GLACIAL FEATURES DEFINITIONS

Fill in the box for each of the features labelled on the diagram below: give an example of the feature (either one you have seen today or a more famous example) and a definition of the feature, including how it formed.

Pyramidal Peak **Example:**

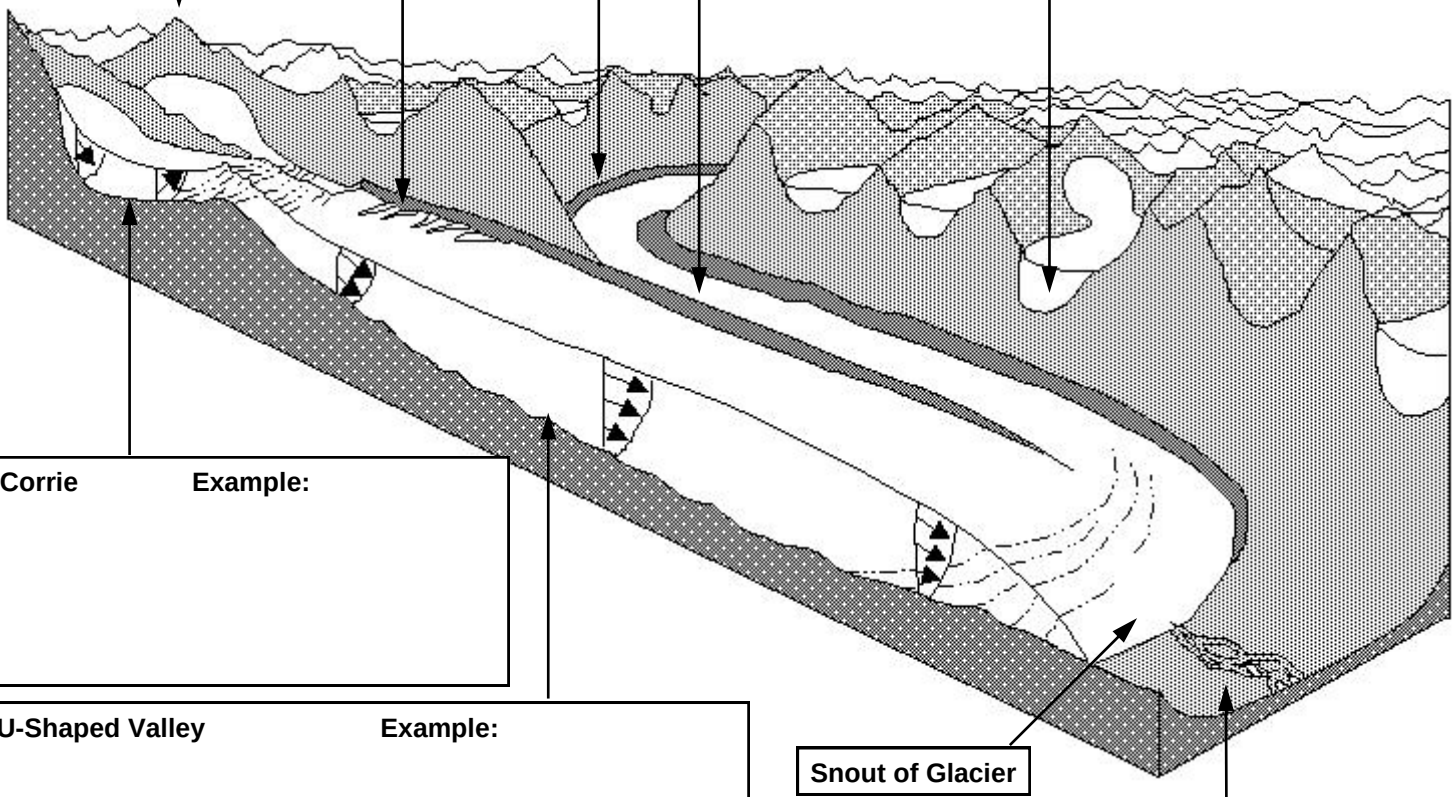
Arête **Example:**

Lateral Moraine **Example:**

Medial Moraine **Example:**

Hanging Valley **Example:**

Crevasse



Corrie **Example:**

U-Shaped Valley **Example:**

Snout of Glacier

Outwash Plain **Example:**

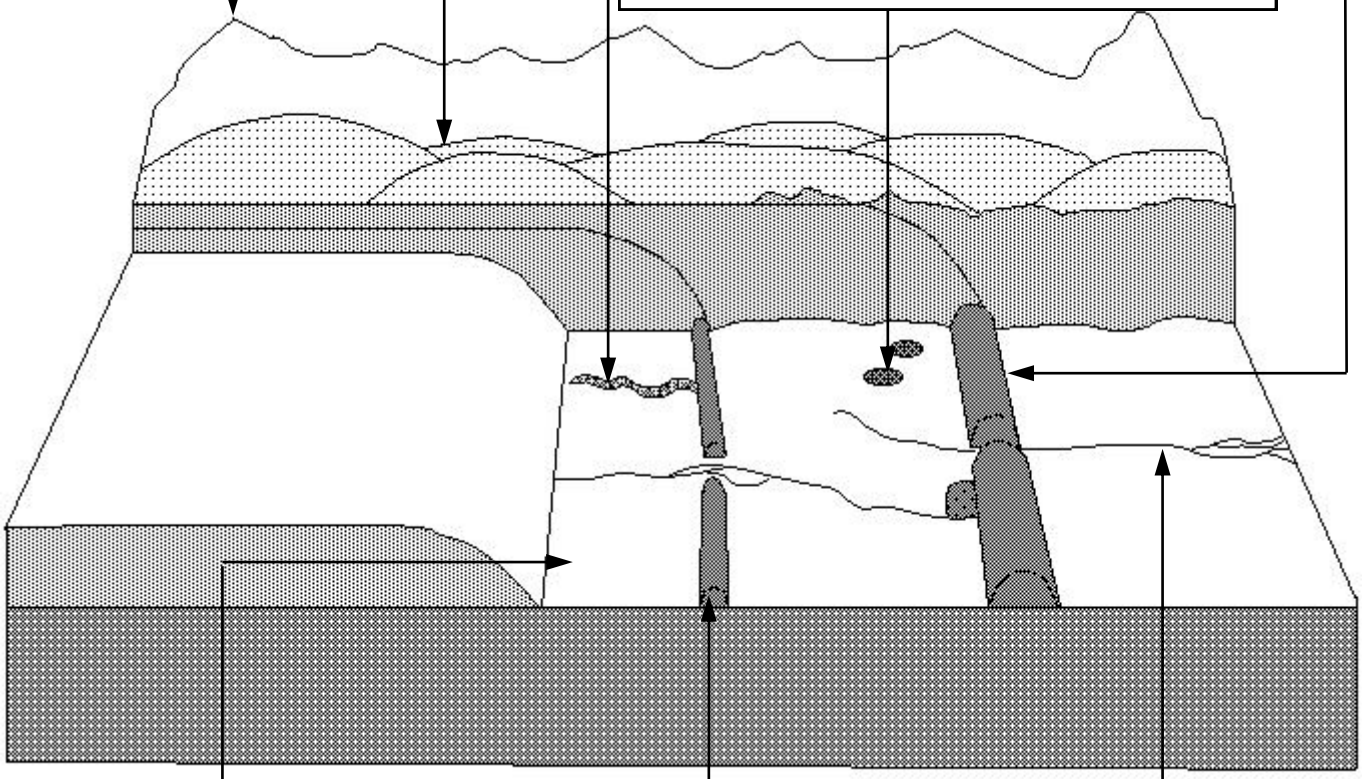
Nunatak **Example:**

Terminal Moraine **Example:**

Ice-rounded Hill **Example:**

Esker **Example:**

Kettle Hole **Example:**



Recessional Moraine **Example:**

Till **Example:**

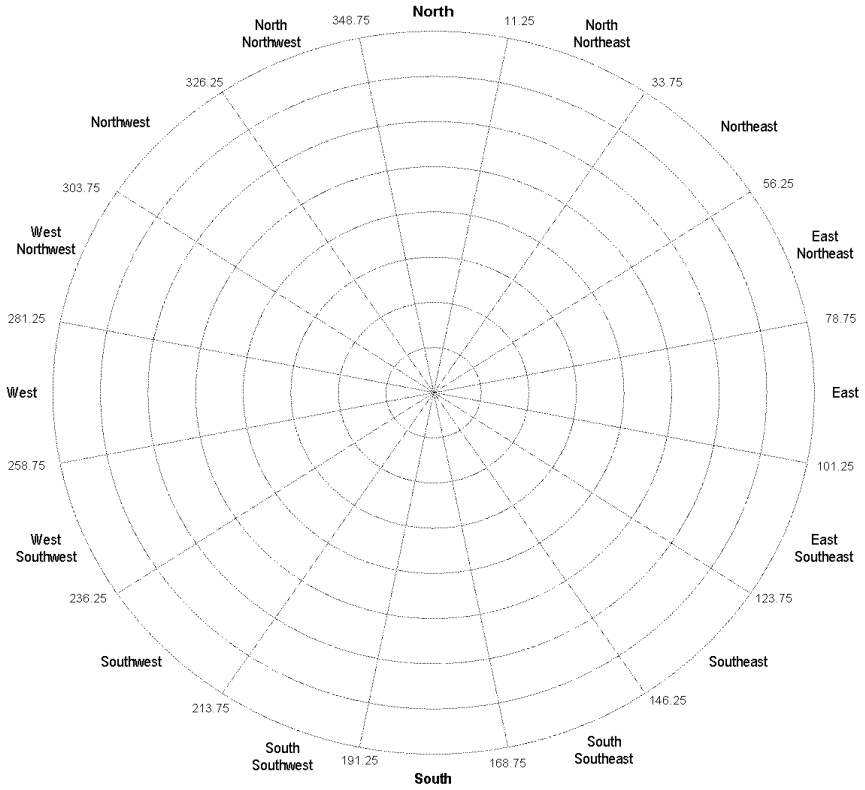
Misfit River **Example:**

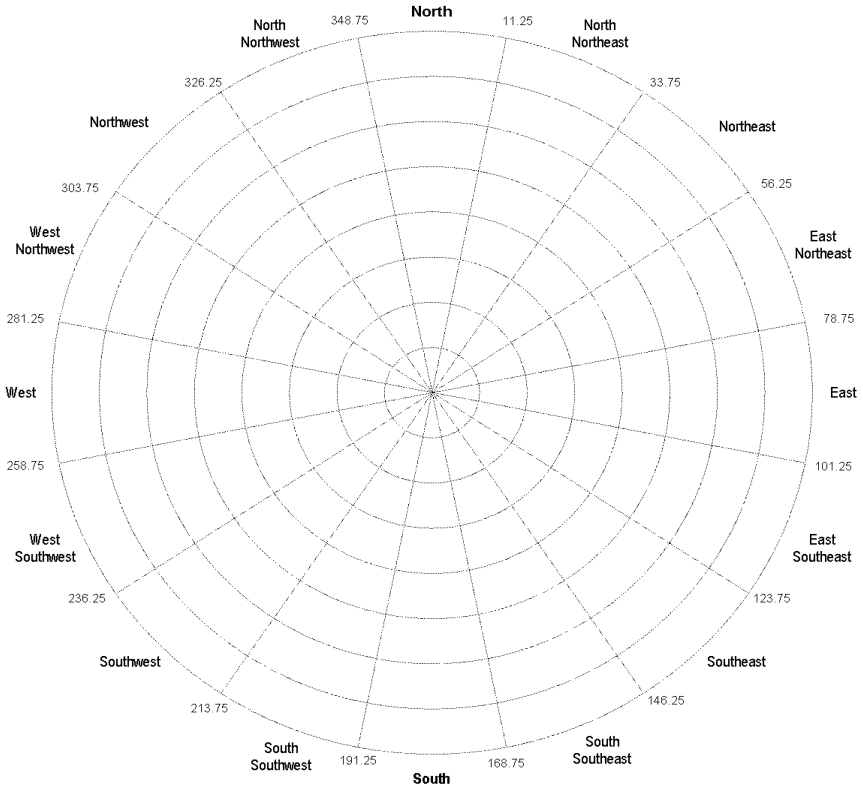
IDENTIFYING GLACIAL FEATURES

Using an Ordnance Survey map of Arran, identify glacial features and complete the table using the grid reference, local name or feature description. For some there may be more than one option. Draw a sketch of what the feature looks like, paying particular attention to contour lines.

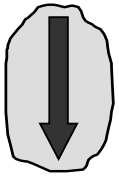
