



Middle Course - Landforms

Learning Objective:

- **Examine** the *formation* of landforms

A scenic view of a river flowing through a rocky gorge. In the background, a waterfall cascades over a series of rock ledges. The foreground shows large, dark, mossy rocks in the water. The sky is overcast and grey. The text is overlaid on a semi-transparent white box.

Learning Outcomes:

- **Compare** features of the upper and middle course of a river
- **Explain** how meanders form
- **Suggest** what might happen to a meander over time

High Force Waterfall – River Tees



1.

Hard rock
layer

6.

Gorge side

2.

Soft rock
layer,
shale.

3.

Plunge pool

4.

Undercutting

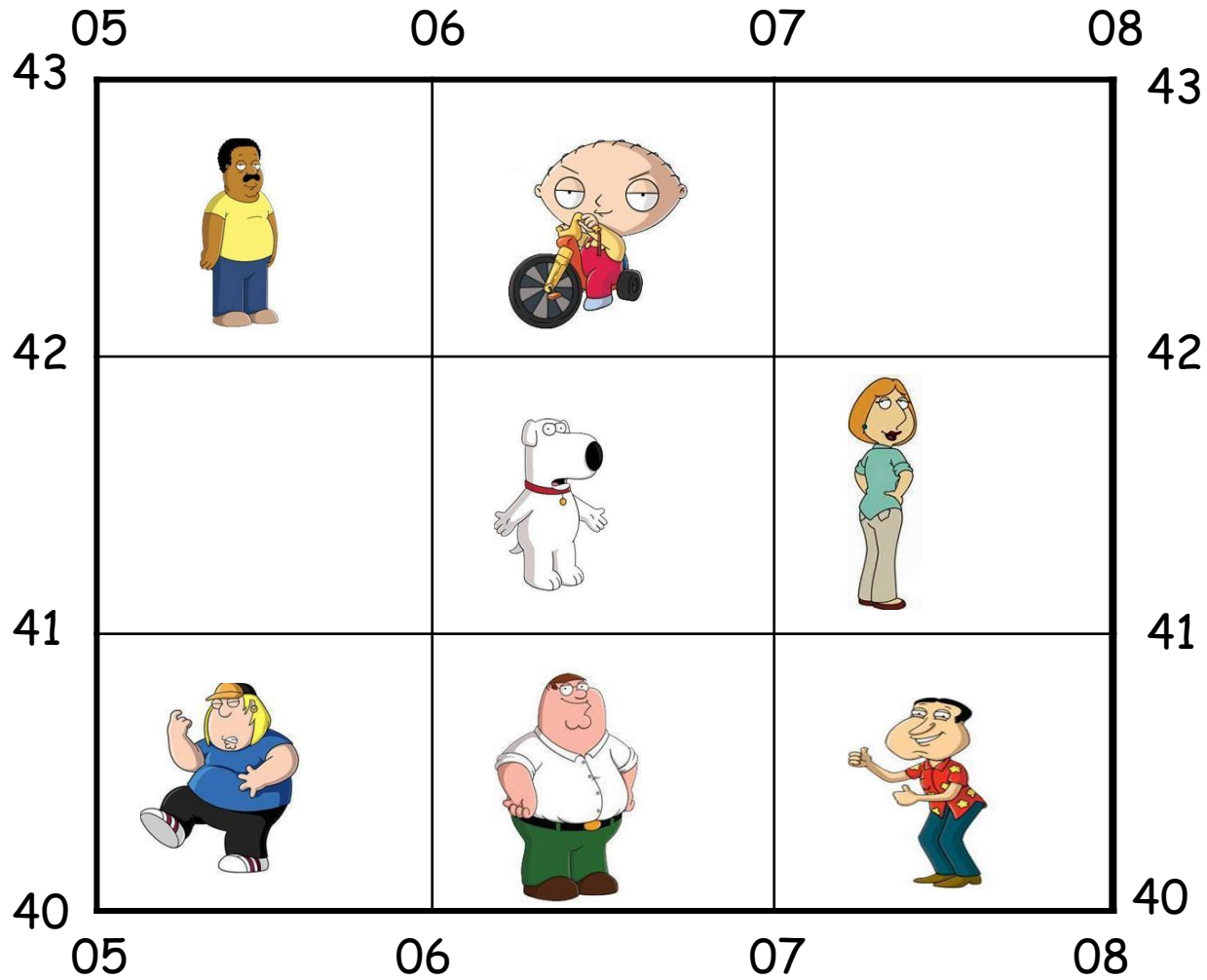
5.

