

Session: Power Your Future

Key Stage: 2

Lesson focus: An interactive career-related learning session focused on renewable energy.

Duration: 2-3 hours

Learning Objectives:

- Learn about how renewable energy powers our world.
- Understand the basic science behind wind turbines.
- Conduct an experiment.
- Design a futuristic school.
- Explore job roles linked to renewable energy.

Subject / Curriculum Links:

English – speaking, listening, and sharing ideas
Science – investigating energy and power
Design and Technology – using creative skills
Maths – using grid references
PSHE – develop skills for success

Resources:

- Power Your Future KS2 PowerPoint
- Higher or Lower Resource Cards
- Worksheets 1 & 3
- Worksheet 2 if doing extension activity
- Worksheet 4 – or just plain paper
- Scissors
- Glue sticks
- String or ribbon
- Pencils and coloured pens/pencils
- Career Volunteer* (optional extra)
- Career Learning Log** (optional extra)

Skills Builder Links:



Set up: Use the accompanying PowerPoint (PPT) for this session. The notes on the PPT should support delivery. Check your sound works as this will be needed for the videos.

Step 1: Introduction

Slide 1 – Introduce the session; we are focusing on renewable energy and jobs in the energy sector.

Slide 2 – Explain to the students the learning outcomes for the session.

Slide 3 – Explain how this session links to other school subjects making the link to what they learn in school and the world of work.

Slide 4 – Explain that there are certain skills that are important in all jobs. Each picture represents a skill: speaking/communication, listening, teamwork, problem solving. Ask the students to guess what skills each picture represents. You could ask the students to rate themselves on each skill, using thumbs up, middle or down.

Step 2: STEM

Slide 5 – Ask if they know what STEM stands for. Discuss what STEM means and that many future jobs will be STEM focussed.

Optional extension task: in pairs students come up with a list of jobs that use STEM. Use the notes in the PPT to explain the further uses of maths.

Slide 6 – What is an engineer? ‘A problem solver’. Introduce students to the role of an engineer highlighting that there are lots of different types of engineers.

Slide 7 – In pairs, students identify items that engineers have made/ are responsible for. Get feedback from students. If whiteboards are accessible students can write a list on a whiteboard. **The answer is that everything apart from the living things in the room will most likely link to STEM and will have needed an engineer to help create them.**

Step 3: Energy and power

Slide 8 – Identify items that use electricity. This can be run as a class activity or let the students discuss in pairs. Ask them where they think electricity comes from.

Slide 9 - Where do we get energy from? Heat, light movement.

Slide 10 – What is energy? ‘The ability to do work’. Use slides and notes. Key word: kinetic.

Slide 11 - Have all of the students rub their hands together, notice that they are warming up. Ask them what type of energy this is – kinetic and heat.

Slide 12 – What is power? ‘The amount of energy used in time’. Power is measured in Watts.

Slide 13 – Higher or Lower Challenge. Activity using ‘**Higher or Lower Resource Cards**’. Hand out the printed electrical items to students, and have the class place them in order of lowest to highest in terms of how much power they use per hour. Have students stand in their final order at the front of the class before revealing the answers on the slide.

Slide 14 - Recap power and energy.

Slide 15 – Understanding renewable energy: from a source that does not run out. Students try and identify 3 sources of renewable energy: sun, wind, wave.

Slide 16 – Renewable energy. Finish the sentences (the answers will appear with each click):

- To convert the sun’s light energy, we have... solar panels
- To convert wind’s movement energy, we have... wind turbines
- To convert water’s movement energy, we have... water turbines

Explain that later in the session we will be focusing on wind turbines.

Step 4: Fantasy Island Challenge – Worksheet 1

Slide 17 – Jobs in renewable energy are amongst the fastest growing jobs in the country. In the UK we are looking to support 27,000 new jobs in off-shore wind power alone!

Slide 18 – Using **Worksheet 1 Fantasy Island Challenge** students cut the renewable energy sources out and stick them on the map where they think best appropriate/will convert the most energy.

Slide 19 – *Optional extension of fantasy island* – Using **Worksheet 2 Fantasy Island Extension** students write down the coordinates of their renewable energy sources and write explanations about each one. After the activity, discuss the children’s answers.

Step 5: Wind Turbines

Slide 20 – Where are wind turbines used?

Slide 21 - What are the benefits of wind turbines? On a really windy day, wind turbines can generate up to 40% of the UK’s energy!

