LESSON 3: A RIVER FROM SOURCE TO SEA

Aim

- To understand how rivers and the surrounding land changes from source to sea.

Lesson Objectives

- To learn the processes that shape the land and create landforms.
- To learn how the land changes from source to sea.
- To learn the different river landforms.
- To understand what affects the flow of a river.

Assumed Prior Knowledge

- Understand what a stream is.
- Know that rivers get bigger and wider further downstream.
- Know that land is flat at the sea.

Resources

- A video of a river from source to sea - https://www.bbc.co.uk/bitesize/topics/z849q6f/articles/z7w8pg8
- BBC Bitesize video about V-Shaped Valleys - https://www.bbc.co.uk/bitesize/guides/zyt9q6f/revision/4
- BBC Bitesize video about waterfalls - https://www.bbc.co.uk/bitesize/guides/zyt9q6f/revision/4
- Video about meanders - https://www.britannica.com/video/185625/meanders-formation-rivers-streams-disturbances-disturbance-stream
- Upper, middle and lower course card game.
- Worksheet: Factors affecting the flow of a river.
- Worksheet: Ordnance Survey map reading.
- Homework – River landforms.

  Optional/Extra Worksheets:
- Changes along a rivers course - fill in the blanks.
- River landforms word search.
- Landscape and channel changes across the River Stour - involves using Google Earth and can be an in class exercise or homework task.

Assessment

- Card game.
- Ordinance Survey map reading exercise.
- Homework:
  - Find a picture on Google Earth of one of the river landforms we have discussed today on your local river.
  - River landforms match up worksheet.

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Lesson Outcomes

- To learn what weathering, erosion and deposition are.
- To understand that the source of a river starts up in higher, upland areas and that the mouth is where a river meets the sea or a lake and the land is flat.
- To know that a river can be split into three sections: the upper, middle and lower course.
- To be able to name different river landforms and say whether these are in the upper, middle or lower course of a river.
- To name at least three factors which can affect the flow of a river.

Differentiation

- Class discussion.
- Group work.
- Individual work.

Skills For Life

- Communication.

Curriculum Links

- Art.
- Geography and map reading.
- I.T.

All the blank worksheets for this lesson can be found as a separate download within the 'Lesson 3' page of the 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 extra worksheet tasks for this lesson are:

- **Changes along a rivers course - fill in the blanks**
- **River landforms word search**
- **Landscape and channel changes along the River Stour - this task can only be carried out using Google Earth and can be a in class exercise or homework task. Depending on the age of the pupils, they could be asked to write the answers in bullet points or sentences.**

LESSON 3: A RIVER FROM SOURCE TO SEA

This lesson is mainly led by the teacher and involves the pupils listening and making notes when instructed by the teacher, as opposed to lots of class exercises.

Slide 1

- Slide containing the lesson aims and objectives.

Slide 2 Source to mouth

- The diagram shows the source and mouth of a river. Optional video showing the route of a river from source to sea: https://www.bbc.co.uk/bitesize/topics/z849q6f/articles/z7w8pg8

Slide 3 – Why do rivers change over time?

- Run through the following definitions with the pupils and ask them to copy down the definitions in their work books.

Slide 4 – A natural river

- The pupils could draw and label the river channel in their workbooks.

Slide 5 – A straightened river

- The pupils could draw and label the river channel in their workbooks. At the end, there could be a class discussion about the differences between the two images.

Slide 6 – Changes in the land around a river and the channel

- Teacher to talk through the slide with the class. The pupils could draw and write the table in their workbooks.

Upper Course	Middle Course	Lower Course
• The river begins in upland areas (hills and mountains) - the source • Steep slopes • Narrow valley sides • A narrow, shallow river channel with a rocky bed	• Gentler slopes • Wider and deeper channel	• Ends where a river meets a lake or the sea (mouth) • Low lying flat land • Gentle, wide valley sides • Wide channel and where the flow is at its fastest

Slide 7 – River landforms

- Teacher to point out the various different landforms which can be found in the upper, middle and lower courses on the diagram.
- The teacher could take the opportunity to point out the differences in the surrounding landscape and river channel, i.e. narrow river channel in the upper course with steeper valley sides.

(Slides 8 – 14: Teacher to run through with the class and decide if the information is to be copied down.)