Fallen hard rock

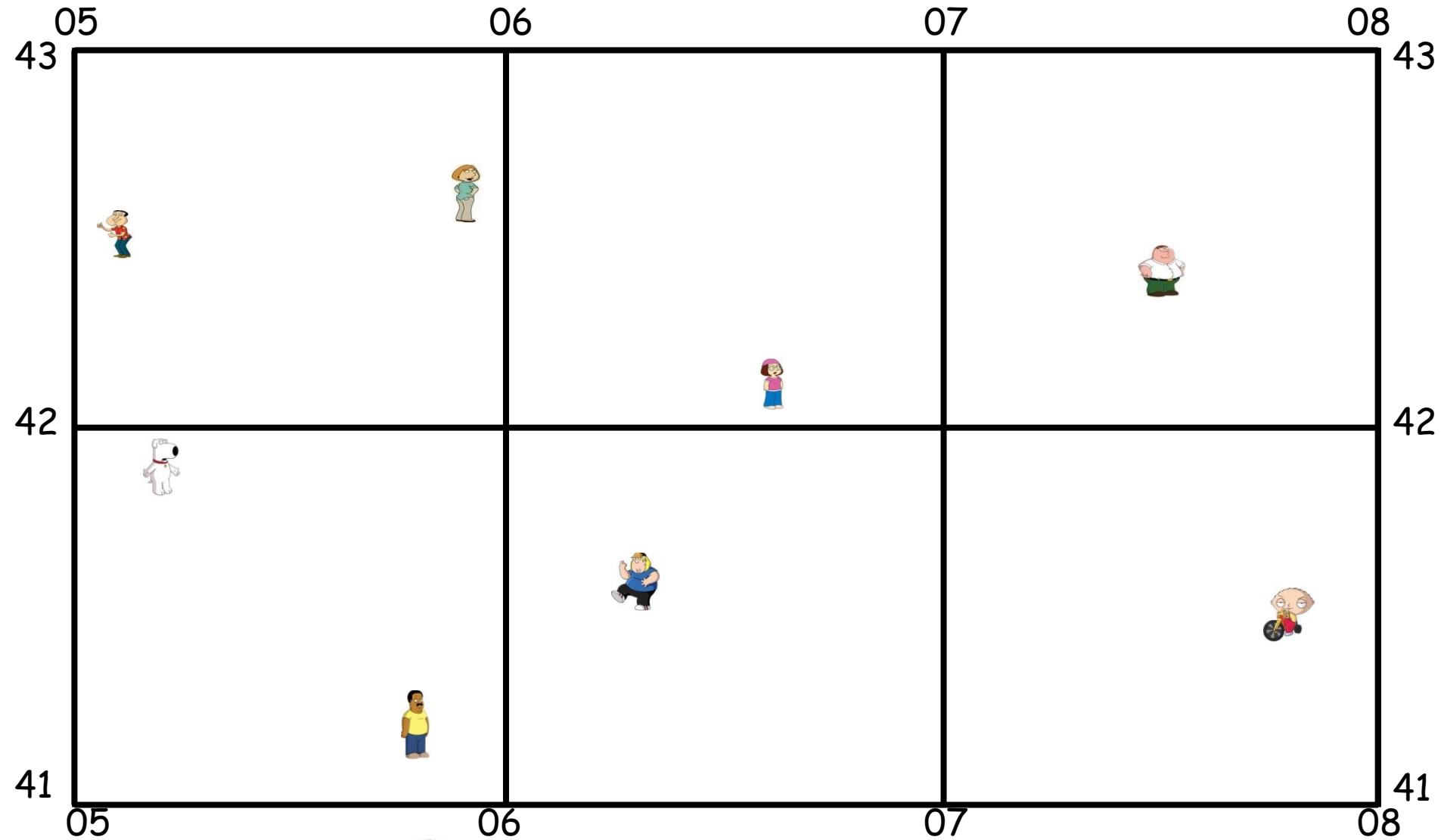
How is a rollercoaster like a bend in a river?



