



OSNEY LOCK HYDRO



Osney Lock Hydro Lesson 2



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This guide is designed to accompany and complement:

- Presentation: **Osney Lock Hydro**
- Single page lesson plan: **Osney Lock Hydro**
- Worksheet: **Osney Lock Hydro** (including activities and possible extension tasks or homework)

The guide goes into greater detail than the single page lesson plan and includes suggested resources and elaborates on each slide in the PowerPoint.

Presentation Tips:

- When opening the PDF presentation, you can select how it is displayed. If you wish to **click through** as opposed to scrolling (which gives you more control as you progress and is more like a conventional ppt) it is best to show it in **'full screen mode'** (press 'escape' to exit).
- All associated documents are attached to the presentation. To find these, click on the **paperclip icon** in the left-hand toolbar.
- When viewing the presentation, presenter notes from this delivery guide are also available for reference if you hover the cursor over the small orange callout icon in the top left corner. **Fig.1**

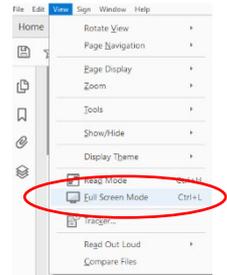


Fig.1



Fig.2



Fig.3

- If you **right click** on that icon it will open a small window showing presenter notes in the top right of the page. **Fig.2** If you right click and scroll down, you can also choose to click **'show comment app'** which opens a panel on the right of the page showing all the presenter notes as you scroll through. **Fig.3**

20 minutes to fill?

You could use slide 2 to elicit discussion about how place names have been shaped by their proximity to water. You may also like to refer back to points raised in the previous lesson 'Hydropower' about the role rivers and water sources played in establishing early settlements.

Slide 2

Slide number	This presentation is designed to allow the presenter/teacher to pitch it as appropriate to KS2 - KS3 age children. Questions that are on the slides have been differentiated by colour in this guide, with red being most challenging. 🏆 Those marked with this icon may not appear on the ppt slide and are optional, higher level questions. 🌀 Points marked with this icon can be used as a starting point for a personal investigation activity and for extension where appropriate. Advisory! All videos are linked to external players (usually YouTube) these have been chosen to complement and reinforce learning and have been chosen carefully. However, we would advise that you watch them yourself prior to showing them to ensure that you are happy that the content is right for your children or class.	Suggested resources	OLH resources
2	<p>Starter: Begin by discussing how rivers and waterways have played a part in the naming of towns, cities and settlements.</p> <ul style="list-style-type: none">• How many British towns or cities can you think of where their names have been influenced by the rivers that run through them? <p>Answers may include but are not limited to:</p> <p>Towns and cities containing the river name like –</p> <ul style="list-style-type: none">• Cambridge - River Cam• Exeter - River Exe• Plymouth - River Plym• Truro - River Truro• Inverness - River Ness• Kingston upon Hull - River Hull• Newcastle upon Tyne - River Tyne	Access to online map of UK	PPT presentation, worksheet and lesson plan

<p>2 Cont.</p>	<p>Names containing ‘ford’ like Oxford –</p> <ul style="list-style-type: none"> • Bradford • Hereford • Salford • Chelmsford <p>Names containing ‘mouth’ as in river mouth –</p> <ul style="list-style-type: none"> • Exmouth • Plymouth • Yarmouth • Portsmouth • <p>Names containing ‘burn’ or ‘bourne’ as in a stream or brook</p> <ul style="list-style-type: none"> • Blackburn • Kilburn • Winterbourne • Glyndebourne <p>Names ending in ‘ey’ or ‘ea’ from ‘eg’ (pronounced ee) which meant a raised piece of land surrounded by water or wetland</p> <ul style="list-style-type: none"> • Putney • Swansea • North Hinksey • The Isle of Sheppey 		
<p>3</p>	<p>Introducing Osney Island you may like to emphasise the unusual location as illustrated in the map and discuss with children – what makes an island?</p> <ul style="list-style-type: none"> • Just beyond the island is a weir and a facility that enables boats to progress safely downstream, what is this called? - A lock • 🏆 This may be a good point to refer back to the previous lesson ‘Hydropower’ and as children if they remember why locks used - Locks are designed to enable boats to navigate steep stretches of river safely. Locks act as gates that can be opened and closed to change the water level. 		<p>Lesson 1 Hydropower</p>

