

Hydro

Date:

Name:

Class:



Task 1 – The waterwheel challenge!

In your teams, design and make a working model of a water wheel

- Use as many or as few of the materials provided as you wish
- Choose the number and shape of your paddles
- Rig up a water source to test your design and see if you can control the speed!

Design your waterwheel in the space below

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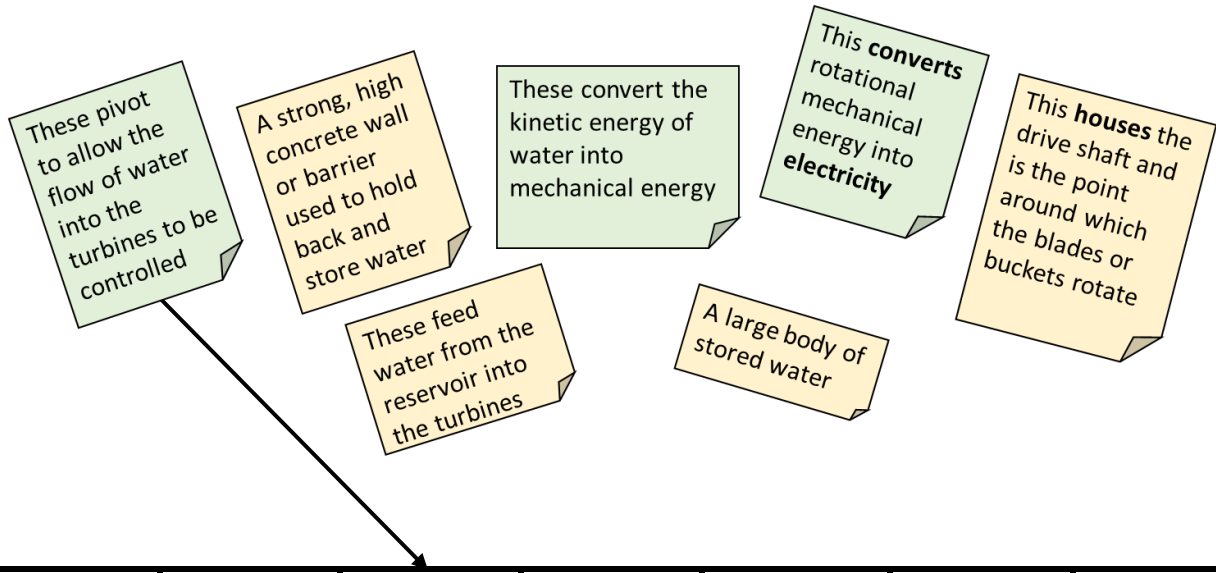
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Task 2 - Match the facts on the sticky notes with the appropriate named images below

The first one has been done as an example.



Dam	Reservoir	Wicket gate	Turbine	Penstock pipes	Turbine hub	Generator

Task 3 – Archimedes screw challenge!

In your teams make a **working model** of an **Archimedes screw** to move liquid or beads from a lower bowl to a higher one.

- Use as many or as few of the materials provided as you wish
- Be careful and **get assistance with cutting** where necessary
- You can use the instructions provided to create the spiral screw
- Rig up a support to test your design and see if you can measure the flow rate!

Materials and method are listed on the next page!

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You will be given:

- 1 x recycled plastic bottle (**your screw will fit inside this bottle!**)
- 1 x 10mm diameter wooden dowel (this needs to be just longer than your bottle)
- 1 x drawing pin and sticky tape and/or glue stick
- 1 x A3 sheet of strong recycled card
- 2 x bowls or deep dish
- Lentils or similar

Method:

1. Draw around your bottle and measure the **diameter** of that circle
 2. Subtract 8-10mm from that measurement. This new measurement is the diameter of the circles you are about to draw
 3. Draw six circles on your card, mark a 10mm hole (or whatever size your central pole - the dowel - is) in the middle of each one and draw a line from the edge of the outer circle to the edge of the inner one marking what will be the hole
 4. Cut the circles out, cut a slit in each circle along the line from the edge to the hole and then cut out the hole
 5. Using tape or glue, stick one side of the cut of one circle to the opposite side of the cut on the next circle
 6. Do this until all the circles are joined and form a spiral
 7. Carefully (getting help from an adult) cut the bottom off your bottle. At the other end, near the lid, cut a small square hole, about 20mm x 20mm
 8. Thread your dowel through the spiral and tape each end of the spiral to the dowel to hold it in place
 9. Insert the screw into your bottle and push the drawing pin through the lid and into one end of the dowel to hold it in place
 10. Fill one bowl with the lentils and set on a table. Set the second bowl or dish on some books so it is higher than the first
 11. Place the lid end of your bottle with hole in the bowl with the lentils and rest the bottle so the open end hangs over the empty bowl at the top
- Carefully turn the dowel at the top so the spiral turns

