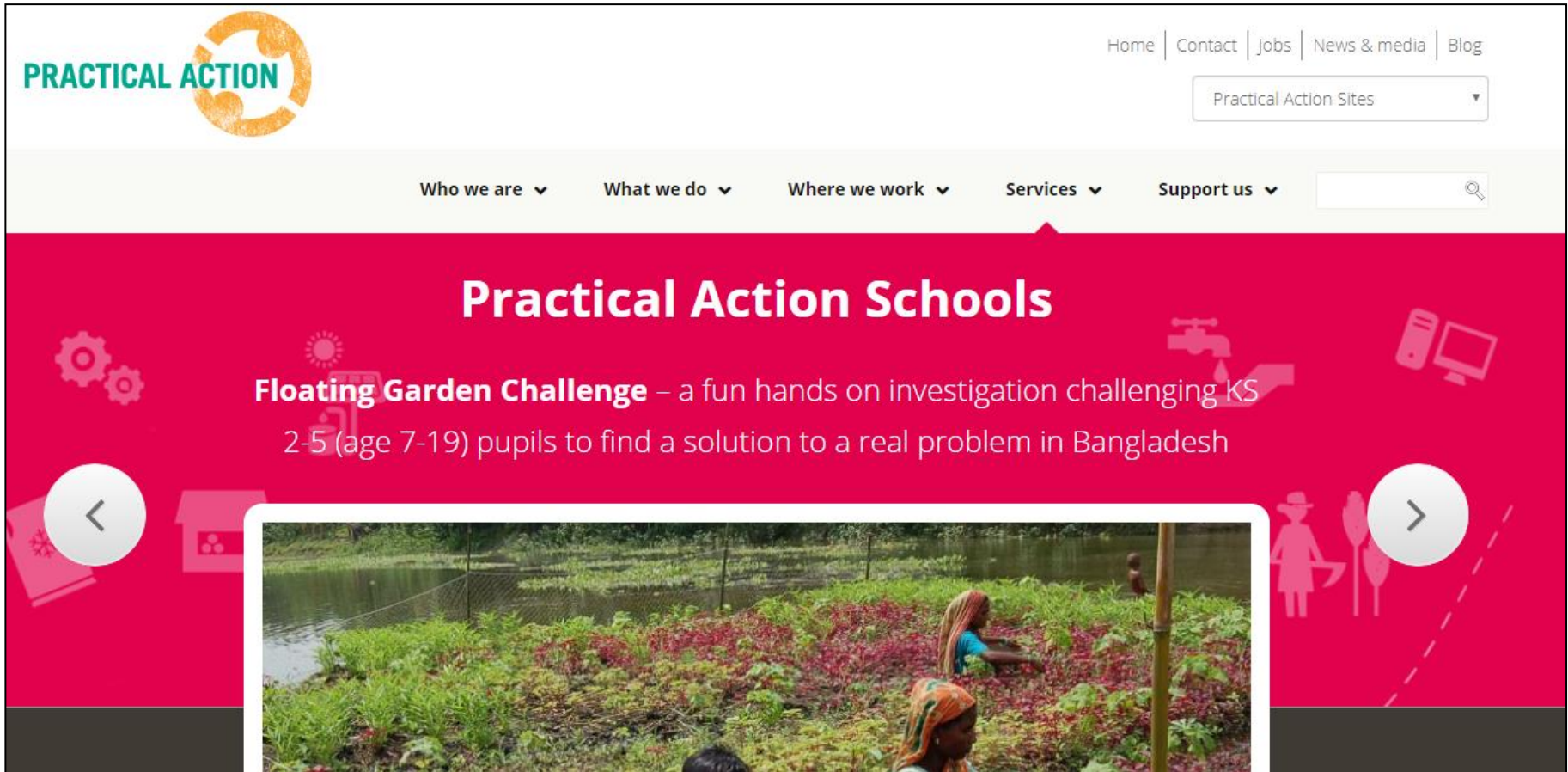


Practical Action STEM Challenges



The image shows a screenshot of the Practical Action website. At the top left is the Practical Action logo, which consists of the text "PRACTICAL ACTION" in green and blue, next to a circular orange icon with a white figure. To the right of the logo are navigation links: "Home", "Contact", "Jobs", "News & media", and "Blog". Below these links is a dropdown menu labeled "Practical Action Sites". A secondary navigation bar contains "Who we are", "What we do", "Where we work", "Services", and "Support us", each with a downward arrow. A search bar is located on the right side of this bar. The main content area has a red background with the heading "Practical Action Schools" in white. Below the heading is the text "Floating Garden Challenge – a fun hands on investigation challenging KS 2-5 (age 7-19) pupils to find a solution to a real problem in Bangladesh". A central image shows a floating garden in a pond with people working on it. The page is decorated with various icons like gears, a sun, a house, a computer, and a person, and includes left and right navigation arrows.

