

Glacial Deposition Revision Sheet ~ Terminal Moraine

These are arc shaped ridges made up of rocks deposited at the front or snout of a glacier.

As a glacier moves along a valley it gathers much eroded material, which it transports down the valley. This material results from abrasion plucking and freeze-thaw, as well as other sources. This material is transported by the glacier in a variety of ways, firstly rocks falling onto the glacier surface are moved down the valley with the glacier itself. Some of these rocks fall into crevasses and slowly work their way forward through cracks in the glacier. A final way is that rocks on the valley floor are pushed along or bulldozed by the snout of the glacier.

The furthest point reached by the glacier snout is where the debris is dropped, leaning against the glacier itself. When the ice melts there is a small amount of collapse before a ridge is formed marking the end point. The material deposited is unsorted as there has been little to no water present to carry and arrange it into stratified layers. This means that the erosive action of water has not rounded the rocks.

As temperatures rise, the glacier retreats and at each stage of retreat it can leave a terminal moraine, a series of terminal moraines found after each other are called recessional moraines. The glacier does need to remain stationary for a period of time to let deposits build up at its snout and leave a sizeable moraine. They can be as high as 30 to 40m and are typically as wide as the valley or corrie they are found in. Another type of terminal moraine is called a push moraine and occurs when a glacier has stopped and formed a terminal moraine only for it to re-advance and push the moraine beyond this point. Such fluctuations are a result of cooler temperatures allowing a build up of ice and hence glacier flow.

Glacial Deposition Revision Sheet ~ Drumlins

These are small hills found in valleys and resemble half an egg cut along its long side.

They consist of rocks, stones and sand, which have not been sorted, meaning they are all jumbled together without being arranged in horizontal layers by water. As there has been little or no water present in their development they remain angular in appearance, as there has been no attrition to grind the edges down. They are made of glacial till, which is also called ground moraine. They form sub-glacially, this means under the glacier. The till comes from material scrapped along by the moving glacier.

Drumlins have a steeper and shorter stoss side, which faces into the moving glacier, and a gentler and longer leeward side.

They can be found in groups of drumlins called swarms and roughly lie parallel to each other, quite often they are referred to as "basket of eggs" topography.

There are two theories as to how they developed. One idea is that previously deposited till has been dragged along by the glacier and sub-glacially moulded into shape by faster moving ice. The other theory is that they are erosional features carved out of the till by the advancing glacier.

They vary in size, typically being 20-30m high, 30-40 wide and 50 to 100m long, though they can stretch for over 1Km in length.

Glacial Deposition Revision Sheet ~ Eskers

These are narrow, winding and steep sided ridges found in areas, which were beneath or just beyond the glacier.

They are made up of rocks and stones, which have been sorted by water, this means they have been layered horizontally and arranged in groups according to their size. This sorting has however been disrupted somewhat as they have been dropped on the ground by a retreating glacier. They have been formed by water and ice so have been subject to attrition and eroded to become rounder than more angular moraine.

They are in effect river beds which developed in streams found within (en-glacial), on top of (supra-glacial) and below (sub-glacial) the glacier. As with any other river you will find that upstream deposits are larger and less rounded than the downstream deposits. The further along the course of the esker the more rocks have hit each other and become smaller and rounded. Larger rocks are found upstream as they can only be moved, by a great force of water so are typically dropped first when water energy is high. If boulders are found lower down the esker, it will be a result of a flood, due to melting, giving the river enough energy to transport them there. When the melt conditions subside the river energy drops and so they are deposited. This movement leads to horizontal layers of boulders being found amongst finer deposits. When the glacier starts to melt it breaks up and can no longer support the river bed so drops it on to the ground below, this disrupts the sorting and is called semi-sorted material.

Sometimes it is possible to find larger and higher deposits along the line of the esker. These are called beads and are formed when the flow of water in the glacier has been slower and so allowing deposits to build up. The eskers can actually be found going up over hills, the force of melting water pushing the river along and uphill against gravity, this is called hydrostatic flow.