

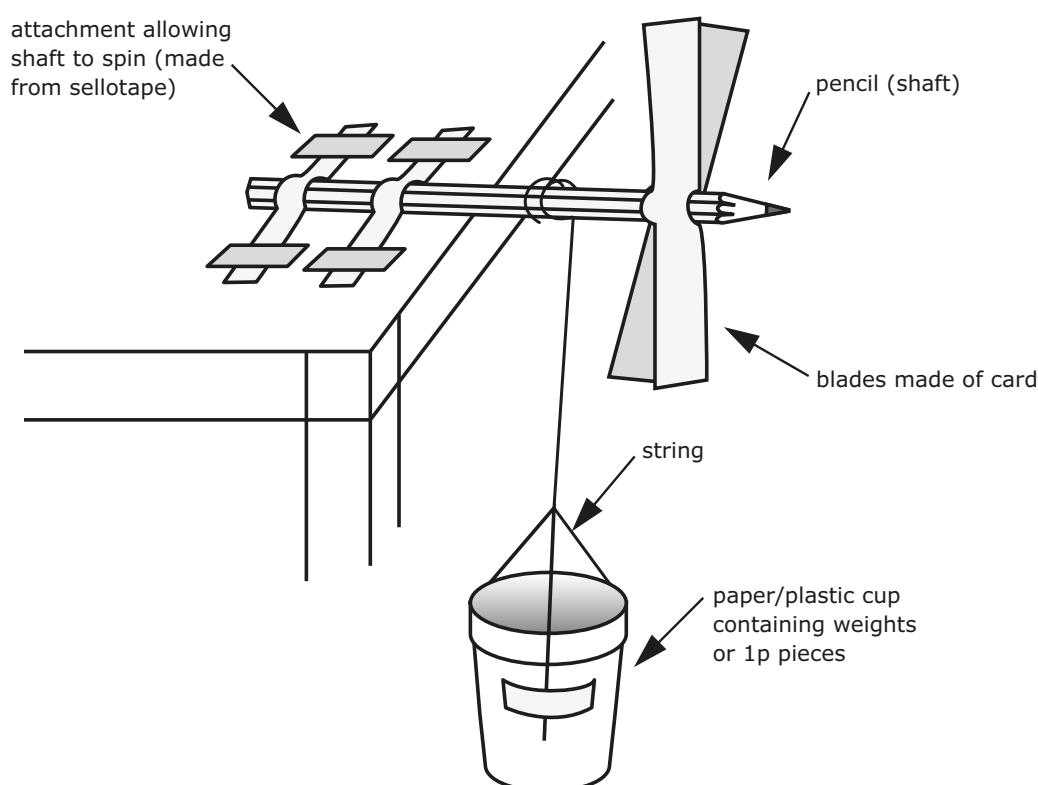
THE WIND POWER CHALLENGE

7 AFFORDABLE AND
CLEAN ENERGY



Ask pupils to design a simple wind turbine capable of lifting a cup off the floor up to bench height. The winning team will be the one producing a machine that lifts the most weight.

Possible design



For each group set out a tray containing

- | | |
|---------------------------|-------------------------------------|
| ✓ Scrap card | ✓ Scissors |
| ✓ Sellotape | ✓ String |
| ✓ Masking tape (optional) | ✓ Paper/ plastic cup |
| ✓ Pencils | ✓ Weights (gram weights or pennies) |

You will also need at least one hairdryer. Ensure all hairdryers are of the same power rating.

EQUIPMENT

THE WIND POWER CHALLENGE

Running the challenge

Introduce the challenge to your pupils by explaining that access to energy is an important factor in helping lift people out of poverty. Over 1/3 of the world's population have no access to electricity. In small groups ask pupils to write down all the things they use electricity for in a typical day. Show the video on the website then discuss if it 'brings to light' (apologies for the pun!) anything they hadn't thought of.

Explain that one of the United Nations 17 [Global Goals](#) (or Sustainable Development Goals, SDGs) focuses on access to affordable and clean energy, which confirms how important it is. For activities to help your pupils understand and engage with the Global Goals go to practicalaction.org/Global-Goals.

Find out what pupils already know about the different ways in which electricity is generated, especially renewable energy. You may like to show the renewable energy poster. Explain that when people don't have access to the national grid, e.g. in rural areas in countries like Nepal, other sources such as wind power are particularly important. Set the challenge and discuss the variables that will be involved in making design decisions, ie:

- Shape of the blades
- Size of blades
- Thickness of blades
- Number of blades
- How the shaft is attached to the desk

N.B Those that harness wind power to drive machinery, such as water pumps and windmills, need a higher torque and to be more stable. They generally have a higher number of larger blades.

Discuss how the design could be made as sustainable as possible, e.g.

- Reusing scrap material rather than new
- Reducing waste to a minimum (card, sellotape, string)
- Do they need to use a hairdryer?



You could introduce a prize for the most sustainable design as well as the one which lifts the most weight.

Ask your pupils to think about how they want to make it a 'fair' test. This could include

- Limiting the amount of materials (card, sellotape, string) that can be used for each group
- Ensuring all the hairdryers are of the same power rating
- Ensuring the hairdryer is a fixed distance away from the blades
- Allowing or not allowing students to touch the machine when it is operating

Discuss the design process. Pupils should be encouraged to research, design, build, test, evaluate then redesign.

Divide the class into groups of about 4 and give them a time limit to complete the challenge, 30 minutes should be sufficient.

When time is up ask each group to demonstrate their machine in turn and briefly describe the process they went through in reaching the final design. Pupils could present the process they went through to a wider audience using a method of their choice e.g. in the form of a poster or a short video.

This activity can be used to gain a CREST Award at Superstar, Discover, Bronze and Silver level. For more information on CREST awards go to crestawards.org