Slide 8 – River landforms: V-shaped valley

- The link on the following slide shows a BBC Bitesize video on how V-Shaped valleys and waterfalls are formed: https://www.bbc.co.uk/bitesize/guides/zyt9q6f/revision/4. This can help the pupils understand.

Slide 9 – River landforms: Waterfall

- Video is a link to how waterfalls form in the upper course - https://www.bbc.co.uk/bitesize/guides/zyt9q6f/revision/4

Slide 10 – River landforms: Meander

- Depending on the age group, teacher could mention that a river is faster on the outside of the river bend, which causes erosion and slower on the inside, leading to deposition. This creates the meander bend in the channel.
- Optional video: https://www.britannica.com/video/185625/meanders-formation-rivers-streams-disturbances-disturbance-stream

Slide 11 – River landforms: Oxbow Lake

- There is an optional video which can show how they are formed. This video has some technical language that does not need to be known. It mentions “alluvium”: https://www.bbc.co.uk/bitesize/guides/z6jx382/revision/4
  - **Alluvium =** material such as sand, silt and clay left behind by a river.

Slides 12 and 13 – River landforms: Floodplain and levee

- Teacher to run through the slides.

Slide 14 – River landforms: Estuary

- There is an optional research task which the pupils can carry out at this point:
  - Research an estuary which is in the UK and note down:
    - Where it is and what county it is in;
    - How long it is;
    - Which river the estuary forms from, and;
    - Which sea or lake that the river flows into.

Slide 15 – Recap

- The labels are revealed from top to bottom.
- *Optional* On A3 paper, ask the pupils to draw and label their own version of the diagram shown in the slide. Ensure it shows all 3 courses, the various landforms and the changes in the land and the channel.

Slide 16 – Worksheet: Card game

- The pupils need to match the small cards containing words associated with rivers, landforms and shape of land, to the course of the river that they are found in.
- Some cards are the same because they are found in more than one course of a river.
- The sheet can be printed out for pupils to cut up and stick in their books, or copied down from the slide.
- This can be marked together as a class, asking the pupils to put their hand up and say which course they think each card belongs to.

Slides 17 and 18 – What affects the flow of a river? Man-made and natural effects

- Have a quick discussion as a class as to why the pupils think these factors may have an effect. Ask the children to raise their hand to answer as opposed to shouting out. The answers will be revealed one by one (left to right).

Slide 19 – Worksheet: What affects the flow of a river?

- Either go through the answers on the slide with the pupils or print out the worksheet for the pupils to fill in and stick in their work books when they have the correct answers.
- Answers will appear on the slide.

Slides 20 – Worksheet: Map reading

- The pupils should complete the map reading exercise by putting the coordinates of the river landforms and places listed on the worksheet in the gaps provided.
- **Answers:**
  - Meanders: (A,4) (B,3) (B,2) (C,2)
  - Oxbow lakes: (D,1)
  - School: (A,2)
  - Place of worship: (A,1)
  - Picnic site: (E,2)
  - Car park: (B,1)
  - Golf course: (A,3)
- After this has been completed, mark it altogether as a class and it can be stuck in to their workbooks.

Slide 21 – Recap of lesson

- This slide is a quick recap of the whole lesson.

