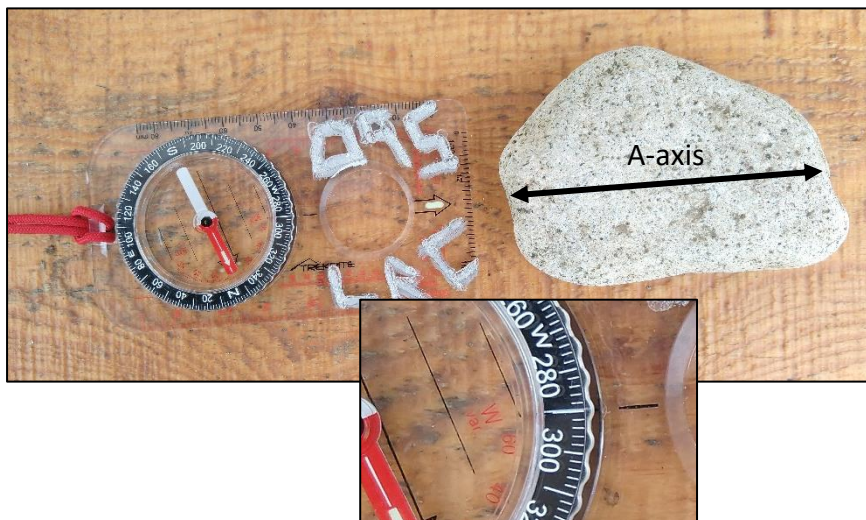


## Sediment Analysis of Two Valleys

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. Thus, by measuring the A-axis orientation of pebbles found in sediment deposits, and comparing this with the orientation (the direction in which it runs) of the valley where they have been deposited, it is possible to gauge whether the deposit is likely to be of predominantly fluvial or glacial origin.

To conduct this analysis, first find an exposed sediment deposit – these can sometimes be found on the edge of a valley, on eroded river cliffs, or in glacial moraines. Select a pebble which is protruding from the deposit, and remove it altogether, being careful to keep it in line with the direction in which it lay within the deposit. Identify the pebble's A-axis. Lay a compass on top of the pebble, pointing in the same direction as the A-axis. Rotate the compass's dial so that the orienting north arrow is in line with the north indicated by the magnetic needle – you are simply aligning north with north, as you would when taking a bearing. You can now remove the compass from the rock and read the three-digit A-axis orientation off from the index line of the compass. Repeat this process until you have taken the orientation of twenty pebbles. You will speed up considerably with a bit of practise! Finally, you can also make a few additional notes about the nature of your deposit – for instance, you could note whether there is any evidence of sorting or stratification amongst the pebbles, and comment on their relative angularity and sphericity.

At the Lochranza Centre, we tend to study deposits from two valleys – Glen Easan and Glen Rosa. Glaciers were the key influence in the formation of Glen Rosa, so pebble A-axis orientation would generally be expected to be in line with the west-northwest to east-southeast direction of the valley. Glen Easan is more complicated, however, having been formed by both glacial and fluvial processes, so the orientation of its pebbles' A-axes may not follow the valley trend as consistently as in Glen Rosa.



Here, the compass is pointing in the same direction as the pebble's A-axis. North has been aligned with north on the compass, and the enlarged section of the image shows that this pebble's orientation is 290°, i.e. the pebble is oriented in a west-northwest to east-southeast direction.

<b>Valley One</b>	
Pebble Number	A-axis Orientation (°)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

Additional Notes:

<b>Valley Two</b>	
Pebble Number	A-axis Orientation (°)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

Additional Notes: