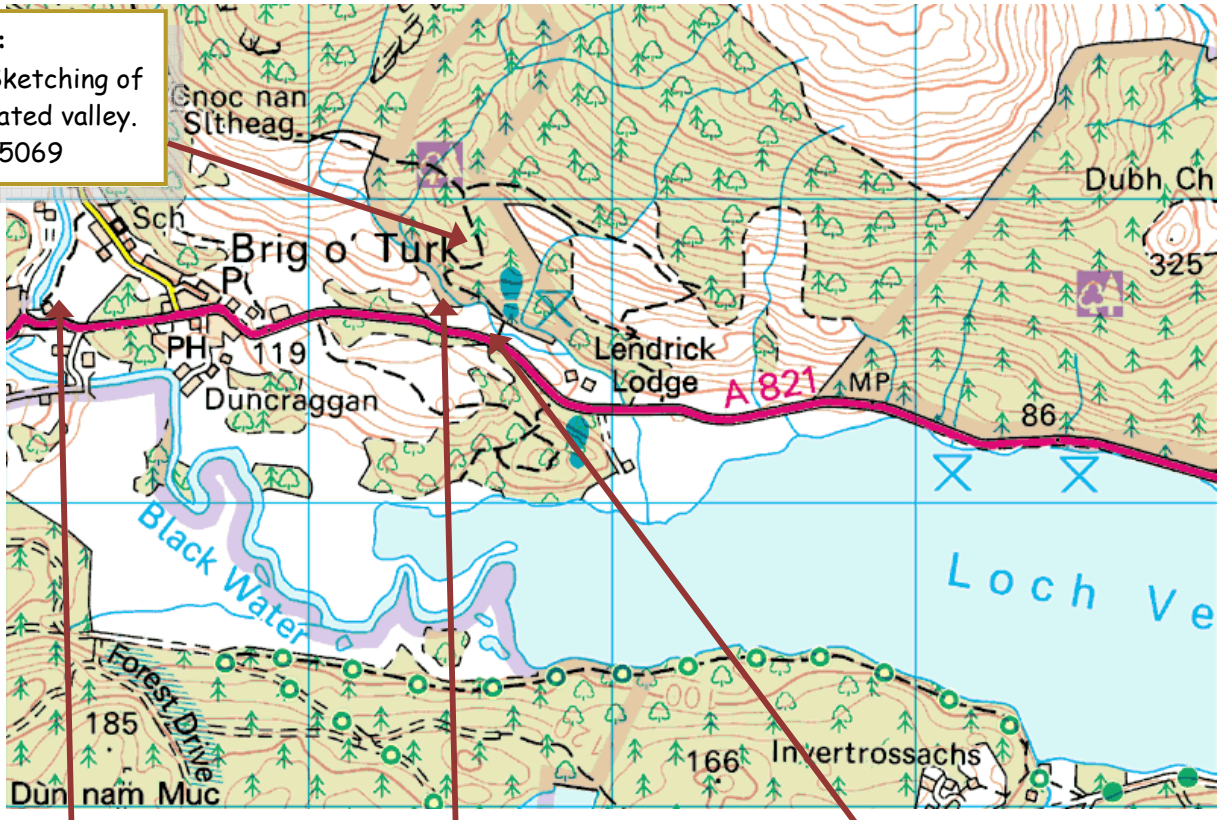
Geography Site Based Activities
Field Excursion to Lendrick Hill

Lendrick Hill Site Information

The Great Trossachs Forest is a fantastic place to go for a field visit. There are opportunities to study a glaciated upland landscape and its land uses first hand, undertake river fieldwork and explore sites of early settlement. There is also the opportunity to have a guided walk from a ranger, free of charge. Lendrick Hill is a great base for your activities. There is ample parking for a bus at the Woodland Trust's Lendrick Hill Car Park (just off the A821 1 mile from the village of Brig o' Turk- see site 2 on the map below).