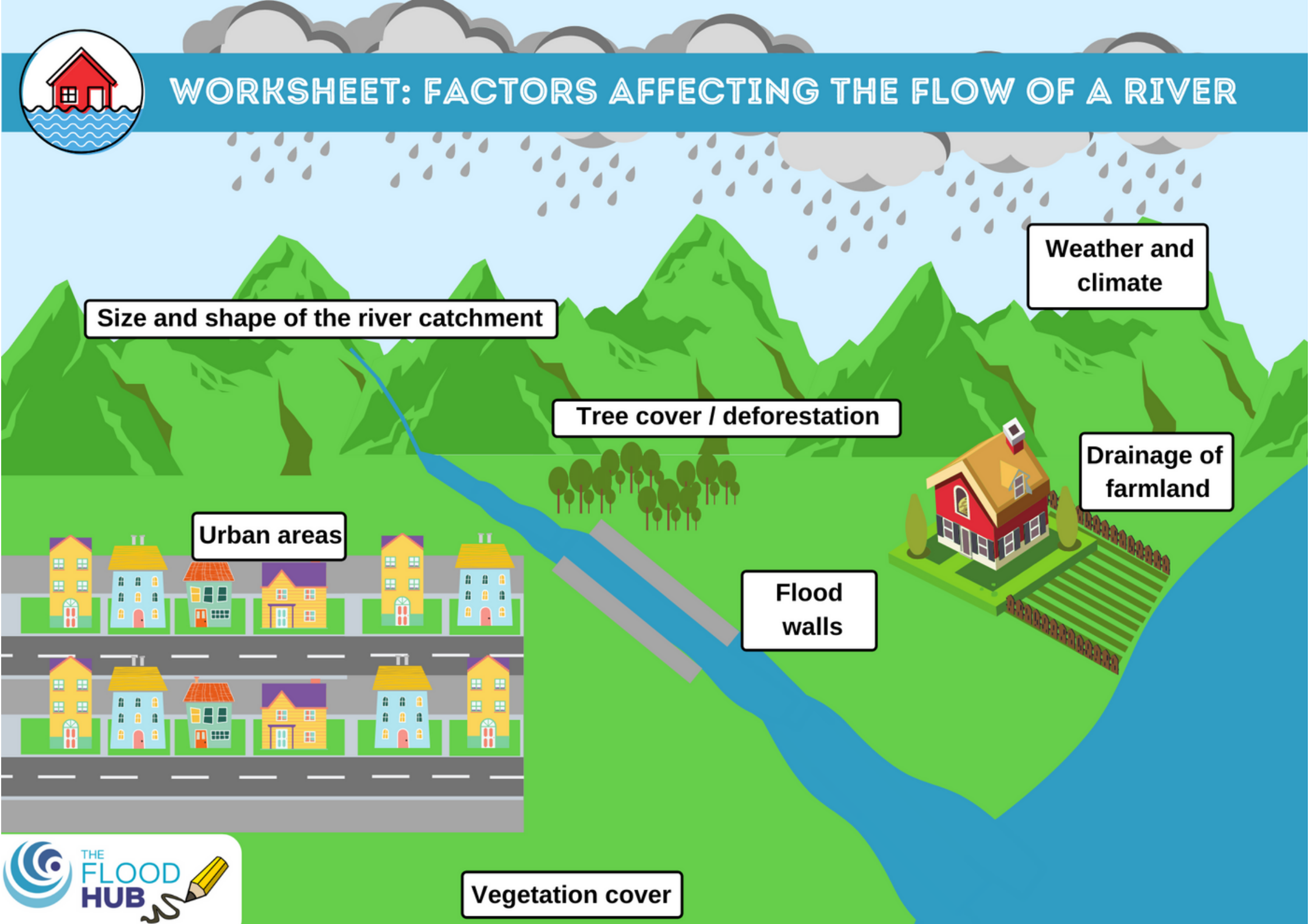
Slide 22 – Homework: River landforms

- Print off the river landforms worksheet for pupils to complete for homework.
- *Optional* The pupils could be asked to find a picture on Google Earth of one of the river landforms that they have learnt about in class on their local river.

WORKSHEET: CARD GAME

Source	High land	Steep slopes	Narrow valley sides	Narrow and shallow river channel with a rocky bed
V-Shaped valleys	Waterfalls	Gentler slopes	Wider, deeper channel	Faster flow
Meanders	Meanders	Oxbow lake	Floodplain	Floodplain
Oxbow lake	Low lying, flat land	Wide valley sides	Wide river channel	Fastest flow
Estuary	Levees	Mouth		
UPPER COURSE				
MIDDLE COURSE				
LOWER COURSE				

