of electricity teaching resources for primary schools, including all the resources that you would need to run an electricity themed **Faraday Challenge Day** in your school. The DIY Faraday Challenge Day encourages pupils to consider how engineers work together to solve real-life problems. It enables pupils to experience the knowledge, understanding and skills engineers use within their work and the ways in which their strengths can be used to achieve an effective outcome.

For fun and creative ways for children to explore the basics of electricity and electric circuits, why not look at the **Ogden phizzi practicals**? You could also

construct squishy circuits using conductive and insulating dough. Children can create animated sculptures with embedded lights, motors and buzzers to bring their designs to life; **Dr AnnMarie Thomas'** TED talk provides a useful introduction. You can find recipes for the two doughs on the **Makerspaces** and **CLEAPSS** websites with suggestions about how to run this activity in the classroom. Most primary schools have membership of CLEAPSS through their local authority and can access a really helpful document offering health and safety advice on the use of batteries in the primary classroom: **P017 – batteries for practical work**.

With ideas about electricity often being quite abstract, teachers sometimes like to use models to help children imagine what is going on. While not all models are effective and can in fact cause misconceptions, used in the right way circuit models can really help to support the development of pupil understanding. Ogden Trust consultant, Carole Kenrick has put a great deal of thought into how models can be used to teach circuits in primary schools and has written a fascinating **blog** to share her ideas.

## Watt data?

The fair test enquiries that pupils carry out in Year 6, where they change the voltage across a circuit by adding more batteries and investigate how this effects components such as lamps, buzzers and motors, are really useful opportunities for pupils to apply their maths skills to their science enquiry. There are a range of free downloadable apps for measuring the brightness of light (eg LUX light meter) or volume of sound (eg Decibel X) that can be installed on tablets so that children can measure different quantities, repeat measurements and calculate the mean average of data sets. The data collected can then be analysed using line graphs, where children can create axes for voltage (x axis) against brightness or volume (y axis), learning how to plot data points and describe trends.

Electricity is also a useful and topical context for encouraging children to work with real-life data. Children often have questions about where mains electricity comes from and how we pay for it. **The Children's University of Manchester** has a fantastic website to support children learning about how electricity is made and used in our homes. Perhaps look at the school's electricity bill and find out how much electricity is used and what it costs? The children could then run a campaign to cut electricity use and check the impact on the next bill. Your pupils will learn about household electricity in key stage 3 but if you want to be reminded how the cost of electricity is calculated check out **BBC Bitesize**. Children could even research **electricity consumption around the world**.

## Electrifying English

There are many interesting characters that feature in the historic story of electricity. The Ogden Trust **electricity research cards** are a useful resource for preparing to write a biography or a chronological report. In fact, Benjamin Franklin, who features on one of the cards, was a printer, publisher and owner of the *Pennsylvania Gazette* so perhaps research into his famous experiment could be reported as a **newspaper article**?

There are a number of fiction texts with an electricity theme that could be used to support thematic learning – several Ogden partnership schools have found *The Boy who Harnessed the Wind* by William Kamkwamba, a really rich text for Year 6 classes. This inspirational book gives a detailed insight into what it is like to live in a land affected by drought and hunger and how one young boy's interest in electricity transformed a whole community.

## Creative currents

The topic of electricity can link to the wider curriculum which can provide pupils with more time to embed their new ideas about electricity and circuits. CLEAPSS has instructions on how to make a **steady hand game** or an **electrical greetings card** while *Whizz Pop Bang magazine* has a collection of free **electric art activities** to download from their website to use in art lessons or as science club activities.

Electricity also links well with humanities through projects such as Practical Action's **Power for the World Challenge** which has strong links with the geography curriculum, or the Ogden Trust electricity **ideas over time** timeline activities that link to ideas in the history curriculum.



## Electricity booklist

*Oscar and the Bird* by Geoff Waring

*Shocking Story of Electricity* by Anna Claybourne

*The Boy who Invented TV: The story of Philo Farnsworth* by Kathleen Krull

*The Boy who Harnessed the Wind* by William Kamkwamba (Young readers edition)

*Charging About: The Story of Electricity* (Science Works) by Jacqui Bailey and Matthew Lilly

*You Wouldn't Want to Live Without Electricity!* by Ian Graham

*Horrible Science – Shocking Electricity* by Nick Arnold

*Electricity and Magnetism* by E Humberstone



This book list was recommended by **Doug Ashton**, Science Lead at Kings Norton Primary School, Birmingham.