

Changes in a river's course from source to mouth.

Revision points:

- A river's course can be divided into three stages; upper, middle, and lower courses.
- The upper course is characterised by large angular sediment, narrow shallow channels, vertical erosion and low velocity. Common landforms include waterfalls, gorges, V shaped valleys and interlocking spurs.
- Meanders are found in the middle course and the channel becomes wider and can migrate through lateral erosion.
- In the lower course sediment becomes smaller, rounder and smoother, channels are wide and deep and velocity is high in the channel. Common landforms are floodplains, levees and oxbow lakes.
- Estuaries or deltas are found at the mouth of some rivers.

School geography field trip

Student 1: Where is she taking us? We've been walking up this valley for an hour since we left the minibus! It's raining, I'm wet, cold, tired and look at my shoes! They're totally wrecked!

Student 2: Well, we were told to wear walking boots or wellies, not trainers, that denim jacket isn't exactly warm, or waterproof!

Teacher: Come on you two stop chatting! Gather round please and listen! Now, we have reached our last measuring point. This point represents the upper course of the river. Remember what we discussed in class?

You need to measure the width and depth of the channel, the velocity of the water by timing a float travelling down a 5 metre stretch of river, and the length of a sample of 10 pebbles from your measuring point. You should also judge how angular or round the pebbles are using the cards showing Powers scale of roundness.

Use your work sheets to remind yourselves of the techniques and make sure everyone in your group pulls their weight. I'll be along in a moment to see you all.

Student 1: She'll be swanning around with that camcorder more like.

Student 2; It's important to get an idea of what the landscape is like. We'll be able to compare it to the measuring points in the middle course when we get back to class, especially if our field sketches get all soggy in this rain.

Student 1: Oh don't worry! I won't forget this landscape. Cold, wet, miserable, steep, sheep droppings everywhere and big slippery rocks in the river.

Student 2: What do you expect? We're at high altitude and all this land is good for is rough pasture for sheep.

Student 1: I suppose. Right, well I'm not getting my hands cold and wet. You lot collect the results and I'll write them down.

Teacher: How is this group getting along then? What have we discovered? Any differences between here and the measurements we took earlier in the middle course?

Student 2: Well, so far we've found the river channel to be much narrower and shallower. It's only a couple of metres wide. There are lots of large rocks here which we didn't find in the middle course. The water is also much slower; probably because the sediment is slowing it down; there's more friction in this smaller channel.

Teacher: Very good! And why is the channel much narrower here? Do you know?

Student 2: Is it because the river is eroding vertically here, trying to reach its base level at the sea, whereas it erodes laterally in the middle course which makes it wider there; our measurement for the middle course was about 5 metres wide I think. There's also less friction in the middle course due to the larger cross section which makes the water flow faster. We also had a meander at our measuring point and we noticed that the water on the outside bend was flowing much faster than on the inside where it was shallower.

Teacher: That is a good comparison, so what about the lower course? If it were possible for us to take some measurements there, what do you think we would find?

Student 2: Would it be wider, deeper and faster again?

Teacher: Yes...and the sediment?

Student 2: Rounded, small, probably lots of very fine material like silt which might be deposited on the floodplain when the river floods.

Teacher: Excellent! Right, gather up the equipment please. It's starting to rain much more heavily now. Let's go back to the minibus.