Slide 22 - 60 second video on how wind turbines generate electricity.

Step 6: Experiment – use **Worksheet 3 Wind Experiment**

Slide 23 – Where is best to place a wind turbine in school? Students will conduct an experiment to decide which area of the school would be best to place a wind turbine.

Step one: As a class, decide which areas of the school to test where would be best to place a wind turbine. For example: The classroom, front of the school, grass area, playground area, lining up area. On the worksheet, write down the locations and their prediction for the best (windiest) location.

Step two: Each student/group gets their piece of string or ribbon.

Step three: As a class, move to location number one. Altogether, time each test for 30 seconds. Students hold their string high in the air to measure the power of the wind. For 30 seconds, observe the wind blowing the thread; the larger the angle and the more it is moving, the higher the wind energy at the location.

Step four: Rate the location on a scale of 1 – 5, 1 being the least windy, 5 being the most. Record the results in the table.

Step five: Repeat the experiment in several different locations and record the results in the table.

Slide 24 – Results. Ask the students where they would choose to put a wind turbine based on their experiment results.

Slide 25 – How are wind turbines made?

Slide 26 - Show this engaging video designed for primary aged pupils to showcase careers in the renewable energy sector. <https://www.youtube.com/watch?v=wTLmw8gjUZQ>

Step 7: Design – Use **Worksheet 4: Design a Sustainable School of the Future** or just plain paper. Pupils will also need coloured pens/pencils.

Slide 27 - Explain what sustainability is - sustainability is the idea that humans must interact with the environment in a way that ensures there will be enough resources left for future generations. It is being aware of and accountable for the impact they have on the environmentally.

Begin with a conversation on how we could help create a more sustainable school – focus on other energy sources, waste in school, how people travel to school and so on.

Design task: Now the students should cast their minds into the future- what will schools look like 50 years from now? Have a conversation about the possibilities for powering the school in the future.

Task – Design a green school of the future. Using the renewable energy sources they have learnt about, as well as their own creative ideas, they should design and label a school of the future. For example: 'all teachers pedalling on bikes in order to power the boards in the classroom!'

Slide 28 – Present. Select a few students with interesting ideas to come to the front of the class and share their future school design ideas. Throughout the activities notice any students who particularly exceed in any of the Skills Builder skills and have them fill out the skills page in their Career Log (see below for link to these).

Slide 29 – Discuss. What jobs will be needed to design and build your future school? As a class discuss all the different jobs that will be needed to design and build a sustainable school. Use the PPT notes for suggestions and list the jobs on the board.

Step 8: Meet the Career Volunteer*

Slide 30 & 31 - You can really bring this lesson to life by inviting career volunteers from the world of work to talk to your children about their careers. Having the opportunity at primary school to meet a wide range of people doing different jobs is really important and hearing them talk about their careers can be so inspiring! There are some great online portals that are easy to use to link with employers and invite volunteers into your school. Alternatively, you can use these portals to arrange interactive virtual encounters with volunteers from the world of work. Live streaming volunteers into your classroom can be an easy, safe and effective way to connect with inspiring volunteers.

- Visit the Primary Future Portal: <https://primaryfutures.org/schools/how-to-sign-up/>

You can invite a Career Volunteer to join either virtually or in person for this activity. For this activity you ideally want to invite a volunteer who works in engineering or the energy sector.

Step 9: My Career Learning Log**

Slide 31 - Remember to use the **My Career Learning Logs** during or following this activity. Explain how it works:

- Use this to keep a record of all the career related learning you do
- Each time you practice a skill you achieve a stamp
- Each time you learn about a new job or career you achieve a stamp

Visit the resources platform to download the careers logs: <https://ourfuture.startprofile.com/page/ourfuture-ks2#careers>

Plenary / Assessment questions:

Ask pupils to share something new they have learnt from today's session. Remind pupils they can become anything they want to be and will be successful if they keep on developing their transferrable skills.

What is movement energy? Kinetic.

What is power measures in? Watts

What is renewable energy? Energy that will not run out/ from a renewable source.

Can you give an example of a renewable energy source? Sun, wind, wave.

What is an engineer? A practical problem solver.

Did you know?

Although wind turbines cost a lot to set up, they produce a large amount of energy that is clean with no carbon emissions. One spin of a wind turbine blade can power a home for up to 2 days!