River Landscapes: Flooding Management Lesson Plan and Teachers Notes

This GCSE / Key Stage 4 River Landscapes package is designed to support all major examination boards, including OCR, Edexcel, and AQA. However, some content included may not apply to every specification. **Teachers must ensure they follow the requirements of their own exam board's specification when delivering lessons.**

The lessons can be worked through at any pace, and can be split into multiple lessons if needed. This flexibility allows you to adjust the flow based on the class's understanding and time constraints. If some sections require more in-depth exploration, feel free to extend them over additional lessons to ensure students fully grasp the concepts before moving on.

The worksheets can be used in-class or as homework, depending on the pace of the lesson.

Lesson Objectives:

- Define soft and hard engineering and explain examples of these strategies and techniques
- Explain the advantages and disadvantages or each strategy and technique

Assumed Prior Knowledge:

Some soft and hard engineering techniques to manage flooding may have been covered at earlier stages, however at GCSE level, it is important that students can display a balanced argument regarding the positives and negatives of each technique, and have knowledge of a case study which can be used to evidence.

Resources:

- Worksheets
- To access the full River Management GCSE case study and accompanying worksheets, visit the dedicated page here: https://thefloodhub.co.uk/low-crosby-gcse-case-study/

Notes for each slide:

Teachers should decide what information students record into their workbooks.

Slide 1:

- Read through the learning objectives so students are aware of what they will be learning through this lesson.

Slide 2:

- As a recap exercise, ask students if they can identify which factors can increase or decrease flood risk.

Slide 3:

- This slide introduces the terms 'hard engineering' and 'soft engineering' and their definitions.

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Slide 4:

- Once students understand the meaning of hard and soft engineering techniques, ask them to identify which image shows which type of technique.

Slide 5:

- Talk through this slide with students. Hard engineering can be any man-made, artificial structure. Some examples are provided in bullet points with an example of a flood wall shown in the picture.

Slide 6:

- There are advantages and disadvantages to hard engineering. Talk through the text shown in boxes and ask students to identify the advantages and disadvantages. The boxes will change colour on click: red = disadvantage, green = advantage

Slides 7 - 10:

- These slides explain the hard engineering strategies: dams and reservoirs, straightening and dredging, embankments and flood walls, and flood relief channels. Each slide has a description, advantages and disadvantages and an example image.

Slide 11:

- Talk through this slide with students. Soft engineering involves using knowledge of river systems or natural and sustainable methods. Some examples are provided in bullet points with an example image of tree planting.

Slide 12:

- There are advantages and disadvantages to soft engineering. Talk through the text shown in boxes and ask students to identify the advantages and disadvantages. The boxes will change colour on click: red = disadvantage, green = advantage

Slides 13 - 17:

- These slides explain the soft engineering strategies: warning and informing, floodplain zoning, tree planting, river restoration and washlands. Each slide has a description, advantages and disadvantages and an example image.

Slide 18 - 19:

- These practice questions can be completed in class time or as homework, depending on the class ability. Question 4 is a high mark question where students should discuss both sides of the argument. The number of marks available can be adjusted in-line with the chosen examination board.

Slide 20:

- Once students have an understanding of river management, it is time to introduce a case study. Open the River Flood Management GCSE case study and work through the package.