

## Session 2: Working towards the Global Goals: STEM Solutions

Age 14-18

Time: 1 hour

### Outline

This session introduces the Barefoot solar initiative as a STEM solution, and helps students to recognise how innovations in Science, Technology, Engineering and Maths can help to improve problems around the world. Students put their learning into action by building a solar power car.

### Learning objectives

- To introduce the concept of STEM, and what this means in real life.
- To put their learning into action by building their own solar power powered car.

### Learning outcomes

- Students will recognise how the Barefoot solar initiative is helping to improve the lives of poorer people in different communities.
- Students will understand the impact that STEM innovations can have in finding solutions to challenges being face around the world.

### Preparation

- Watch Barefoot film, and make sure this is loaded ready to use.
- Slides 1-6 are to be used on screen to guide you and the pupils through the content of the session. Slides 7-11 are innovation case studies and should be printed out for pupils to read and discuss: 2 copies of each. Solar car instructions are on slides 12-13. Print copies of these for pupils.
- In advance of the session, try out building the solar power car. Adapt the time for this activity on the session plan as necessary – you may need to prepare parts of the car in advance.
- Think about a suitable reward you could use for the solar power car activity. If you are in a school, this could be house points.
- Ensure you have post-it notes for the plenary activity.

## Getting started (15 mins)

Refresher: working in pairs, students have 3 minutes to discuss what they learned about during the last session, and to agree on the most important thing they learned. Take feedback from the group.

Discussion of take-home task from session 1 (optional): Students share the positive actions they found out about related to achieving the global goals. If students didn't complete the task, ask them if they can think of any activities happening in their communities that will help to achieve the goals?

Emphasise with students that as their research showed, although there are many problems in the world, there are many ways to improve them.

Students watch Barefoot film, part 2. Following the film, ask students: what are the women in the film learning? What will they be able to do with their new knowledge? Elicit from students that the women are learning about solar energy, in order to 'electrify' (bring electricity to) their communities. As a result, the women will be able to go back home and teach others these engineering skills, bringing about positive long-term change.

Look back at the graphic of the global goals from session 1. Which 7 goals does the Barefoot solar project relate to? These are: 1 – no poverty, 5 – gender equality, 7 – affordable and clean energy, 8 – decent work and economic growth, 10 – reduced inequalities, 12 – responsible consumption and production, 13 – climate action.

Take feedback from the class, and point out any of the goals students may have missed.

Explain to students that there are many different ways of creating change to achieve the global goals. The Barefoot project, which uses solar energy, is an example of a STEM innovation – people working creatively in Science, Technology, Engineering and Maths to find solutions to the world's biggest challenges. STEM innovations are one way to help ensure we use our resources effectively and sustainably so they last over the long term. When someone develops a STEM solution that works, this can be shared across countries and across the world so that everyone can benefit.

## Learning activity (30 mins)

### *Examples of STEM solutions*

Students are given further examples of STEM solutions. Divide the class into 5 groups, and give each group a case study of a different innovation. In their groups, students discuss the following questions: What is the problem being solved? Who does the problem affect? How is the innovation a solution to the problem? What difference could it make?

Students present their innovation back to the group. Students vote on which they think is the best innovation, and which they think will have the biggest impact.

## Learning activity (30 mins)

### *Solar power in action*

Explain to students that they will be using a real-life example of a STEM innovation, by building their own solar power cars!

Following the printed instructions, students work in pairs to build a solar powered car. You could give a reward to the first 3 pairs to complete building their cars.

Reflection questions: How easy was it to build their car? Did their car work right away? If not, why? How would this innovation work here, or in other countries in the region?

Explain to students that while STEM can help find solutions to problems, it's important to think about whether they can be used everywhere, or if they need to be adapted for different places. For example, solar power might not work so well in a cloudy country!

### **Plenary (15 mins)**

Students write on separate post-it notes at least 3 things they learned during the session. This should include one thing about the Barefoot solar project, one thing about other STEM innovations, and one thing they learned from the solar car activity.

Using a space that is divided into the 3 categories, students stick their post-it notes to the correct section and take a few minutes to read each other's feedback. Review with the group what they have learned.

Collect students' post-it notes – these will be used for evaluation.

### **Take-home task (optional)**

Students research solar energy, and find 3 more examples of technologies where it is being used. In what careers could you use STEM skills?