PRACTICAL ACTION


Home | Contact | Jobs | News & media | Blog

Practical Action Sites

Who we are ▾ What we do ▾ Where we work ▾ Services ▾ Support us ▾

Practical Action Schools

Floating Garden Challenge – a fun hands on investigation challenging KS 2-5 (age 7-19) pupils to find a solution to a real problem in Bangladesh



practicalaction.org/schools

Eco-Schools



Eco-Schools is a global programme engaging millions of children across 64 countries. The Eco-Schools Programme is pupil-led; involves hands-on, real-world learning and gets the whole school and the wider community involved in exciting environmental projects. For more information go to [Eco-schools](#)

Many of Practical Action's resources can be used to support the Eco-Schools topics, especially Global citizenship, energy, water, waste, healthy living, school grounds and transport.

To be awarded the Eco schools green flag pupils are required to show how the work they have done links to the curriculum. Using Practical Action's resources will not only engage pupils but clearly demonstrate many of these links, with a particular emphasis on science and design and technology.



Global Citizenship

Activities and resources to support pupils' work on the topic of global citizenship.

[Read more](#)



Transport

Activities and resources to support pupils' work on the topic of transport.

[Read more](#)



School Grounds

Activities and resources to support pupils' work on the topic of school grounds.



Healthy Living

Activities and resources to support pupils' work on the topic of healthy living.

Popular challenges

CAN YOU STOP THE SPREAD?

Research (DROB NO2): Working together in a team, an employer or challenge sponsor, e.g. product developer or engineer, researcher and science communicator. Research infectious diseases and see how they are spread. Find out about the Global Health and how they are spread. Take part in fun activities to help your understanding.

Design your model (DROB NO3): Think about a model that can be used for hand washing. What materials will you use? Try to make your model as lightweight as possible. You will have a budget to be careful not to go over.

Build your model (DROB NO4): The Ditch the Dirt team will be building your model. You may find that you need to adjust the way you built it. Don't worry. You can change it. Don't worry.

What is the problem? Infectious diseases cause death and illness to millions of people each year in the developing world.

What could be a solution? Providing a way for young children to wash their hands regularly and understand why hand washing is important is one way to reduce the spread of infectious diseases.

Your challenge Imagine you are working for an international development charity. Your job is to build a hand washing device for children in a primary school in Kenya and help them understand why they should wash their hands.

Drop NO5 Record and share your work with others. Design a way to record your work. Share your work with others. Design a way to share your work with others. Design a way to share your work with others.

Drop NO6 Create materials for primary school pupils. Design a way to create materials for primary school pupils. Design a way to create materials for primary school pupils. Design a way to create materials for primary school pupils.

Drop NO7 Record and share your work with others. Design a way to record your work. Share your work with others. Design a way to record your work. Share your work with others.

Drop NO8 Evaluate the work of others. Select the other groups present there. Tell them what you like about their work. Tell them what you like about their work. Tell them what you like about their work.

DITCH THE DIRT

a challenge to filter dirty water

Our Ditch the Dirt Water Filter

Filter test results

DITCH THE DIRT
a challenge to filter dirty water

DID YOU KNOW...

- One billion people in 85 years living in poor homes in cities and towns with no drinking water.
- Drinking water contaminated with people's feces or dirt. Every day nearly 1,000 children die from water-related diseases.
- Women and children walk an average 3 miles a day to collect water from water holes that are often dirty and contaminated.
- The Ditch the Dirt team has set up the challenge in the world to create water filters that are better, cheaper and easier to use.

Practical skills to be developed The new challenge is to be a primary school teacher or a primary school teacher.

Content

The Squashed Tomato Challenge

Challenge your students to take on a real-life problem affecting people in Nepal. Work with them to find a way to move tomatoes down hillsides without squashing them.

What's the challenge about?

- A few hectares are under cultivation across 432-450 students based on a real transportation problem being faced by the residents of Nepal.
- Enrichment activities - for STEM and Natural Science and Engineering Week.
- CECIS in a day.
- KS2A science curriculum on forces, friction and levers.
- Open partnership opportunities.