WORKSHEET: FACTORS AFFECTING THE FLOW OF A RIVER



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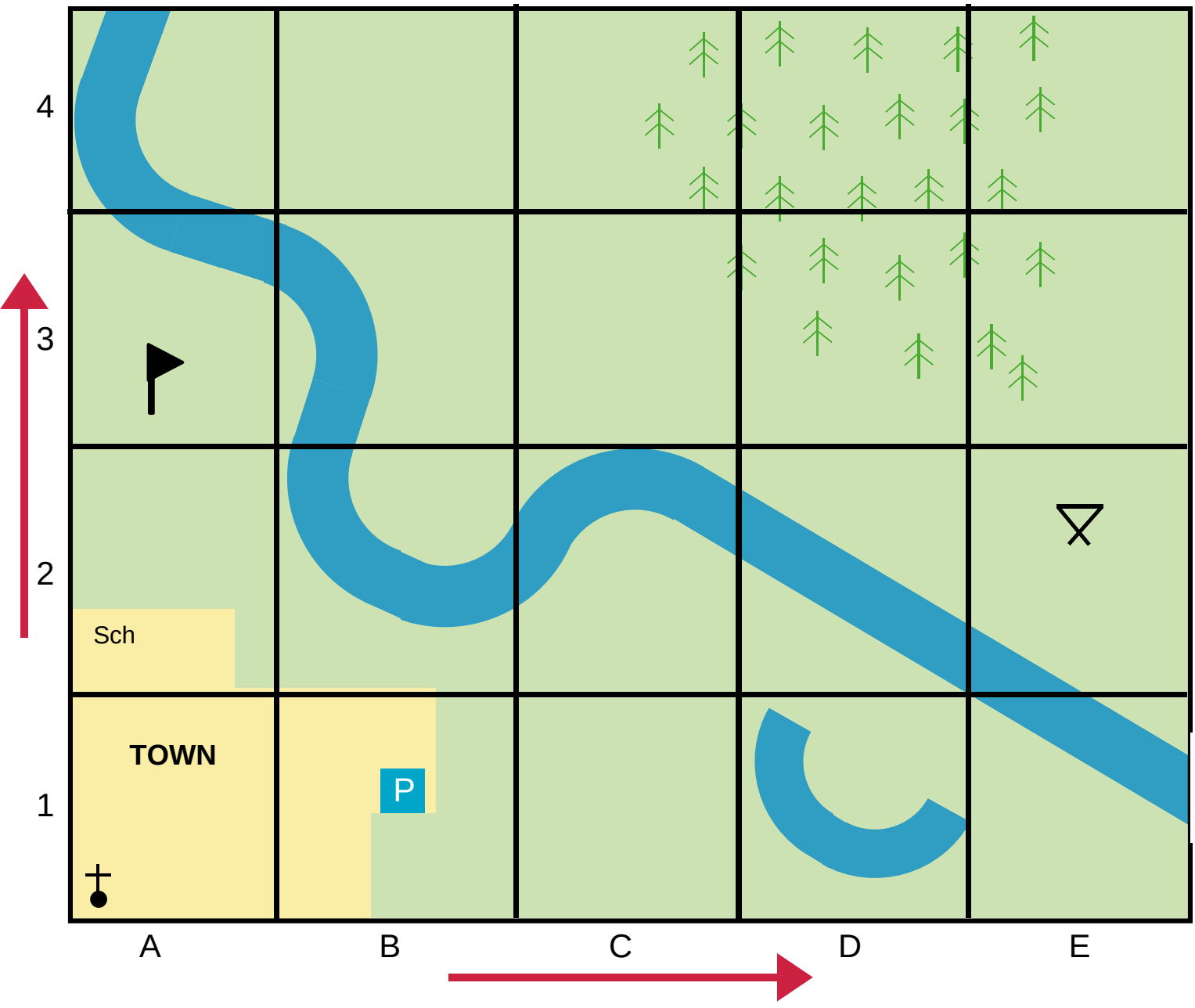
WORKSHEET: MAP READING



Write down the coordinates for the following:

Meanders:	(A,4) (B,3) (B,2) (C,2)
Oxbow lake:	(D,1)
School:	(A,2)
Place of worship:	(A,1)
Picnic site:	(E,2)
Car park:	(B,1)
Golf course:	(A,3)

Key

- P — Car park
- Place of worship
- Golf course
- Picnic site
- Sch — School

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HOMEWORK: RIVER LANDFORMS

Correctly match up the river landform with it's description and where in the river's course it can be found. A landform can link to more than one course.

Upper Course

Middle Course

Lower Course

Meander

Estuary

V-Shaped Valley

Floodplain

Waterfall

Oxbow lake

Created when a river erodes both vertically and horizontally.

A steep drop in the course of a river. They form when water flows over hard rock that overlies softer rock.

