

# The Solar Challenge – Power to the people



*'It's a great way of teaching children that not everyone in the world has electricity and that solar cells can make such a big difference to people's lives' – Mrs McManus, Science Lead at Hillmorton Primary School*

## Circuits in the curriculum

Pupils in both primary and secondary school often set up circuits and learn how they function. They are used to pose questions such as: 'How can we classify materials as conductors or insulators?' and 'What happens if we put more bulbs into a series circuit?' This enables pupils to develop skills of fault-finding, spotting patterns in data and drawing conclusions. At secondary school, circuits can be used to introduce ideas about current flow, resistance and potential difference.

## Linking electricity to global issues

These are key skills and important concepts, but there's another dimension less commonly exploited... the way in which access to electricity can dramatically improve the lives of people living in poverty.

Electricity isn't just a tool of convenience that UK pupils associate with entertainment and social media; it changes lives by providing light and supporting agriculture, communication and more. This is why one of the Sustainable Development Goals, (17 goals agreed by the UN to eradicate poverty by 2030) focuses on this issue.

## The Solar Challenge

Practical Action produces high quality teaching materials that provide teachers with effective ways of exploring global issues linked to some of the ingenious science- and technology-based solutions the charity has developed working with communities in

developing countries. These materials enable teachers to make strong links between the ideas and skills pupils develop in lessons and real world applications. Their STEM challenges ([practicalaction.org/STEM](http://practicalaction.org/STEM)) give pupils the opportunity to develop their own solution to a global problem, to design, build and test it, then look at the actual solutions developed in that country. They are all accredited for the CREST award scheme and can be used as Big Bang competition projects.

The Solar Challenge links activities around circuits with the challenge of providing a village in Zimbabwe with electricity. The breakthrough in some such villages is the use of solar cells, obviating reliance on power distribution networks. Pupils explore solar cells power circuits and apply their ideas about powering bulbs, motors and buzzers to the way in which an African village can provide essential services.

Pupils start off by setting up circuits and exploring how the arrangement of components affects their behaviour. They then look at how batteries can be swapped for solar cells. Pupils see how not only are these a practical alternative, but also how susceptible they are to light intensity. The context then moves to a village that has had an array of solar cells installed. Demand outstrips supply and so crucial decisions have to be made. What should the villagers use the electricity

for? There is no one right answer and pupils are likely to develop different solutions. The important thing is for them to justify the decisions made.

By taking part, pupils will set up and test circuits, which enables them to learn about components, construction skills and 'Working Scientifically'. They will see how electricity can materially improve the quality of life in other parts of the world, understanding how it works and developing a wider range of skills including problem-solving and decision-making.

## Teaching resources

The full set of freely available teaching materials can be downloaded from [practicalaction.org/solar-challenge](http://practicalaction.org/solar-challenge). These include teachers' notes, pupil worksheets, a PowerPoint presentation, certificates and a poster. Pupils will need access to a range of equipment, including batteries, wires, bulbs, motors, buzzers and solar cells. A ready-made pack is available from TTS.

The Solar challenge is based on a project in Zimbabwe, Planting for Progress, which uses solar energy to power an irrigation system designed to double the harvest of farmers, lifting them and their families out of poverty. For more information, please go to [practicalaction.org/plantingforprogress](http://practicalaction.org/plantingforprogress). Any donations received by 8<sup>th</sup> March will be doubled by the UK Government.



Ed Walsh is a science author, curriculum developer, CPD leader and ITT tutor, and is a Regional Development Leader for the National STEM Learning Centre and a Senior Regional Hub Leader for PSQM.