LESSON 4: FLOODING

Aim

- To introduce the topic of floods and understand why they happen.

Lesson Objectives

- To understand what a flood is and how they are caused.
- To learn what factors can affect flood risk and whether these are natural or man-made factors.

Assumed Prior Knowledge

- The water cycle.
- Pupils will be able to identify different watercourses.
- A basic understanding of climate change.

Resources

- A video showing why floods happen – https://www.youtube.com/watch?v=Qe350nm_odA
- Optional water cycle experiment.
- Fill in the blanks water cycle worksheet.
- Slide with images and brief explanations of the factors influencing river and surface water flooding.
- Picture of a catchment showing various features including those which can cause flooding – pupils will be asked to identify these factors and split them into natural and man-made.

Assessment

- Correct labelling of water cycle diagram.
- Correct identification of factors influencing flooding.
    - Bonus marks for splitting these into man-made and natural.
- Homework task – To research a flood in the UK, what year, what caused it and the impacts.
- Ask the class to research the current years storm names and see whether their name is on there.

Lesson Outcomes

- To understand what a flood is and how they happen.
- To name at least three causes of flooding and briefly explain why.
- To be able to identify what factors can increase flood risk and briefly explain why.

Differentiation

- Visual – PowerPoints, worksheets.
- Audio – Class discussion, pair work and listening to the teacher.

Skills For Life

- Communication literacy – Speaking in pairs and as a group, writing about how the different factors could affect flooding.

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Curriculum Links

- Geography.
- Science.
- Literacy (Alphabet).

All the blank worksheets for this lesson can be found as a separate download within the 'Lesson 4' page of The Flood Hub KS2 learning section. The answers for the worksheets can be found at the end of this document.

Key words within the PowerPoint lesson are highlighted in orange and the definitions of these words can be found in the glossary, which is available to download off the homepage.

The optional worksheet and experiment for this lesson are:

- **A Met Office watercycle experiment.**
- **Worksheet: How do rivers flood?**

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Slide 1

- Once the teacher has run through the aims and objectives, the teacher should ask the class if they know what a flood is and ask them to discuss what a flood is in pairs for one minute. After one minute, the teacher will ask the pupils to feedback to the class what a flood is by raising their hand.

Slide 2 – What is a flood?

- Teacher to reveal to the class what a flood is.

Slide 3 – Flooding

- One by one, the teacher will reveal the image of a watercourse and ask pupils to raise their hand if they know the answer and if prompted, tell the class.
- Teacher to explain to the class that they can all flood.

Slide 4 – Why do floods happen?

- Short video clip showing why floods happen. This video is a brief overview and does NOT contain information on all types of flooding.

Slide 5 – Recap: The water cycle

- The water cycle slide can either be a recap or an introduction if this hasn't be taught before.
- Both the teacher and class will discuss the different steps in the water cycle. Pupils who would like to say what one step is should raise their hand, name the part and explain what happens at this point.
- There is an optional experiment that could be carried out either as a class, or the teacher can carry it out in front of the class for them to observe.
- Depending whether this slide is a recap or not and whether the teacher would like to go into more detail about the water cycle, the instructions can be found in appendix A.

Slide 6 – What can make flooding worse?

- The teacher should ask the class the reason why they think each heading makes flooding worse. This should be a class discussion.

Slide 7 – What can make flooding worse?

- Pupils to fill in the 'what makes flooding worse' worksheet, there can be bonus marks for the pupils if they write down whether they think each label is natural or man-made.

Slide 8 – Experiment time!

- Optional experiment – Appendix B contains the instructions for the experiment which can show the different influences on flooding.

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Slide 9 – Quiz

- Ask the pupils to do a quick show of hands to answer which area they think rains the most.

Slide 10 – Quiz

- Explain that there are more mountainous and hilly areas in the NW and W and use the next slides to explain why it rains more.

Slide 11 – Why does it rain more in the North and West?

- This slide explains why it rains more in the North and West of England.
- Run through the slide with the class using the diagram and ask them to copy this slide into their work books.

Slide 12 – Quiz

- This slide contains a quick, fun quiz for the pupils to complete as a class.
- The teacher will ask the pupils to raise their hand if they want to answer where a location is.

