

# COMPREHENDING SCIENCE: PUMPED STORAGE HYDRO

The Comprehending Science series of resources uses extracts from Drax website articles that are relevant to the national curriculum, alongside comprehension questions. We've also made available a longer version of this resource, providing additional short answer questions and challenges.

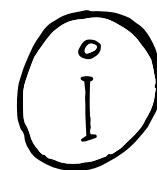
## TEACHER NOTES

<b>Most suited to</b>	KS3
<b>May be suitable for</b>	KS4
<b>Skills</b>	Comprehension, scientific literacy
<b>Subject</b>	Science, English language, geography, environmental issues
<b>Topic</b>	Electricity generation, sources of energy, electricity
<b>Suggested use</b>	Lesson activity, homework, remote provision, home learning
<b>Resources needed</b>	Optional internet access, paper or electronic copies of worksheet and questions
<b>Mark schemes guidance</b>	Suggested or model answers are provided

Feedback: <https://forms.office.com/r/VkQ6FF4xxJ>

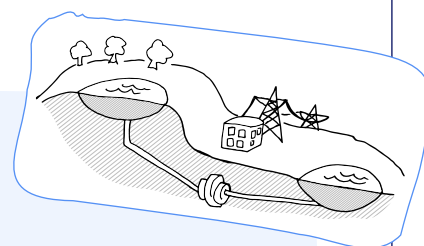
Contact us: [educational.resources@drax.com](mailto:educational.resources@drax.com)

# COMPREHENDING SCIENCE: PUMPED STORAGE HYDRO



- Read the text about this type of electricity generation, taken from: [www.drax.com/power-generation/what-is-pumped-storage-hydro](http://www.drax.com/power-generation/what-is-pumped-storage-hydro)
- Write the answers to the questions in your books/on paper, as instructed. Use full sentences. The numbers in brackets help you find the line numbers you need in the text.

## WHY IS PUMPED STORAGE HYDRO (PSH) IMPORTANT IN THE TRANSITION TO MORE RENEWABLE ENERGY?



- 2 To meet their climate goals, governments around the world are shifting  
4 from fossil fuels to renewable energy sources. But renewable generation  
6 technologies such as wind and solar pose challenges for power grid operators  
8 because they're weather-dependent and the supply of power is intermittent.
- 6 For example, wind farms accounted for almost a quarter of the UK's total  
8 electricity generation in 2020. However, on some days, wind met less than 10%  
10 of the country's electricity needs.
- 8 Changing weather patterns and extreme weather events with prolonged  
10 periods of little wind or reduced daylight are a further threat to grid stability.
- 10 When output from renewables falls, grid operators mostly turn to gas-fired  
12 power stations to plug the gap. But in the long term, relying on fossil fuels such  
14 as natural gas to balance the grid will compromise efforts to reach net zero  
16 emissions by 2050.
- 14 Pumped storage hydro facilities act as vast 'water batteries' and are a flexible,  
16 cost-effective way – at scale – of storing excess energy generated by renewables.

## IF YOU WANT TO UNDERSTAND MORE ON THIS TOPIC

- Watch a video explaining how our Cruachan pumped hydro works: <https://vimeo.com/566229360>
- Explore related articles at [www.drax.com](http://www.drax.com)

# COMPREHENDING SCIENCE: PUMPED STORAGE HYDRO QUESTIONS



1. What type of fuel use is being reduced? (1-2)
2. Is it easy for power grid operators to switch to using wind and solar? (2-4)
3. How much of the UK's total electricity in 2020 was generated by wind energy? (5-6)
4. What weather conditions are described as a threat to grid stability? (8-9)
5. What type of power station is currently relied upon to generate electricity when it's not windy? (10-11)
6. What type of power station is described as a way of storing excess generated energy? (13-14)

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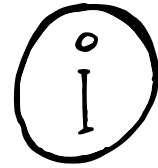
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Feedback:



# COMPREHENDING SCIENCE: PUMPED STORAGE HYDRO ANSWERS



1. Fossil fuel use is being reduced.
2. No, it's not easy – the article says there are 'challenges'.
3. Almost 25% (a quarter) of the UK's total electricity in 2020 was generated by wind energy.
4. 'Changing weather patterns and extreme weather events with prolonged periods of little wind or reduced daylight' are described as a threat to grid stability.
5. Gas-fired power stations are currently relied upon to generate electricity when it's not windy.
6. Pumped storage hydro power stations are described as a way to store excess generated energy.