

Monster Sciences

MAKING SCIENCE FUN!

ENERGY

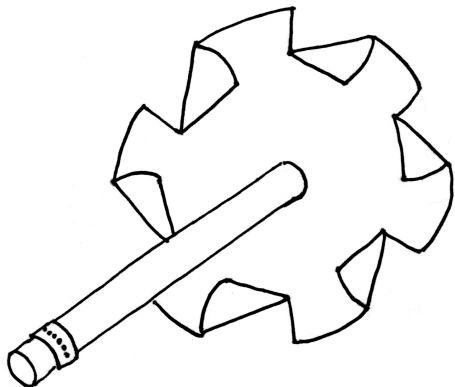
WATER ENERGY

What you will need:

- Small round paper plate
- Pencil
- Scissors
- Tap water
- Ruler

What you will do:

1. Draw a line from one edge of the plate to the other through the middle. **THIS WILL DIVIDE THE PLATE IN HALF.**
2. Now divide the plate in quarters by drawing a line perpendicular to the first line.
3. Draw 2 more lines diagonally between the first 2 lines. **WHEN YOU HAVE DONE YOU SHOULD HAVE DIVIDED YOUR CIRCLE INTO 8 CLOSE TO EQUAL PIECES JUST LIKE CUTTING UP A PIZZA.**



4. Push the pencil through the middle of the plate but then take it back out again.
5. Carefully cut along each line but **STOP HALFWAY** to the hole in the middle.
6. Fold the right half each cut down to form a triangle. **DON'T FOLD IT FLAT - IT NEEDS TO STICK OUT.**
7. Put the pencil back into the hole. **MAKE SURE IT CAN TURN EASILY IN THE HOLE.**
8. Hold the wheel under the water running from the tap. **WHAT HAPPENS?**

What should happen:

When the water hits the wheel the wheel should spin. The faster the water flows the faster the wheel should spin.

Monster Challenge:

- Find out when and how water wheels have been used to harness energy.
- Have a think about how this idea could be used to harness renewable energy into the future. Draw your ideas. (Hint where does water move?)



TEACHING NOTES:

Monster Sciences Experiment: Energy EN07

Key Concepts:

- Energy from moving water

Resources:

- Experiment description Energy EN07 - one copy per student.
- Investigation Report IR01 - one copy per student
- Small paper plates, pencils (round ones work best), scissors, ruler, access to running tap water

Lesson Notes:

As a class read through the procedure of this experiment and discuss how the students are going to work to complete the experiment. Demonstrate drawing the lines through the center of the plate - it is a difficult idea to explain but they will understand when you show them. You will also need to clearly demonstrate cutting only half way to the centre along each line - no matter what you say I have always had at least one student cut his plate in half!

Students should complete the sections of their Investigation Report IR01 from "Title to "Hypothesis".

At the conclusion of the lesson I bring the class back together to discuss their discoveries and to allow students to discuss any Monster Challenges they have completed.

What should happen in this experiment and why?

Students should be able to see their water wheels turning under the tap - if any don't spin check that the hole in the center is not too small for the pencil to fit loosely and that the blades on the wheel have not been folded to flat - they need to stick out to catch in the water.

Students should also be able to explain how the wheel is turning - the water has energy so it is moving, when the particles of water hit the wheel they transfer their energy to the wheel which makes it spin.

Follow up questions:

- Do you think you could reverse this process? What would happen if you were to spin the wheel in still water?
- Using what you have learnt in this experiment, can you explain how a boat propeller works?
- Can you think of a way of cutting the paper plate to make the wheel spin faster? Why don't you have a go at home?