Slide 13 – Storms

- This slide is a quick introduction to storms and explains why they are named and who by.
- This task should be completed individually and pupils will come up with their own list of storm names in their book – this could be made into a poster as an extended exercise.

Slide 14 – Recap of lesson

- This slide is a quick recap of the lesson which can either be run through by the teacher or can be more interactive where the pupils finish the sentences.

Slide 15 – Homework

- This is a research homework. Research a flood in the UK and find out…
  - Where did it happen?
  - What year did it happen?
  - What caused it?
  - What were the impacts?
    - How many houses were flooded?
    - Did it cause other damage to the town/village?

- Optional additional homework: Find out what the work “flood” is in a different language (e.g. French, German or Spanish).

LESSON 4: FLOODING - EXPERIMENT

Teacher notes: Experiment to show the different influences on flooding (Lesson 1)

This is a guidance sheet containing instructions on a simple experiment which can demonstrate the different influences on flooding.

The teacher will need:

- Two plant pots filled with soil – one with plants in.
- Watering can/jug of water.
- Plastic cover, e.g. plastic wallet.
- A plastic board, e.g. a clipboard.

Aim:

- To understand what factors can increase flood risk.

Experiment objective:

- To understand why some areas may be more at risk of flooding than others.

Instructions:

- Pour water over the plant pot filled with soil (representing deforestation) and observe how long it takes for the water to infiltrate. Ask the pupils to state what they see.
- Pour the water over the plant pot containing plants (afforestation) and ask the pupils what they notice. They should notice that the plants intercept the water, with some water remaining on the leaves and that as a result, it takes longer for the water to reach the soil.
- Place the plastic sheet (e.g. plastic wallet) over the top of the plant pot which only contains soil, this represents impermeable ground/concrete. Pour the water over the top. The pupils should notice that the water runs straight off the plastic and none of it can enter the soil.
- Tilt a plastic board at a steep angle into the plant pot to represent a steep slope and pour water over it. Tilt the board at a shallower angle to represent a gentle, shallow slope and pour water over. Pupils should notice that water flows off the steeper slope into the plant pot quicker than the shallow one.
- Once the experiment is over, hand out the quiz sheet for the pupils to answer.

Outcomes:

The pupils should notice that:

- By having trees in a catchment (represented by the plant in the plant pot) the risk of flooding can be reduced as the trees intercept rainwater, slowing the time it takes for the water to reach the ground (soil).
- Water enters the soil much quicker without any trees in the catchment and therefore flood risk will increase as water will enter the channel quicker.
- Areas with lots of concreted areas (represented by the plastic sheeting) will have a higher risk of flooding as rainwater/runoff will not soak into the ground/soil and will flow straight into rivers instead.
- Finally, that water flows off the steeper slope into the plant pot quicker than the shallow one and therefore that steeper slopes can increase flood risk as water will enter the channel quicker.