Four figure grid references



Six figure grid references



1=



3=



5=



6=



2=



4=

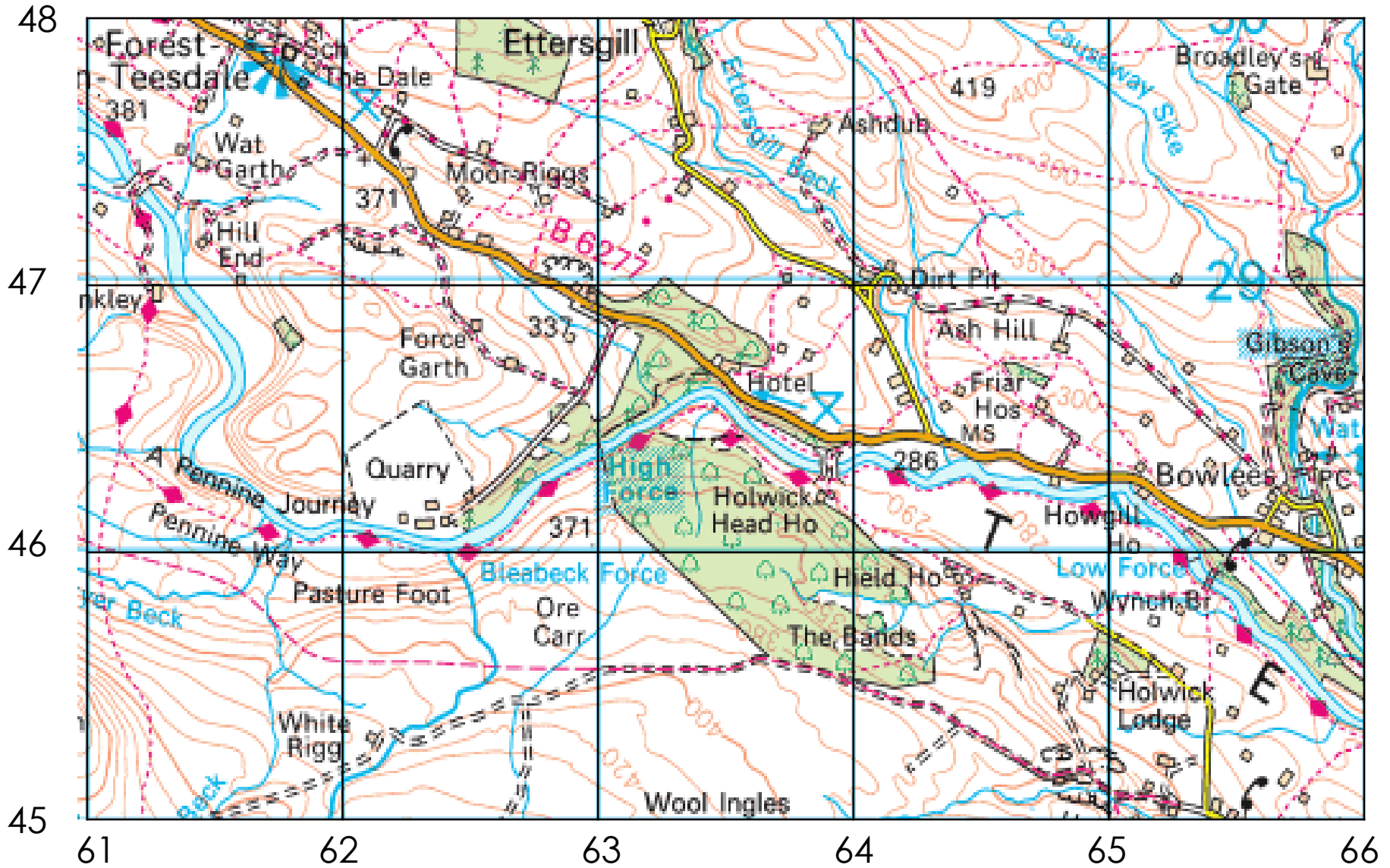