Grid reference	Local name	Glacial feature	Sketch of feature
99 41	**Stachach**		
960414			
		Hanging Valley	
967414			
		U – shaped Valley	
992395			
	Coirein Lochain		
		Outwash plain	

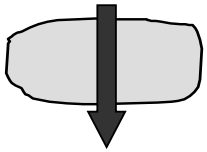
SEDIMENT ANALYSIS





A-AXIS TREND	EASAN / CHALM.	GLEN ROSA
349-011 / 169-191		
012-033 / 192-213		
034-056 / 214-236		
057-078 / 237-258		
079-101/ 259-281		
102-123 / 282-303		
124-146 / 304-326		
147-168 / 327-348		





Pebbles in a river are rolled along their 'B-axis'. Therefore when they are deposited many of the pebbles will have their 'A-axis' orientated across the river. A glacier, on the other hand, carries pebbles frozen within the ice. They are transported with the A-axis orientated in the direction of ice flow.

SEDIMENT ANALYSIS

Sediments can be deposited in a variety of environments e.g. desert, **glacial, marine, fluvial** and lacustrine. A number of different processes may have **transported** the sediment since its initial erosion from the parent rock. On Arran, for example, rivers or glaciers once transported many deposits found on the beach today. An investigation of such sediments can tell us a great deal about their history and the origins of the landform of which they are a part.