At this site there are four main sites to focus your outdoor learning activities:

Site 1:
Field Sketching of a Glaciated valley.
GR: 545069



Site 4:
Large river study area: flow rate measurement and feature sketching for comparison to site 2.
GR: 531066

Site 3:
Slope profiling area.
GR: 544067

Car Park Location & Site 2:
Small scale river study area: Width, depth and bedload measurement.
GR: 546065

Note: At any of the sites, land use, land use conflict and tourism studies can also be carried out. For more information on visiting TGTF and sources of support see the 'Bringing a Class to The Great Trossachs Forest' resource and map.

Teacher Notes

Producing a Field Sketch

The prepared sheet overleaf can be given to pupils to help them record important elements of their field study. Photos will be available on the day to show the glaciated features available should the weather not be suitable for field sketching.

Equipment list:

- Pupil sheets, one per learner
- Clipboards, one per learner
- Pencils and erasers in case pupils don't have their own
- A map of the area to annotate features (eg the OS map available within this resource)
- A compass to take a bearing
- Cardboard cut out frames to help frame the sketch
- A camera – pupils may wish to photograph the view to work on the sketch at a later date

River Survey

The Great Trossachs Forest is an ideal place for some river fieldwork. In this activity pupils measure river features and see how they vary at different locations. At the Lendrick Hill car park (site 2 on the map) there is a small river which rarely rises above the height of welly boots. It can be accessed from both sides of the river, and evidence of deposition, erosion and meander can all be seen at the site. Site 4 shows a much deeper river and at different points the difference in deep water slower flow and fast ripples are clearly seen from a nearby path. The comparison between the two sites will be very evident.

The pupil sheets below gives instructions on how to measure width, depth, velocity, discharge, gradient, bedload and suspended load, with space to pupils to record their findings. Pupils can analyse the data gathered and prepare reports on their findings.

Remember to risk assess the activity using both the sample risk assessment and guidance from TGTF staff. Give clear instructions on sensible and safe behavior whilst pupils are working on or by the river. Pupils should not go in deeper than their wellies!

Equipment list:

- Wellingtons and waterproofs for pupils and yourself
- Long (metre) rulers and small 30cm rulers
- Rope
- Tape measures
- Stop watches
- Ping pong ball or other float (such as wine cork)
- Spirit level or dumpy level for measuring gradient
- Calculators
- Clipboards
- Camera to record the action

Other possible site based activities (sites nearby are the most suitable locations)

Tourism and its impacts

Pupils can use the prepared questionnaire within this resource to interview tourists in one of the many car parks. For large school groups, the Trossachs Pier at Loch Katrine makes an ideal location as there will be sufficient tourists on site to enable a wide range of interviews. The tables can be used as a tally chart so pupils can record the results of several individual surveys on one sheet. The results of the questionnaires from the whole class can be collated and pupils can prepare a report analysing their findings. This activity incorporates enquiry skills as well as data processing and analysis.

Whilst visiting The Great Trossachs Forest and speaking to visitors pupils will be able to see positive and negative impacts of tourism on the area. It may also be possible to arrange to interview the ranger during your visit, in which case they will be another resource with information about the impact of tourism in the area. At the end of the field trip, ask the class to suggest positive and negative impacts of tourism they have noticed. These can be recorded on the relevant pupil sheet.

The classroom activities pack contains survey information which can be used to compare and analyse in relation to the results of students findings.

Land use and Land use conflicts

At Bochastle, walk along the path towards Milton and during the walk ask the students to note down the different land uses they see. If time, then climb a little up the hill towards Sampson's stone as the higher more land uses that come into view higher up the hill.

When reviewing the various land uses with pupils, discuss the potential conflicts between them, and possible mitigation.

Pupil Activity Sheets

Glaciation Field Sketch: At site 1 look in a south-easterly direction

Field sketches are a useful way of recording important elements of a field study. The sketch does not need to be very detailed or artistic. The important thing is to accurately record as much information as possible. Holding up a cardboard frame can be a useful way of identifying a frame for the sketch. Drawing a grid on your paper can also help. Start by roughly outlining the things that are furthest away, then work towards the foreground. Remember to label your field sketch with descriptions of key features such as names of features and the height of peaks.