Running the challenge

Prepare the challenge by ensuring the various aspects which need to be transported down the hillsides are in place. This includes: **balls, boxes, paper, etc.**

The problem Many farmers in Nepal grow their own tomatoes on the hillsides. They need to transport them to the bottom of the hillsides. But the hillsides are so steep that they need to create a path. Tomatoes are quite easily squashed so need to be transported with care. You can demonstrate this by dropping a ball - the harder it falls, the more it squashes.

The challenge Set the context of the challenge by showing the problem faced by farmers in Nepal. You could show the children some of the images from Nepal. They should work in small groups to design and build a model that can transport an object down the hillsides in the same time without squashing them.

Congratulations!

Practical Action's Squashed Tomato Challenge

A collage of images showing the 'Ditch the Dirt' challenge in action. It includes a person in a green hat and yellow bag collecting water, a colorful woven basket, a woman in a red sari, a woman in a green sari, a woman in a pink sari, and a woman in a pink sari. There is also a sign that says 'We work for better environment' and a blue woven basket.

THE SOLAR CHALLENGE

THE SOLAR CHALLENGE

Over one billion people in the world today are living without access to electricity.

How can electricity generated from solar cells help us reach the Sustainable Development Goals (SDGs) and make a big difference to the lives of people in rural Zimbabwe?

ELECTRICITY GENERATED FROM SOLAR CELLS CAN BE USED TO HELP.

HOW MUCH ENERGY DO ELECTRICAL APPLIANCES USE?

Statistical energy is measured in kilowatts. This table and pie chart show the electricity used by some of the most common household appliances. The electricity meter shows how many kilowatts have been used. The more units used – the more at a home, the more.

Appliance	Power rating of appliance (kW)	Number of hours appliance is normally used per day	Amount of energy used per day (kWh)	Amount of energy used per day shown graphically (shaded area on the circle)
100W filament bulb	0.1	5	0.5	[Shaded area]
100W TV				[Shaded area]
100W heater				[Shaded area]
100W radio				[Shaded area]
100W fan				[Shaded area]
100W power drill				[Shaded area]
100W hair dryer				[Shaded area]
100W electric kettle				[Shaded area]

BUILDING CIRCUITS TO EXPLORE THE USE OF SOLAR CELLS

In these activities we are going to be looking at how solar cells can be used to provide power for circuits.

1. GETTING THE POWER

The first thing to do is to think about how to use a battery in a circuit.

TRY SETTING UP THESE CIRCUITS:

- Connect a battery in a bulb – find out what happens and write it down here.
- Now connect the battery to a solenoid – find out what happens and write it down.
- Now try connecting the battery to a motor – make a note of what happens.

Batteries can be recharged with a solar cell! The solar cell can then be used to do the same job as a battery. Find out if the bulb can be powered by solar cells and write down what happens.

- Set in rural southern Zimbabwe
- Pupils investigate different circuits which include solar cells



Teacher's Guide

A guide to help teachers run the Solar Challenge and Off-Grid! Design competition.

[Download](#) (3.29MB)



PowerPoint

A presentation to support teachers run the Solar Challenge and Off-Grid! Design Competition.

[Download](#) (12.99MB)



Pupil activity sheets - Primary

All the activity sheets needed for primary pupils aged 8-11 to enjoy the Solar Challenge

[Download](#) (5.46MB)



Pupil activity sheets - secondary

All the activity sheets for pupils aged 11-14 years to enjoy the Solar Challenge.

[Download](#) (5.52MB)



Certificates - Well Done

Certificates to award your pupils for taking part in the Solar Challenge.

[Download](#) (118KB)



Certificates - Congratulations

Certificates to award the team who best met the challenge criteria.

[Download](#) (128KB)



Poster

An engaging downloadable version of the Solar Challenge poster.

[Download](#) (1.33MB)

THE SOLAR CHALLENGE

OFF-GRID!

Running until June 2019, our Off-Grid! Design Competition is an exciting opportunity for young people aged 8-14 years to extend their work on The Solar Challenge.

Eligibility: Schools and pupils in the UK are welcome to enter. We are happy to accept entries from children who are not in a formal school setting and from children taking part in youth groups.

Age categories: There are two age categories. Primary pupils (aged 8-11years) and secondary pupils (aged 11-14 years). Pupils can enter individually or in a teams of up to four pupils. Please note that due to GDPR we cannot store pupils' names so pupils should enter using a team name or a pseudonym.

Prizes: Practical Action will award the winning primary school and secondary school a £100 worth of STEM kit from TTS. Each pupil(s) in the winning team will receive a £10 voucher and a STEM book.