4	<p>It is interesting to note and emphasise that the waterways around Osney Island have a history of power generation.</p> <ul style="list-style-type: none"> • Why do you think this location on the river was chosen for the power station? – Access to coal deliveries (the river and canal were the best way of moving goods) easy access to water for cooling • In its first year of operation, the Osney Power Station supplied electricity to only 5 streetlamps and 11 business premises. Why do you think these numbers might have been so low? – There was very little existing infrastructure (no grid network) <p>🏆 Ask children if they can name a well-known power station on the tidal Thames in London – Battersea, Bankside power station (now the Tate Modern) Interestingly, from approx. 1930s - late 1970s there were 20 fossil-fuel burning power stations operating in London</p> <p>📖 It might be interesting to investigate what London would have been like during this era in terms of both air and water quality!</p>		
5	<p>The seed of Osney Lock Hydro was sewn in 2001. It is good to emphasise that, from the outset, this was a collaborative community project.</p> <ul style="list-style-type: none"> • How do you think local people felt about the idea of building a hydropower scheme in the heart of their community? – There was a 35% response rate to the survey and of those, 95% felt that a Hydro project at Osney Lock was a good idea and important action towards addressing climate change 		
6	<p>This is an opportunity to remind children about other sources of renewable energy.</p> <ul style="list-style-type: none"> • Why do you think hydro was chosen for this location over wind and solar? – Hydro was a clear choice for Osney island as they had the necessary resource - the riverside position • What features of the river at Osney make is a suitable site? - Importantly there is drop in river level at the lock/weir which means that water moves faster down the gradient 	<p>lessons looking at Wind and Solar are available at https://www.weset.org/ks-2/</p>	

Hand out Worksheet Hydropower

7	<p>Task 1 This slide can be used alone or in conjunction with the differentiated worksheet for recorded formative assessment</p> <ul style="list-style-type: none"> • Ask children to look at the 4 locations shown and defined and see if they can identify a suitable type of renewable energy for each one – answers will appear one by one on the click of the mouse <ol style="list-style-type: none"> 1. An open disused brown field site - solar array, solar photovoltaic panels 2. An open hillside away from houses - Wind farm, wind turbines 3. A weir next to a small town - hydro scheme, ‘run of river’ turbine 4. An area with natural hot springs - geothermal scheme, steam turbines 		Worksheet Osney Lock Hydro
8	<p>You can choose to show the video clip as it will only commence once you have clicked on the ‘play’ icon.</p> <p>The clip runs for [6m35s] and is an introduction the story of OLH by those involved.</p>	<p>https://www.youtube.com/watch?v=RN7alZ3IODD0&feature=emb_logo [6m35s]</p>	Embedded clip in ppt
9	<p>Hopefully, the image on this slide will prompt children to think about the definition of a ‘household’. On Osney island, households are not just those on land!</p> <p>The whole community were involved in consultation.</p> <ul style="list-style-type: none"> • What type of reassurances might local residents have wanted? – They may have had concerns about the disruption that construction may cause incl. noise, vehicles, impact to the environment and flooding etc. They may also have sought reassurance that the hydro would be able to generate enough power to make it viable/bring return on their investment in terms of access to renewable energy <p>🏆 What do you think it means to have a share in a company or project like OLH? – ‘Its shareholders are its members and control the Society, with each member having one vote regardless of the size of their shareholding’</p>		