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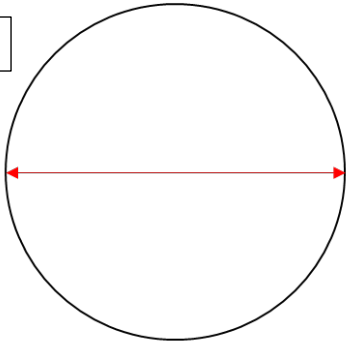
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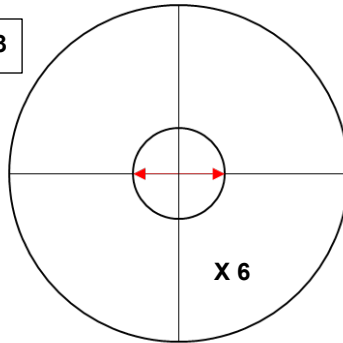


1-2



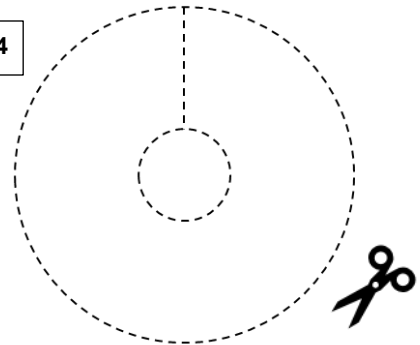
Diameter of each circle is the diameter of your bottle – 8/10mm

3



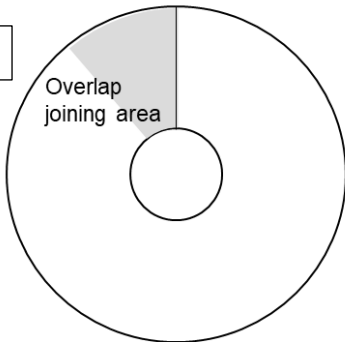
Mark a 10mm hole (or whatever size your central pole - the dowel - is) in the middle of each circle

4

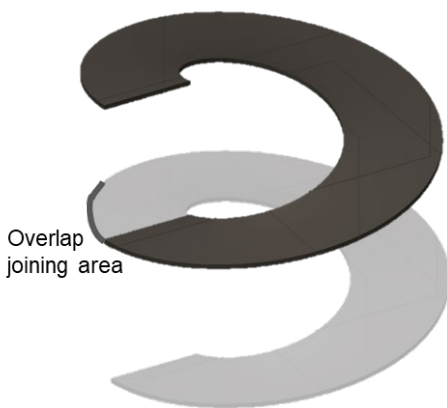


Cut the circles out, cut a slit in each circle along the line from the edge to the hole and then cut out the hole

5



5-6

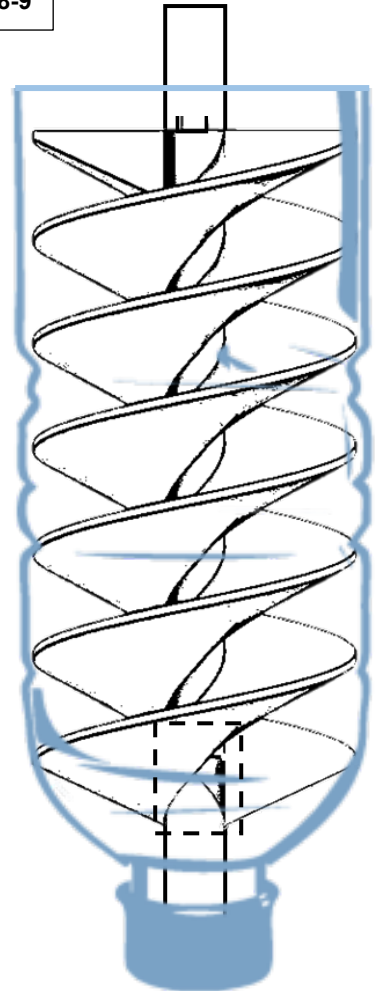


Using tape or glue, stick one side of the cut of one circle to the opposite side of the cut on the next circle

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Task 4 – Investigation

• It is your mission to find out the following information:

1. Where is Osney Lock Hydro located?
2. When was OLH constructed?
3. The power generated by OLH could provide electricity for how many homes?
4. How many kWh (kilowatt hours) of electricity did OLH generate during first 12 months of operation?



Any more important information to add to your investigation?