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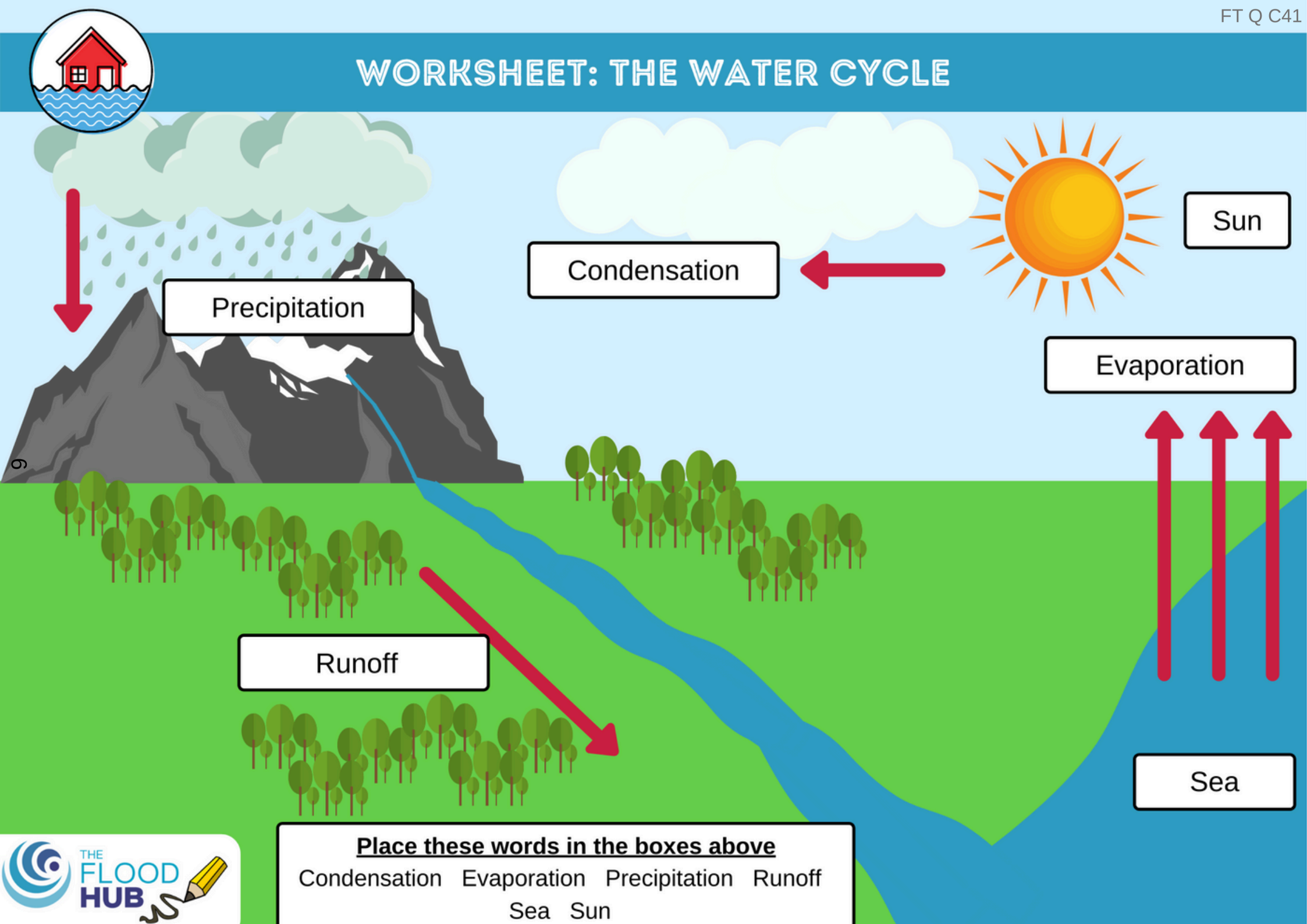
Quiz!

Tick the correct answers in the boxes below.

"Which of the following are likely to make water reach the ground or a river quicker?"

Steep slopes	☑	Shallow slopes	☐
Areas with lots of trees	☐	Deforestation	☑
Areas with lots of concrete	☑	Areas with lots of grass/greenery	☐