6=



7=

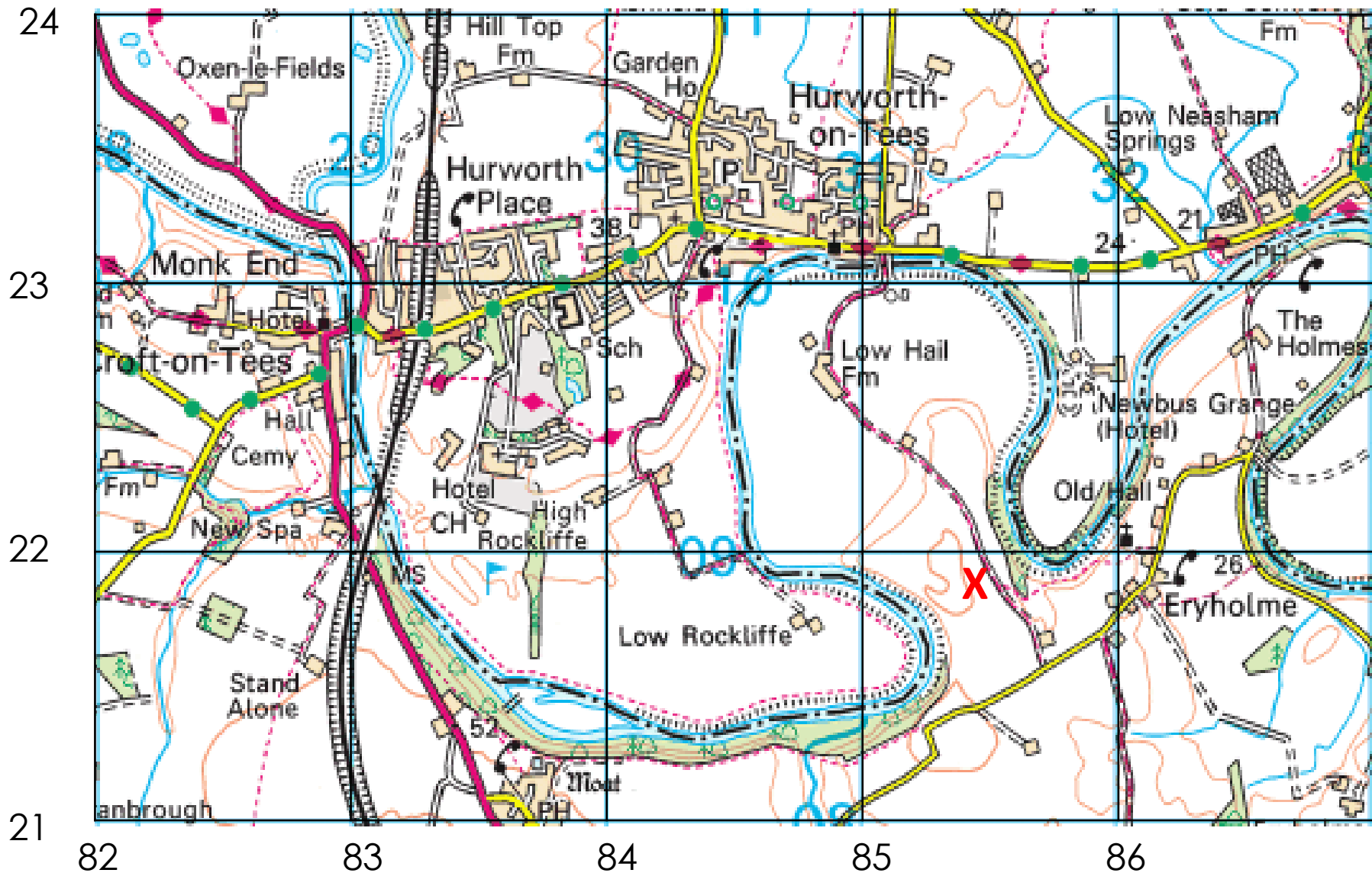
Upper Course of River Tees



4 figure for High Force waterfall?

Evidence of upper course?

