

Electricity Lesson 1 | Lesson Outline



Learning intention:

Pupils will explore how gears work to transform slow rotation of turbine blades into fast rotation that allows a generator to generate electricity, and understand that engineering skills are important for careers in electricity generation.

Resources Introductory Video - Our Energy Use (4min 36sec) Instruction Slides - Turbine & Gears Template - Turbines & Gears Worksheet 1a - Turbines & Gears Worksheet 1b - Turbines & Gears Extension Worksheet 1a & 1b - Answers	Per group or pupil: Corrugated cardboard, scissors, glue stick, Blu tack/plasticine, pencil, split pins, card or paper.
Hook into the lesson	Play Introductory Video – Our Energy Use . The video introduces the topic of renewable energy, before focusing on electricity generation. The video asks the following questions, giving opportunity to pause and discuss (or pupils could write individual answers): <ul style="list-style-type: none"> • Why are electricity, transport and heat important to you? (1min 58sec) • What do you know about renewable electricity? (3min 9sec)
Activity	Pupils will investigate how different sizes of gear can be used together to turn the slow rotation of wind turbine blades into the fast rotation needed to produce electricity. Using Instruction Slides – Turbines & Gears , explain to pupils how the slow spin of wind turbine blades generates electricity. Give pupils Worksheet 1a – Turbines & Gears . Following instructions on Instruction Slides – Turbines & Gears , pupils will create cardboard gears. Run in groups with recommended group size of 2-4 pupils. Give each group two Template – Turbines & Gears sheets. Each pupil in the group will create one gear and work with their group to complete the worksheet.
Extension	Give pupils Worksheet 1b – Turbines & Gears Extension . Continuing with Instruction Slides – Turbines & Gears , pupils will further explore the cardboard gears by investigating the mathematical relationship between the size of gears rotating together.
Plenary	Lead a class discussion on the following questions, related to gears, engineering and the skills needed for engineering careers. <p>Q: What skills did you need to carry out the gears investigation? <i>A: Problem solving, team work, communication, maths, construction</i></p> <p>Q: What are some other uses for gears in everyday life? <i>A: Clocks and watches, bikes, cars, tin openers, drills</i></p> <p>Q: Why are gears needed in wind turbines? <i>A: They are needed to take the slow spin of the wind turbine blades and transform it into the fast spin needed to generate electricity in a generator.</i></p> <p>Q: Engineering skills are needed to make and build objects and buildings that we use every day. Look closely at the tables and chairs around you. What skills did people need to make them? Think of a time recently that you used engineering skills to make or fix something. Share what you did with the people around you.</p>