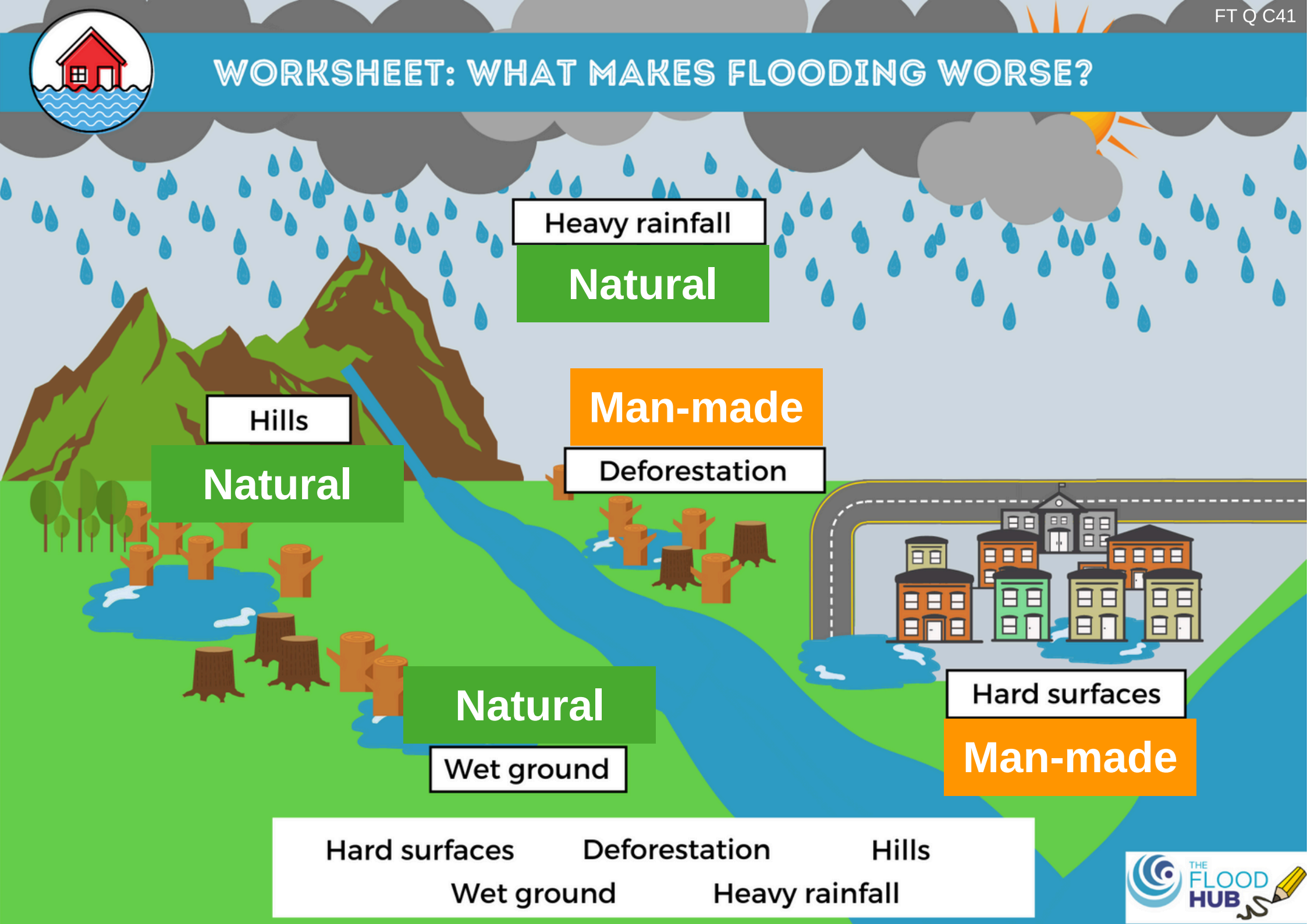
WORKSHEET: THE WATER CYCLE



Place these words in the boxes above

Condensation Evaporation Precipitation Runoff Sea Sun

WORKSHEET: WHAT MAKES FLOODING WORSE?



Hard surfaces Deforestation Hills

Wet ground Heavy rainfall

THE FLOOD HUB

WATERCYCLE EXPERIMENT

Make your own watercycle in a bowl!

You will need:

- A large bowl
- A small yogurt pot or plastic cup
- Clingfilm
- Water
- Small weight or a few coins
- Sunny window sill

What to do:

- Take the large bowl and fill it with several centimetres of water.
- Place your small pot in the centre of the bowl of water, making sure not to get any water inside it.
- Cover the large bowl with clingfilm and fasten this down securely to the side of the bowl.
- Put a weight on top of the clingfilm, over the centre of the small pot to push the clingfilm down into it slightly.
- Place your experiment on a warm sunny window sill and leave for a few days.
- You should find that the heat of the sun evaporates the water, which rises, condenses on the cool plastic, and falls into the small container. This is a small version of what happens in the real water cycle.

Experiment from the Met Office

WORKSHEET: HOW DO RIVERS FLOOD?

Fill in the blanks to explain how a river can flood

When heavy **RAIN** falls from the clouds as precipitation it lands on the ground, some **SOAKS** into the ground and the rest runs off to the nearest **WATERCOURSE**.

If there are lots of **ROADS** and **HOUSES** on the land, rain runs off the land quickly and increases the height of **RIVERS.** When rivers get too full they cause **FLOODING**.

Other extreme weather like **STORMS** can cause flooding in coastal areas when strong winds make large **WAVES** crash against the coastline.

roads	**rain**	**soaks**
storms	**rivers**	**waves**
flooding	**watercourse**	**houses**

THE FLOOD HUB