10	<p>Osney Lock Hydro was a sizable construction project taking around 2 years to complete. An interesting article about this can be found using the attached link.</p> <ul style="list-style-type: none"> • Why do you think solar panels have been used in the powerhouse roof? – The solar panels boost energy generation (there is more on this in subsequent slides) 	https://www.dutchwatersector.com/news/final-construction-phase-for-community-owned-osney-lock-hydro-on-the-thames-uk	
11	<p>You can choose to show the video clip as it will only commence once you have clicked on the ‘play’ icon</p> <p>The clip runs for [0m56s]</p>	https://www.youtube.com/watch?v=Vb6d9iP_YlFs&feature=emb_logo [0m56s]	Embedded clip in ppt
12	<p>The solar array on the roof of the powerhouse boosts generation.</p> <p>‘The generating capacity of the project has been maximised by the inclusion of 7.75 kWp solar photovoltaic array panels on the roof of the building, generating an additional 6,665 kWh of green electricity annually’.</p> <ul style="list-style-type: none"> • Do PV solar panels need full sunshine to generate electricity? – No, modern solar panels need only daylight to generate electricity so will continue to generate on a cloudy day 		
13	<p>You can access live generation information using the attached link.</p> <p>Generation to date for 2020-21 financial year (updated 12 January 2021) - 119,890 kWh</p> <ul style="list-style-type: none"> • Why do you think hydro generation is very dependent on rain fall? – Rainfall affects river levels and ‘Run of River’ hydro, higher river levels mean a faster flow and so a faster rotating turbine and generator 	http://www.osneylockhydro.co.uk/shareholders/performance/	
14	<p>Task 2 This slide can be used alone or in conjunction with the differentiated worksheet where pupils can write their answers in the table provided for recorded formative assessment.</p> <ul style="list-style-type: none"> • Ask children to use the words in the list to fill in the gaps in the sentences – once you have gone through the task, the answers will appear one by one on the click of the mouse 		Worksheet Osney Lock Hydro

15	<p>It may be interesting to discuss that ‘investment’ in a project like OLH is not just a financial one.</p> <p>Community members also invest their time, that may be to help with maintenance, landscaping, guiding tours etc.</p> <ul style="list-style-type: none"> • Why do you think people are keen to volunteer to help in these ways? – Because this is something the community are proud of and wish to share as a positive example of a community renewable energy project. Many also benefit from the energy generated too 		
16	<p>As mentioned at the beginning of the video on slide 8, generating an income to invest in other environmental projects was a key intention from the outset.</p> <p>OLH is just one of a number of community initiatives in West Oxford with the shared aim of reducing the carbon footprint of West Oxford by 80% by 2050.</p> <p>Other groups include:</p> <p>Low Carbon West Oxford (LCWO) – a charity</p> <p>West Oxford Community Renewables (WOCORE)</p> <p>Hogacre Eco Park – a Community Interest Company</p> <ul style="list-style-type: none"> • How do you think this sustainable income stream might be generated? – Income is generated through: <ol style="list-style-type: none"> 1.Feed-in Tariff - This is paid for every unit of electricity generated (regardless of where it is used) for 20 years. It starts at 20.21p kWh and rises in line with the Retail Price Index. 2. Direct sale of electricity - The Environment Agency by electricity from us to power their yard at Osney. The price is pegged to that that they pay their supplier through their National Contract. We estimate that they will use around 80% of the electricity generated on site. 3. Exporting Electricity to the Grid - The remainder will be exported to the grid and sold. 		

17	<p>OLH have engaged learners of all ages through a whole range of events and activities.</p> <ul style="list-style-type: none"> • Why do you think education about renewable energy is so important? – Renewable energy is growing fast however, many people are still not aware of how various renewable energy sources work or, indeed the potential of renewable energy. When people understand a technology and the benefits of it, they are more likely to engage with it 		
18	<p>This has been a huge part of the OLH project and is reflected in a series of mosaics which have been commissioned in celebration of Osney’s centuries old relationship with the river (discussed in more depth on slide 21).</p> <p>Local artist Josie Webber has created designs featuring native species nominated by local residents and incorporating pottery fragments found in West Oxford.</p> <p>The marker stones will form part of a human sundial to be installed on the site. This project has been made possible thanks to the support of the National Lottery Heritage Fund.</p> <ul style="list-style-type: none"> • What types of wildlife can be attracted to the area by planting flowers and shrubs? – The aim is to encourage biodiversity, attracting insects and pollinators which in turn provide food for birds as well as various fish species 	<p>Taken from http://www.osneylockhydro.co.uk/sundial-spotlight-kingfisher/</p>	
19	<p>The Osney Lock Hydro project is not just a source of pride to the Osney island community but to the wider Oxford community.</p> <ul style="list-style-type: none"> • Why do you think he chose to make the video instead of travelling to Canada? – The Mayor wants to support carbon cutting initiatives and lead Oxford in its journey to net Zero, by choosing not to take a long haul flight and make a video instead, he was able to maintain a lower carbon footprint whilst still sharing the city’s achievements and works towards tackling climate change 	<p>You can watch his video here https://www.facebook.com/OxfordCityCouncil/videos/2448052988807986/</p>	

