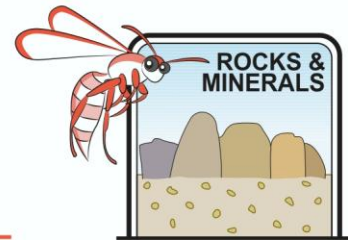


Glaciation (Ice Erosion) – Homework Notes



If you were standing where Mingenew is located in the Central Midlands of Western Australia between 280 and 320 million years you would be under an ice cap five kilometres thick. We know this because there are “drop rocks” found in local fields. They are many kilometres from their outcrop and were deposited when the glacier melted. They have classic plucked ends, polished scored soles and lie in classically unsorted sediments. Indeed glacial erosion helped create the flattened shield like surface of much of this state.

Glaciers are rivers of ice that move slowly downhill plucking rocks from the surrounding landscape grinding them into flour. Glaciers flow because pressure from overlying ice melts the ice at the bottom. Rivers flow at the bottom of glaciers.

Glaciers presently cover ten per cent of the Earth’s surface. In the distant past however it is suggested that almost the entire planet was covered in ice during the late Proterozoic. This was one of the earliest mass extinctions and is known as “Snowball Earth”.

Glaciers freeze around rock debris and employ these to grind their way over the land leaving characteristic U shaped valleys. Scratches or striations are left in country rock indicating the direction of movement. These scratches have been used as evidence to support the theory that the continents of Australia, South Africa, South America, India and Antarctica were once part of a supercontinent called Gondwana. Striations cut into rock in all these continents can be traced back to movement out from a common ice sheet when they were joined together.

Pressure from a great weight of ice above causes the base ice to melt which aids movement. Teachers can demonstrate this by cutting an ice block and pulling a length of wire across it using gloves. Sneaky teachers can place 5c pieces in the cuts and let them freeze over again!

This activity is easiest to be carried out as homework.

Materials per student or group

- Plastic or paper cup
- Cling wrap or equivalent
- Water
- Gravel or road metal
- Access to freezer
- Soft wooden boards, pine offcuts or pallet wood (cardboard will suffice but becomes soggy very quickly).
- Camera or sketch pad

1. Half fill the cup with water and add the gravel
2. Tightly cover and seal the cup with cling wrap
3. Up-end the cup onto a saucer or plate and place in the freezer
4. Next day remove the plastic wrap and drag your glacier over the soft wood surface. Remember to only move it in one direction.
5. Take a photograph or sketch what has changed.