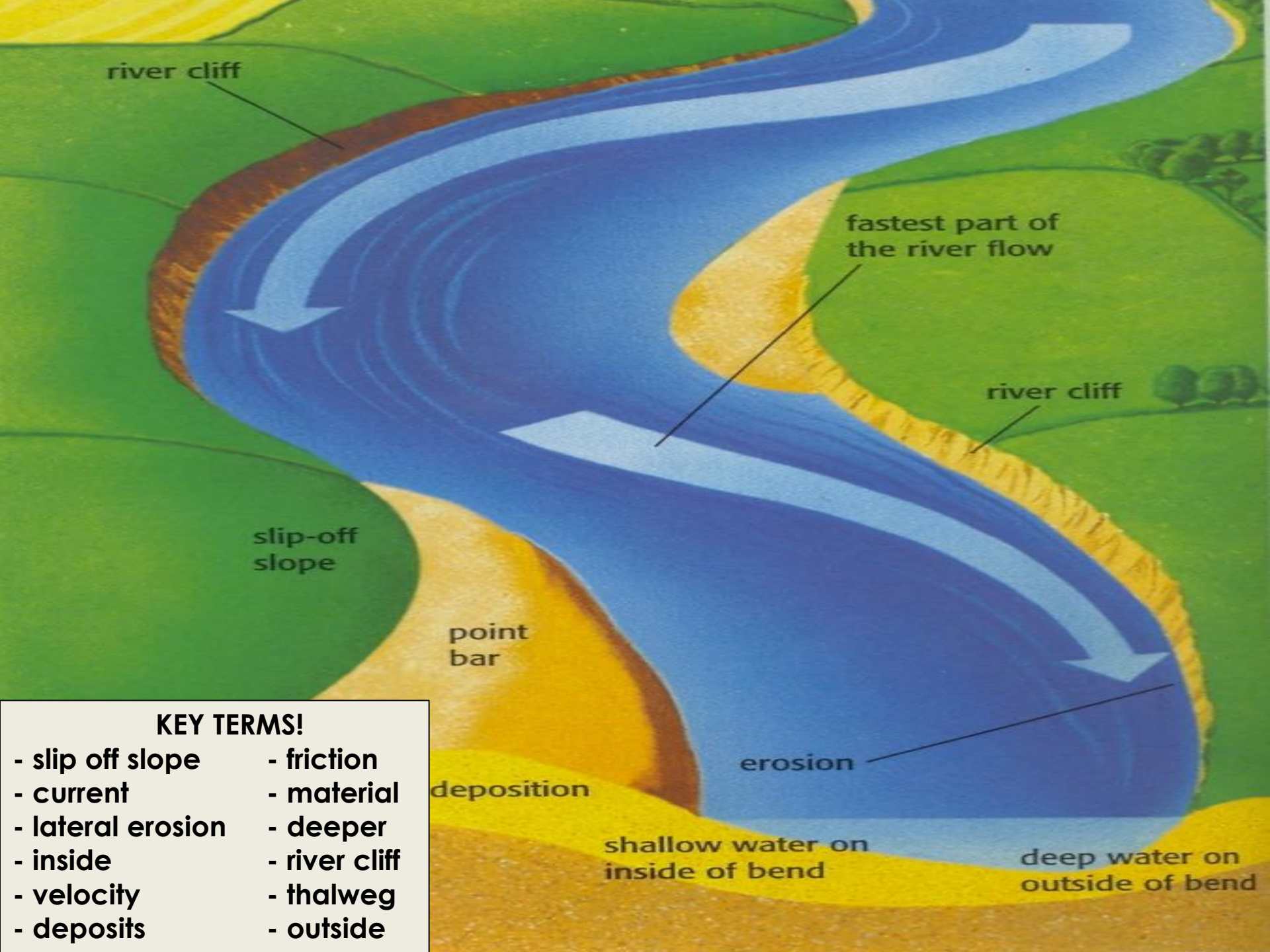
Middle Course of River Tees



6 figure for X?

Evidence of middle course?





river cliff

fastest part of the river flow

river cliff

slip-off slope

point bar

erosion

deposition

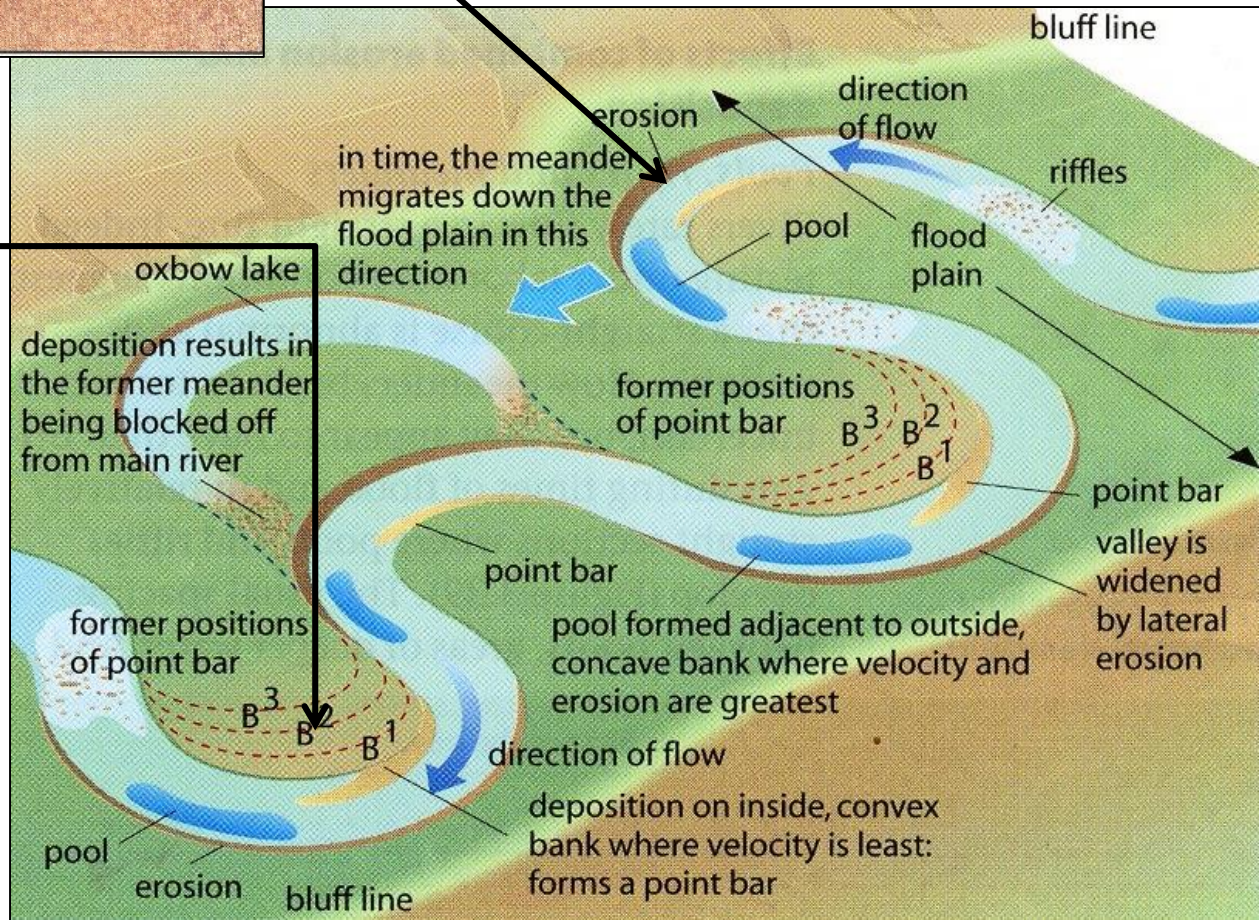
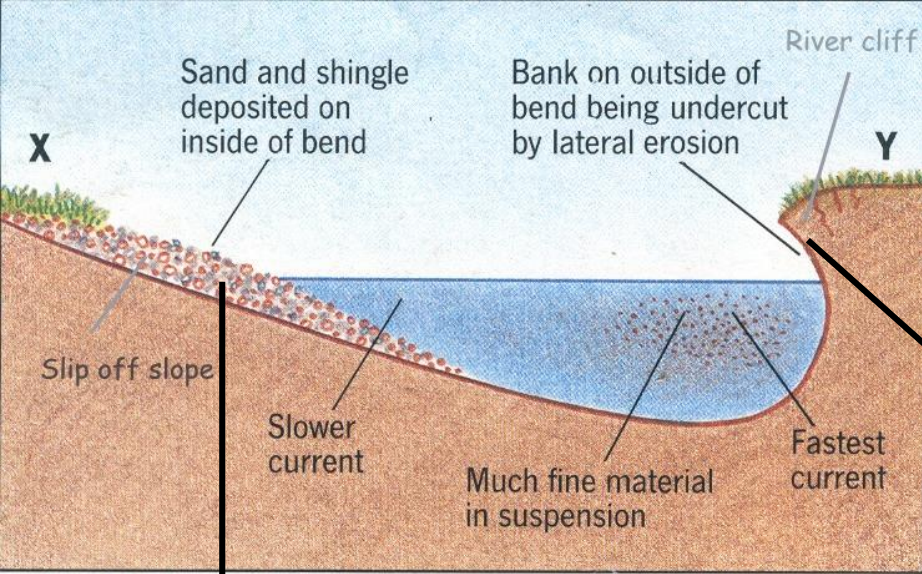
shallow water on inside of bend

