

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

Sketches and models will vary depending on the materials given, however all should feature the following:

- Cups, buckets, or paddles
- A central hub and spindle/shaft

All solutions should:

- Be able to rotate freely, turning the central shaft
- Rotate when water is poured onto the wheel

An elevated bottle with a small hole and spout at the bottom makes a good water source to test the wheels.

There are plenty of useful resource videos online:

https://www.youtube.com/watch?v=BZZrDace_h0

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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.

These pivot to allow the flow of water into the turbines to be controlled

A strong, high concrete wall or barrier used to hold back and store water

These convert the kinetic energy of water into mechanical energy

This converts rotational mechanical energy into electricity

This houses the drive shaft and is the point around which the blades or buckets rotate

These feed water from the reservoir into the turbines

A large body of stored water

Dam	Reservoir	Wicket gate	Turbine	Penstock pipes	Turbine hub	Generator
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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!

Full instructions are given on the worksheet. These videos show indicative outcomes: https://www.youtube.com/watch?v=AYxF1J0_DZM <https://www.youtube.com/watch?v=fHzWA9GLAkC>

This is also a useful resource if you are looking for an exemplar:

https://www.primaryict.co.uk/pr7972/primary-science-archimedes-screw-learning-lsp2836-uk?qclid=EAlalQobChMI_qDkreve6wIVitd3Ch3MoQ5iEAQYASABEgJBzPD_BwE

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Task 4 – Investigation

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

1. Where is Osney Lock Hydro located?

Set by the bank of the River Thames at
Osney Lock, Oxford

2. When was OLH constructed?

Building work started in the summer of 2013

3. The power generated by OLH could provide electricity for how many homes?

55 homes

4. How many kWh (kilowatt hours) of electricity did OLH generate during first 12 months of operation?

143,365 kWh

Any more important information to add to your investigation?

Further facts may include but are not limited to details about the planning of the project, construction, the reverse Archimedes screw, the fish pass, community engagement, funding environmental projects, carbon reduction, work with the Environment Agency etc