Hint: You should be looking at a flooded U shaped valley. This feature that you see is a ribbon loch, left behind by the Loch Lomond 'mini ice age'.

Date of sketch: _____ Name_____ _____

Location: Direction _____ Grid reference _____

Short description of view: _____

_____

_____

River Studies

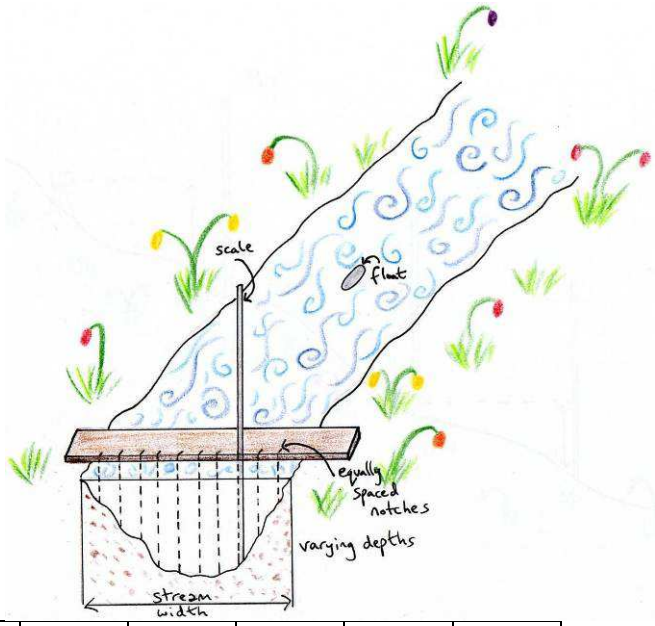
River Survey Record Sheet 1

At site 2 (Lendrick Hill car park) **Survey location grid reference_____**

Width

Use a tape measure or rope held across the channel from bank to bank to measure the width at the water's surface.

Width = _____



Depth

Measure the depth at equally spaced intervals (e.g. every 20cm) across the width of the river. If the river is not too wide it may help to lay a piece of wood across the river and mark off the spacing to measure down from.

Distance (m)	0										
Depth (m)	0										

Distance (m)											
Depth (m)											

Average depth = _____ m

Cross sectional area of river = width x average depth = _____ m^2

Velocity

Measure the speed of the surface water mid-stream by timing a float over a 10m distance. Choose a part of the stream where the cross section is regular.

Time taken to travel 10m = _____sec

Speed of float = _____ m/s

Velocity (average speed for whole stream) is speed of float x 0.8 for a straight smooth channel or x 0.6 for a rocky stream.

Velocity = _____ m/s

Discharge

The discharge or flow rate of a river = velocity x cross sectional area

= _____ m^3/s

River Survey Record Sheet 2

Can be conducted at either site

Bedload

Collect 20 pebbles at random from the river bed at each site and rate them in terms of their roundness using this tally chart.

Very angular	
Angular	
Sub-angular	
Sub-rounded	
Rounded	
Very rounded	

Select 10 of the pebbles and then use a ruler to record the shape of it by measuring the X,Y and Z axis. Record your measurements below. Make a note of any thoughts or reasons why the pebble is of a certain shape or size. This can be discussed later on back in the classroom.

	X	Y	Z
Sample 1			
Sample 2			
Sample 3			
Sample 4			
Sample 5			
Sample 6			
Sample 7			
Sample 8			
Sample 9			
Sample 10			

Notes on size and shape = _____

_____

_____

Suspended Load

Take water samples at each site (try not to disturb the water too much while taking the sample). Leave the sample to settle for a few minutes and analyse characteristics such as colour, thickness of collected layer, water clarity and settling rate. You could also dry out the sediment and weigh it.