A bend in the river channel created by the speed of the water, erosion and deposition.

The point where a river meets the sea.

A curved lake, created when the gap between a meander bend gets smaller.

The flat land next to a river where water flows onto when a river overtops during a flood.

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WORKSHEET: CHANGES ALONG A RIVER'S COURSE

Fill in the blanks to explain how the land, the river channel and landforms change along a river's course.

The start of a river is called the source and this is in the upper course of the river. Here the channel is narrow and shallow with a rocky bed. The land is high and steep. Here, the following landforms can be found: v-shaped valleys and waterfalls.

In the middle course of the river, the channel is wider and deeper than the upper course and the land is gently sloping. In this part of the river, there are the following landforms: meanders, oxbow lakes and floodplains.

In the lower course of the river, the land is low-lying and flat with wide valleys. Here the channel is at it's widest and the flow is at it's fastest, and ends at the river's mouth. Here there are the following landforms: meanders, oxbow lakes, floodplains, levees and deltas.

Deeper	Lower	Oxbow lakes	Waterfalls
Deltas	Meanders	Rocky	Wide
Fastest	Meanders	Shallow	Wider
Flat	Middle	Source	Widest
Floodplains	Mouth	Steep	
Floodplains	Narrow	Upper	
High	Oxbow lakes	V-Shaped valleys	

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WORKSHEET: RIVER LANDFORMS WORD SEARCH

Answers in bold

R	**I**	**V**	**E**	**R**	A	R	**D**	**E**	**L**	**T**	**A**	X	**O**
V	T	H	X	D	P	**M**	A	D	N	O	S	**W**	**X**
U	**S**	**C**	B	M	**S**	**O**	**U**	**R**	**C**	**E**	V	**E**	**B**
E	W	**H**	Q	R	O	**U**	A	Y	M	**W**	X	**A**	**O**
J	G	**A**	**A**	E	H	**T**	N	B	F	**A**	B	**T**	**W**
R	S	**N**	R	**P**	F	**H**	**N**	N	P	**T**	R	**H**	**L**
E	J	**N**	E	A	**E**	**O**	**L**	Q	I	**E**	G	**E**	**A**
D	H	**E**	D	W	**I**	**D**	**E**	A	R	**R**	F	**R**	**K**
N	R	**L**	T	**S**	G	B	**V**	S	A	**F**	L	**I**	**E**
A	F	F	**O**	U	B	R	**E**	**A**	V	**A**	D	**N**	M
E	V	**R**	U	T	Q	P	**E**	S	**L**	**L**	K	**G**	A
M	**E**	D	M	Q	I	E	D	C	A	**L**	N	P	E
S	B	U	**N**	**O**	**I**	**T**	**I**	**S**	**O**	**P**	**E**	**D**	H
F	**L**	**O**	**O**	**D**	**P**	**L**	**A**	**I**	**N**	X	O	**Y**	R

Channel
Delta
Deposition
Erosion
Floodplain
Levee
Meander
Mouth
Oxbow Lake
River
Source
V-Shaped Valley
Waterfall
Weathering

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WORKSHEET: LANDSCAPE AND CHANNEL CHANGES ALONG THE RIVER STOUR

Using Google Earth, we are going to look at how the landscape and river channel changes along the River Stour (Dorset).

Type in the following locations:

- Hinton St Mary, Sturminster Newton
- Christchurch

Thinking back to what you learnt in the lesson, your task is to write down what you notice about the size of the river channel (e.g. wide or narrow), the surrounding land (is the land flatter in one location than the other?), what things may affect the flow of the river and any river landforms you see in these two locations.

Once you have done this, circle whether you think that location is in the upper or lower course of the River Stour.

Hinton St Mary, Sturminster Newton (Upper course or lower course)

The pupils should notice that the channel is **narrow** and there are lots of **tributaries**. There is a **lot of grass and vegetation** which could **slow down and decrease** the flow of the river**.** There are also farms in the area which could **increase** flow.

Christchurch (Upper course or lower course)

The pupils should notice that the channel is wider and there are lots of **meanders**. There is a **some grass, vegetation and trees** but there are mainly **urban areas around the river** which could **increase** flow**.** The surrounding land is also **flatter.**

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