There are a number of different techniques we could use to determine the environment of deposition:

Angularity

The shape of a pebble relates to the way it has been transported. In a river or in the sea material is rolled along its **'B-Axis'**. As a result it becomes more rounded due to progressive **attrition**. In contrast a glacier carries material along in the ice and it therefore does not become rounded. If the majority of the material in a deposit appears angular it is more likely to be glacial in origin than fluvial. To make analysis of the shape less **subjective** we use a geological classification known as **'Powers Index of Roundness'**.

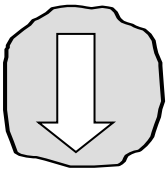
Sphericity

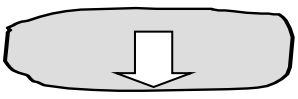
Sphericity is a more accurate measurement of the pebble shape than the visual comparison of 'Powers Index'. It can be calculated from an equation using measurements of the A, B and C axis of each pebble in the sample giving a figure ranging from 0 – 1, where one represents a perfect sphere.

Orientation

Pebbles in a river are rolled along their 'B-axis'. Therefore when they are deposited many of the pebbles will have their 'A-axis' orientated across the river. A glacier, on the other hand, carries pebbles frozen within the ice. They are transported with the A-axis orientated in the direction of ice flow.

Direction of glacier flow





Direction of river flow

Sorting

In this process materials are graded according to one of their attributes such as size and shape. Sediments that have been repeatedly re-worked by marine waves or have travelled long distances downstream in a river are usually well sorted into different sized particles, because different particles have different settling velocities. Sediment transported by glaciers and mass-movement tend to be poorly sorted.

Stratification

Stratification is where sediments are laid down in horizontal layers. This may be due to variations in energy within the agent of deposition. For example, a meltwater stream from a glacier will have fast and slow moving currents like any other stream. The slow moving currents will deposit smaller sized sediments and the fast moving currents will deposit larger sediments. In contrast the deposits of a glacier (till) are a mixture of different sizes from small particles of clay to large boulders.