20	<p>Once again, getting members of a community involved and working together can relay a message with a greater impact than working alone.</p> <p><i>👉</i> It might be interesting to discuss how and why the river has always inspired artists, writers and poets etc. Children could research this further and present their findings</p> <ul style="list-style-type: none"> • Can you think of any communities near you that might be inspired to create a similar scheme? – Children may be able to identify opportunities for collaborations in their local communities, this may be to raise awareness of various issues 		
21	<p>It is valuable to discuss how we can harness our natural resources in a way that is good for people and good for the planet. We can choose to live in harmony with our environment!</p> <p><i>👉</i> Children might like to design and make their own wildlife ‘mosaic’ using recycled coloured papers for example, from magazines.</p>		
22	<p>Task 3 This slide can be used alone or in conjunction with the differentiated worksheet for recorded formative assessment.</p> <p><i>👉</i> The river has inspired poets and artists throughout history. Using the story of Osney Lock Hydro to inspire them, ask children to write a poem in celebration of the river and renewable hydropower</p> <p>You may like to scaffold this task further by asking children to write an ACROSTIC poem using the words HYDRO or RIVERLIFE</p> <p>Children should</p> <ul style="list-style-type: none"> • Think about descriptive language and choose their adjectives carefully • Think about the rhythm of the turbine as it rotates! • Present their poem with illustrations inspired by the river 	<p>https://www.poetry4kids.com/lessons/how-to-write-an-acrostic-poem/ https://www.youtube.com/watch?v=OMqB-3qpTao Useful video clip from T winkl</p>	Worksheet Osney Lock Hydro

23	<p>Plenary Quiz - What have you learnt?</p> <p>This can be done as a quick-fire hands up quiz or pupils can be given time to write down their own answers for formative assessment.</p> <ul style="list-style-type: none"> • What is the name of the river that (with its streams) borders Osney island? – The Thames • What building situated on the riverbank opposite Osney Island opened in 1892? – Osney Power Station, Oxford's first electrical power plant • In April 2013 residents were able to invest in the hydro by buying what? - Shares • What have been installed to increase the amount of green electricity generated at OLH? – Solar panels/solar array on the roof of the powerhouse • Why have volunteers planted a variety of shrubs and flowering plants in the area around the hydro? – To encourage biodiversity and enable wildlife to thrive in and around the riverside 		
24	<p>All images used are royalty free, 'Creative Commons' and free to use for non-commercial purposes</p> <p>Sources include: https://www.freeimages.com https://pixabay.com https://unsplash.com www.osneylockhydro.org.uk</p> <p>Microsoft online pictures search (Creative Commons only) Further information about self-guided and guided tours of Osney Lock Hydro is available at www.osneylockhydro.org.uk</p> <p>These materials are free to use and reproduce however we respectfully ask that you do not edit them</p> <p>Further resources can be found at: WeSET educational resources https://www.weset.org/ks-2/ WeSET virtual tour https://www.youtube.com/watch?v=af3oOd1LgyE Sandford hydro virtual tour https://www.youtube.com/watch?v=RvyLVKqnPml</p> <p>Osney Lock Hydro Limited is a registered society under the Co-operative & Community Benefit Societies Act 2014, registered in England and Wales, registration no. 31983R, VAT Registration no. 165 3322 22.</p>		