_____

_____

_____

_____

_____

River Survey Record Sheet 3

To be undertaken at site 4 (next to the bridge in the village of Brig o' Turk)

River Flow Study

At site 4 you can compare the width of the rivers that you have studied today. Use this site to access at the gravel bank next to the river. Measure out a 10m section of river and measure the flow using a floating object timing it from the start to finish. A dog biscuit is ideal as they float and they are biodegradable and do not harm the environment. Repeat these measurements 10 times and work out your average. Use the table below to record your findings.

Measurement number	Time take in seconds
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Average time in seconds: _____

Space for additional calculations and measurements:

Slope Profiling

Can be conducted at any location on Lendrick Hill (site 3 is recommended).

At this site feel free to spread out and choose an area that you think is interesting.

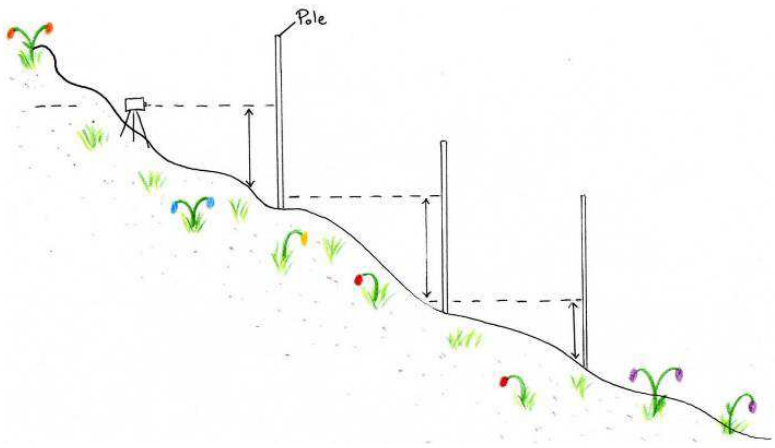
Measuring slope profiles

Using a tape measure, measure out a 10m length. Use the gun clinometers (or you may have made your own with a protractor and some string) and measure the angle on a 100 meter section of slope. Record each section on the table and you can then plot these onto a graph when you get back to school. Please be careful of the rocky outcrops here. They are made of slate and can be slippery when wet. Avoid standing on the young saplings, they are living things as well!

Gradient

The gradient of a slope is given by the amount it rises vertically divided by the horizontal distance covered.

To measure this use a spirit level or dumpy level to measure vertically and horizontally up the slope in stages.



Measurement number:	Height (m)	Slope angle in degrees	Other notable features eg rocky outcrops
10m			
20m			
30m			
40m			
50m			
60m			
70m			
80m			
90m			
100m			
Total (height change)			

Gradient = total height / total distance = _____

Tourism Questionnaire

(Survey questions courtesy of The Loch Lomond and The Trossachs National Park, created by Ashley Read)

We are pupils at _____ High School. We are visiting the area today to do a study of tourism and its impact on the local area – would you mind answering a few questions for us? It will only take a minute.

1. How have you travelled here today?

Car	
Coach	
Cycle	
Walked	

2. Where is your normal place of residence?

Central Scotland	
Other Scotland	
England	
Mainland Europe	
Other	

3. How many people are in your party today?

1-2	
3-7	
8+	

4. How long do you plan to spend here?

Up to ½ hour	
½ - 1 hour	
1 – 4 hours	
All day	
More than 1 day	

5. Why are you here today?

Resting point only	
Stopped for picnic/refreshments	
Stopped to use Café	
Admire view/photos	
Children to play	
Look at plants/wildlife	
Use visitor centre	
Other	

Name _____

Tourism Impact Pupil Sheet

(Survey questions courtesy of The Loch Lomond and The Trossachs National Park, created by Ashley Read)

1. List five **negative** impacts of tourism in The Great Trossachs Forest that you have seen (social, economic and environmental)

   (i) _____

   (ii) _____

   (iii) _____

   (iv) _____

   (v) _____

2. List five **positive** impacts of tourism in The Great Trossachs Forest that you have seen (social, economic and environmental)

   (i) _____

   (ii) _____

   (iii) _____

   (iv) _____

   (v) _____