deep water on outside of bend

KEY TERMS!

- slip off slope
- current
- lateral erosion
- inside
- velocity
- deposits
- friction
- material
- deeper
- river cliff
- thalweg
- outside

Meanders and Ox Bow Lakes



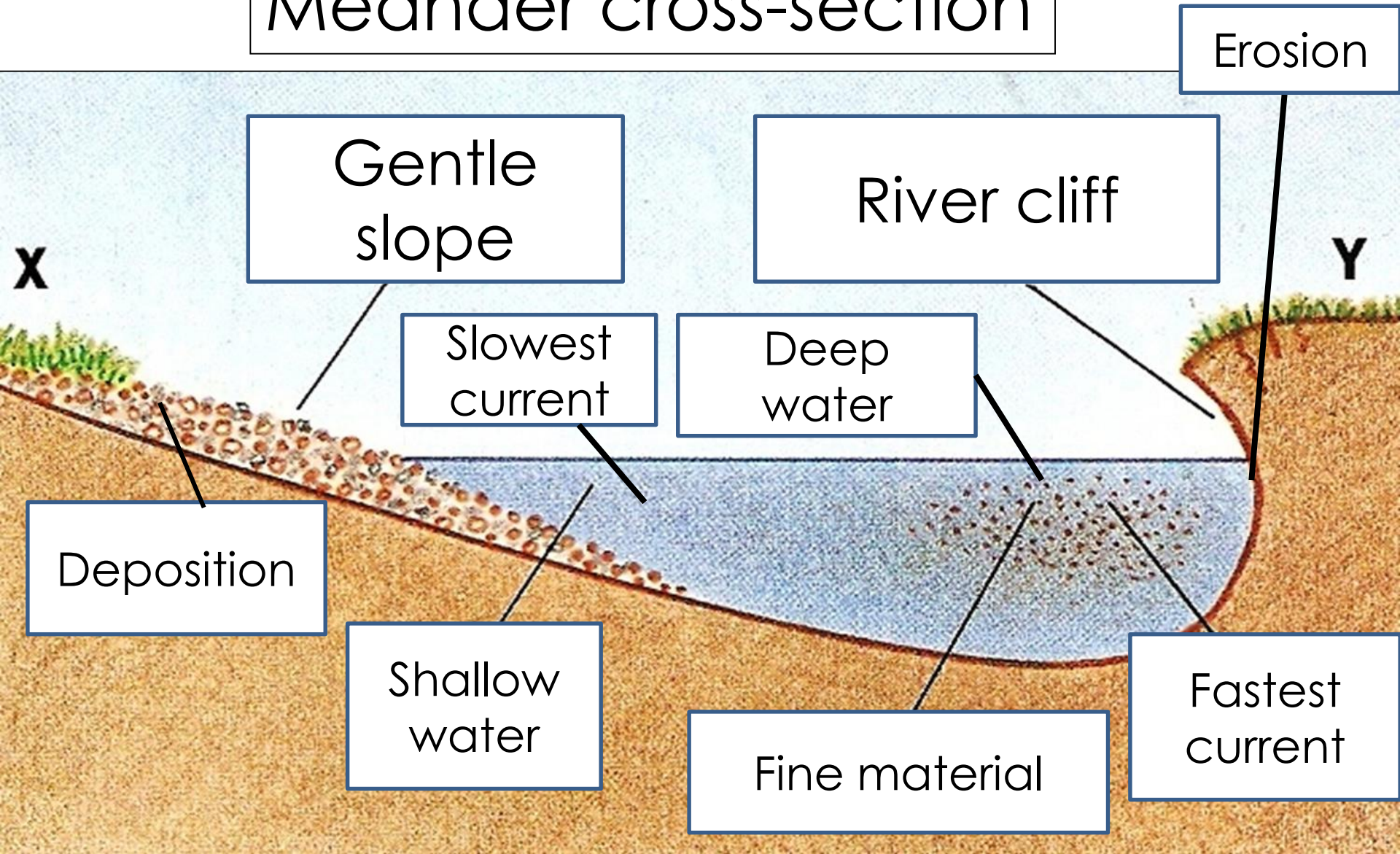
KEY TERMS!

