



**Sustainable  
Composites**

A PARTNERSHIP BETWEEN THE NCC AND CPI

# Build a Wind Turbine Worksheet



# Your task – Work in a team to build the wind turbine which generates the most energy

Students can choose to change one variable of each wind turbine per team straight away or this can be a follow up activity.

## Materials needed:

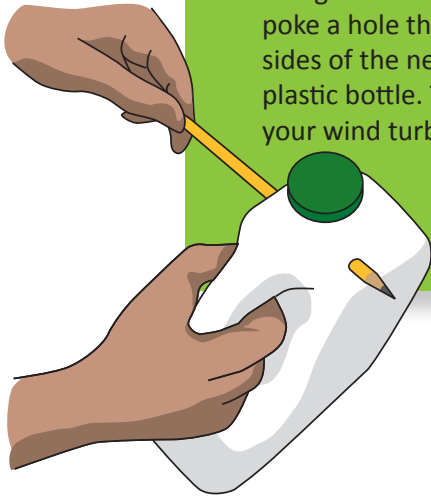


Alternative materials for the blades

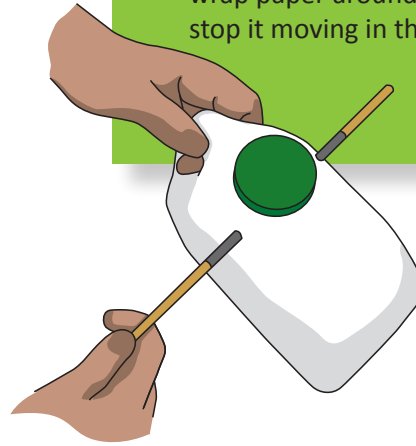
- Plastic
- Paper
- Cloth

## Method:

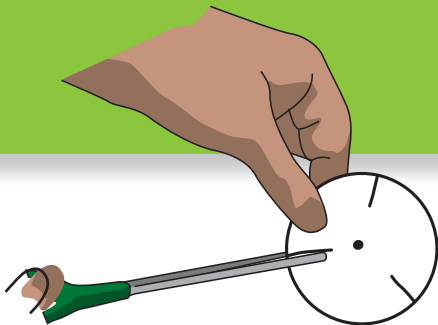
1. Using the sharp pencil, poke a hole through both sides of the neck of the plastic bottle. This will be your wind turbine tower



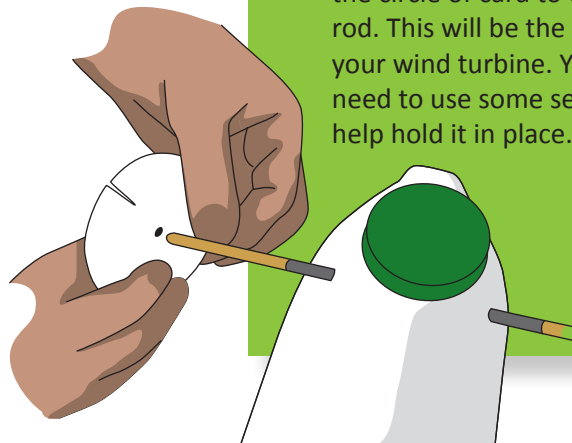
2. Push the wooden rod through the hole in the bottle (You may need to wrap paper around it to stop it moving in the hole).



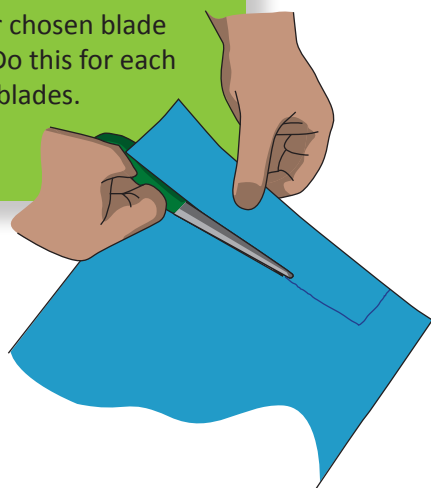
3. Take the thick card, cut a circle with a 6cm diameter. Mark the centre. Mark the edge of the circle with a straight line. Repeat this for each of the blades on your wind turbine. For a three-blade wind turbine, repeat this at 120° and again at 240°. You may need to use a protractor!



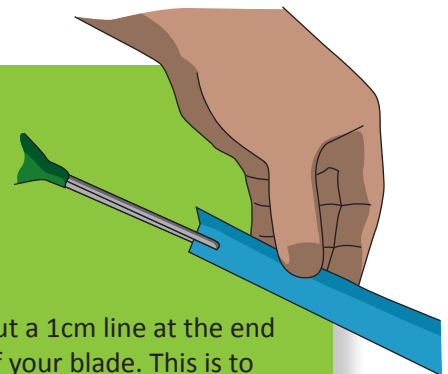
4. Using the pin, carefully attach the circle of card to the wooden rod. This will be the shaft of your wind turbine. You may need to use some sellotape to help hold it in place.



