Links to Syllabus

- Core Unit 3
  Skills
  Geographical Investigation

- Core Unit 2
  1.5 Fluvial processes
  1.6 Fluvial adjustment
Skills

- Mapping
- Photographs
- Sketching
- Statistical analysis
- Data collection
- Report planning
- Analysis of results
- Evaluation
Aims

- River Valley
  - to identify river features
  - to construct a cross profile of the valley

- River Channel
  - to calculate the discharge
  - to determine the efficiency of the channel
  - to see whether the channel is meandering

- River Load
  - to determine the average grain size of the bedload
  - to determine the roundness of the bedload grains
Possible Hypotheses to Test

- **River Valley**
  - river valleys change along their courses
  - features of river erosion occur in upland areas only

- **River Channel**
  - river channels become more efficient downstream
  - discharge varies with stream order
  - meandering increases downstream

- **River Load**
  - river bedload grains become smaller and more rounded downstream
Planning

- Choosing a suitable location
  - accessible from school
  - access approved if on private land
  - safety
  - for comparative studies order the stream network
Ordering a River Network

- Trace out river network from an OS map
- Order the streams as follows:
  - 1st order streams have no tributaries
  - Two 1st order streams joining up make a 2nd order stream
  - Two 2nd order streams joining up form a third order stream and so on
Collection Methods

- Field sketching/photography
- Do a slope transect to be able to draw a cross-profile of the valley
- Measure width, depth and speed to determine discharge
- Measure the wetted perimeter to calculate the efficiency of the channel
- Measure the straight and curved distances to determine if the river is meandering
Collection Methods

- Randomly select grains from the river bed using a pebbleometer
- Measure the axes of the grains using a pebbleometer
Equipment Needed

- Viewfinder
- A measuring tape
- Metre sticks
- Ranging poles
- Clinometer - Abney Level - Pantometer
- Quadrat
- Pebbleometer
- Surveyor’s chain
Fieldsketching

- Select a position which gives a good view of the study site
- Observe the site carefully
- Identify river features
- Use a viewfinder to help draw a field sketch
- Annotate the sketch
Fieldsketching
## Valley Transect

- Observe the valley carefully
- Identify the break of slope points
- Mark the breaks of slope with students of equal height or ranging poles
- Draw a sketch of the slope sections
- Measure the angle of slope and the length of each of the sections of slope
- Record these on your record sheet
Sketch of Slopes

Left Bank

B
A

D
E
F

G

Right Bank
Clinometer

Zero degrees

Forty degrees

Angle A equals $90^\circ$ minus $50^\circ$
Measuring Discharge

- To calculate discharge of a river you need the following information:
  - the width
  - the average depth
  - the distance the river travels in a second

- The above measurements should all be in metres
Width
Depth
Speed

C throws oranges - A shouts ‘go’ - D starts watch
B shouts stop - E records time
Channel Efficiency

- Place the chain along the bed of the river from A to B
- Make sure the chain covers all the ups and downs of the bed
- Take the chain out of the river
- Lay the chain out in a straight line
- Measure the length of chain with a measuring tape
- This is the wetted perimeter
Sinuosity

- Identify where the direction of the curve changes
- Mark these points with ranging poles
  or
- Get 2 students to stand at the points to mark them
- Measure the straight line distance between the points
- Measure the curved distance between the points
- Measurements can be paced where the curves are large
Load Analysis

- Wade into the river
- Throw a quadrat randomly onto the bed
- Lift the grains which touch the corners of the quadrat
- Bring them to the bank
- Measure their long, short and medium axes in the pebbleometer
- Repeat the process until you have measured 30 grains
Concluding Fieldtrip

- Check that all activities have been completed
- Do as many calculations as possible while moving between sites or on the bus
- Keep all worksheets and record sheet for processing and proof of work no matter how worn
- Gather up record sheet and fieldsketches
- Evaluate the fieldwork
Evaluation

- What problems did you face doing the fieldwork?
- Did all the equipment work?
- Had you prepared yourself well enough?
- What did you do well?
- What could be improved?
- What needed further study?