- slip off slope
- current
- lateral erosion
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- friction
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What are the key features of the middle course?



Meander cross-section



Explain how a meander is formed.
Try to include as many keywords from the list as you can.

- slip off slope
- migrates
- lateral erosion
- inside
- velocity
- deposits
- friction
- material
- deeper
- river cliff
- thalweg
- outside

8

7

6

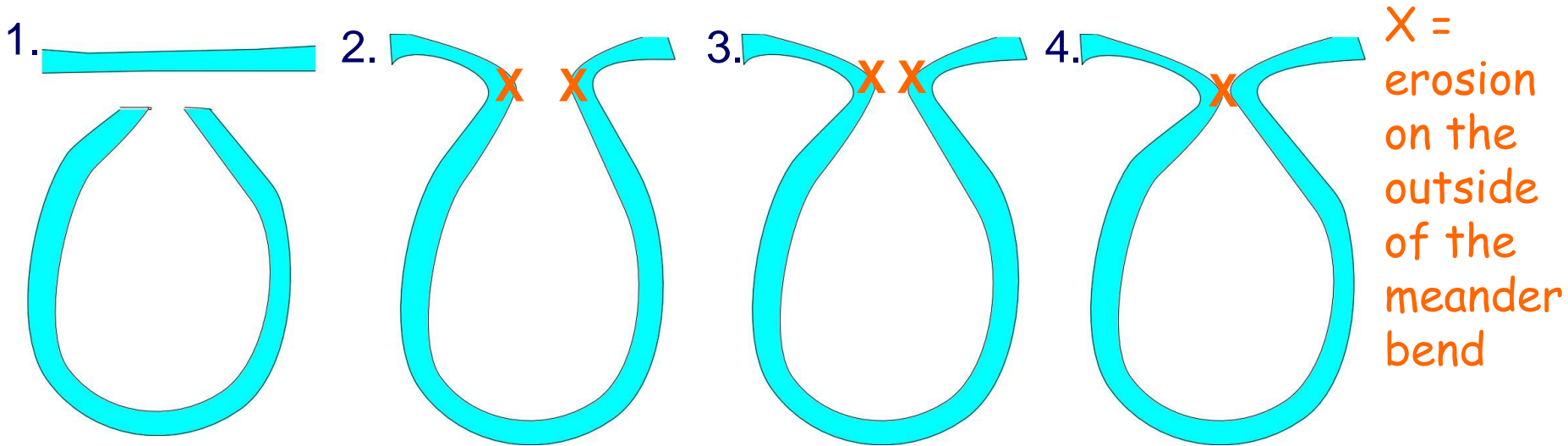
5

CHALLENGE



*A meander in a river is formed when the current flow is faster on the **outside** of the bend because the river is **deeper**. There is less...*

These sketches are in the incorrect order and the sequence is jumbled up, but use them as support if you wish:



- A. The river floods and erodes through the thin meander neck. The river now takes the easier, straight course. The meander loop is left as an oxbow lake.
- B. The fastest flow is on the outside bend of the meander. This fast current erodes the meander neck through the processes of erosion.
- C. The meander neck is further eroded until only a thin piece of land separates the two channels.

Annotate the river, showing **ox-bow lake** formation over time





Odd one out?