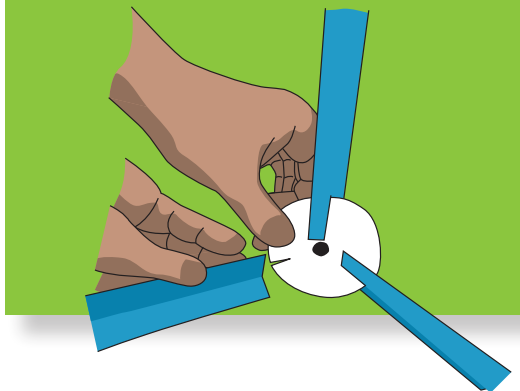
5. Take your chosen material. Draw and cut your chosen blade shape. Do this for each of your blades.



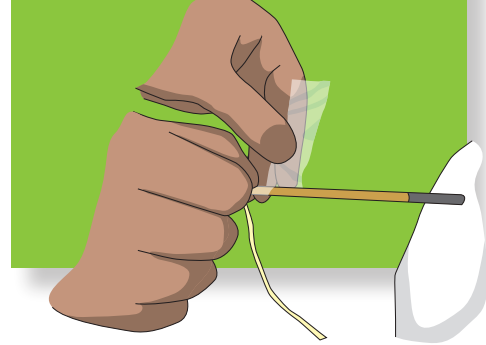
6. Cut a 1cm line at the end of your blade. This is to attach your blade to the wind turbine shaft.



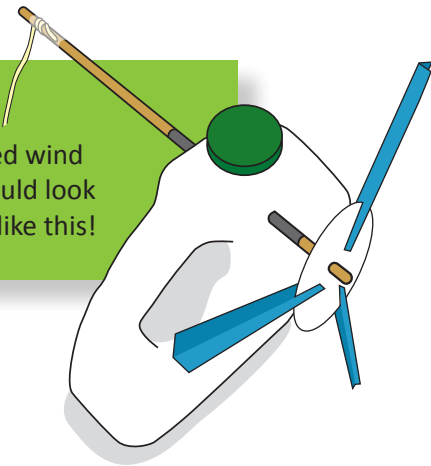
7. Slot all your blades into the shaft. You may need to use some sellotape to help hold it in place.



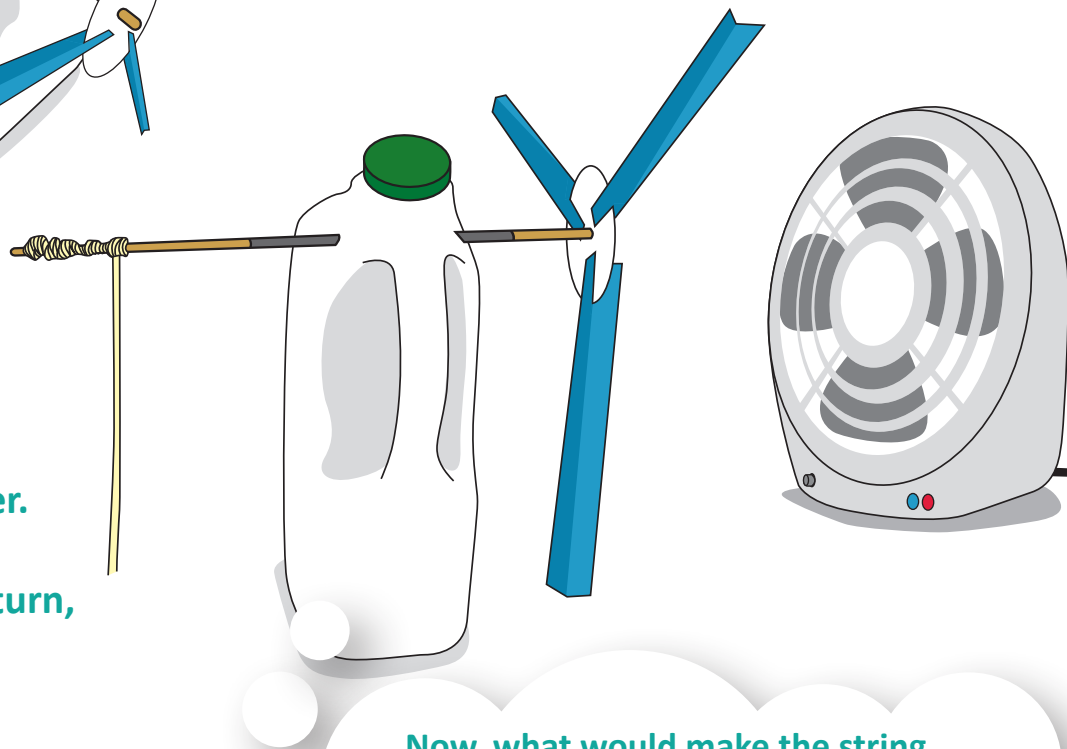
8. Measure a length of cotton or string (everyone should use the same length) and attach it to the end of the wooden rod with sellotape.



9. Your finished wind turbine should look something like this!




Test your wind turbine using a fan or hair dryer. The wind should make your blades and shaft turn, winding up the string.



Now, what would make the string wind up faster? Change one variable in each group. You could change:

- The length of the blade
- The material the blade is made from
- The number of blades

**Sustainable Composites** is a national initiative that is building a supply chain – from raw material suppliers to end-of-life recycling – with the ability to deliver the next generation of sustainable composites by 2040. Led by the National Composites Centre (NCC) and CPI – two of the seven High Value Manufacturing Catapult centres – it brings together industry, academia and government to accelerate the UK's progress to achieve net zero through the use of sustainable composite materials.

 [www.nccuk.com/sustainable-composites/](http://www.nccuk.com/sustainable-composites/)

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