



SUPER POWER: Power of water!

WATER TURBINE

BUILD TIME
20
MINS

LAB NOTES...

TO MAKE YOUR WIND TURBINE...



1. Watch the video of Nanogirl making her water turbine.
2. First, make some bearings similar to how you did in the Wind Racer activity. Measure and cut a piece of paper 16 cm long and as wide as your paper can go. Roll it around a skewer into a long straw, and tape it in place. Take the skewer out, and cut the straw in half. Set these aside for now.
3. Now, let's make the blades. Cut the top and bottom off your bottle, and cut a line down through the middle section. If you're using something like a milk bottle, cut the top, handle and bottom off, then cut down the middle. Open the plastic up into one long strip.
4. Measure and cut six 3 cm strips of plastic from the bottle.
5. Now, let's make the blade housing. Find something like a mug to draw around, which is about 10 cm across. Draw around it on the card twice, and cut out two circles.
6. Make a hole in the centre of each circle using your wooden skewer, into some blue tack if it's easier.
7. Draw a line across the middle of one circle, and divide each half into three sections, like pizza slices. Mark the edges of the circle where the ends of those sections would be in both halves, and then do the same on the other circle.
8. Line your two circles up so that you can see through the holes in the middle and the section marks line up on each side, and tape them together loosely, being careful not to put tape over your section marks.
9. At each section mark, make a small snip with your scissors, then another small one next to it, to make six small slots. Now you can cut the tape which holds your wheels together.
10. Cut two small circles of card, about the size of a bottle cap.
11. Assemble your turbine by threading your two small card circles onto your skewer and pushing them to the far end.
12. Thread one large card wheel onto the skewer, then the other one about 6 cm apart.
13. Slot one plastic blade into each slot on the wheel. If your plastic is curved, make sure that all the curves go the same direction.
14. Tape the blades to the wheels.
15. Take the bearings you made first of all, and slide one onto each end of the skewer.
16. Balance the skewer across the top of your bowl or sink, and bluetack the bearings onto the rim.
17. Cut a piece of string about as long as your arm, and tie one end to the skewer between the two small circles, which will be your spool guide. Secure it with a blob of blue tack.
18. Tie the loose end of the string to something you want to pull along. You could try your Wind Racer from earlier this week.
19. Fill your jug with water and pour it over the blades to turn the turbine.

ENERGY FROM WATER Before humans had electricity, we had to use the power of water to help us do things like lift heavy weights and move machinery. Water is essential for all life on earth, and throughout history, it's been an essential power that people have engineered machines to use. By building a wheel that can be pushed by running water like in a river, people learned that they could use the motion of the wheel turning to create power. We still use the power of water, rivers and waves today as a great source of renewable energy.

YOU WILL NEED

- Large bowl (or kitchen sink)..... ☐
- Jug of water (or tap) ☐
- Empty plastic bottle..... ☐
- Card e.g. cereal box card ☐
- Plain paper..... ☐
- A mug (to draw around) ☐
- 3 x wooden skewers ☐
- Blue tack ☐
- Marker pen ☐
- Tape..... ☐
- Scissors ☐
- Ruler..... ☐
- Paperclip ☐
- String..... ☐

Try attaching different weights to your string. What's the heaviest weight your turbine can move?

Do you think that your turbine would work better with bigger blades, or different shaped blades?

The force and weight of water hitting each of the blades in your water turbine pushes them down, which starts the wheel turning. Do you think that if you put your water turbine in running water like a river, that would have enough power to turn the wheels?