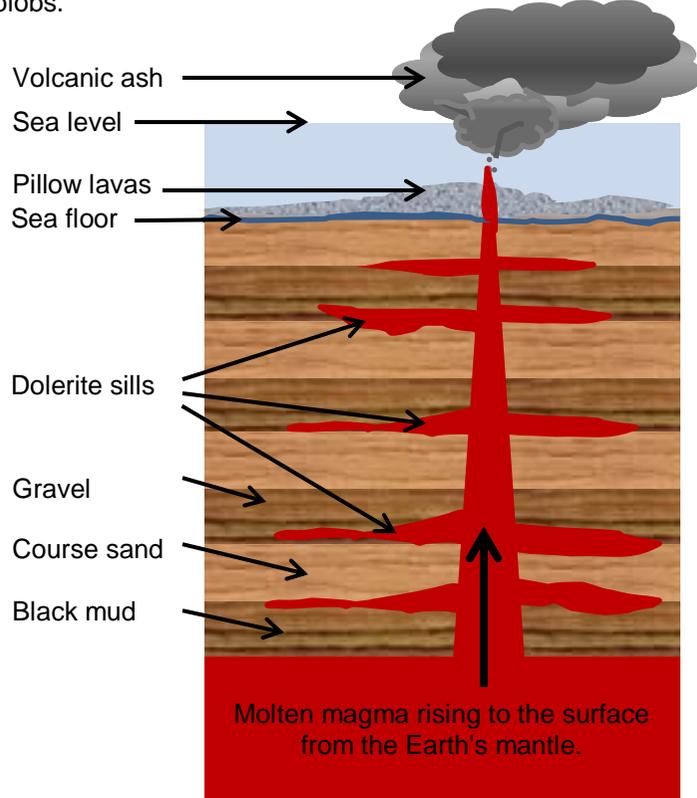


THE ROCK STORY

Since early in the Earth's history, tectonic plates have moved around the globe carrying continents which collide, then split apart. They move at the rate a finger-nail grows.

Our story begins over 600 million years ago. Powerful currents were depositing coarse sands, gravels and limy black mud in deep-water basins.

Then the Earth's crust stretched, causing the mantle beneath to melt. Molten magma was forced between the layers of sediment, forming 'sills' of dolerite. Ash exploded from underwater volcanoes. Lava extruded in pillow-like blobs.



The layers were very deeply buried and turned into solid rock.

Around 470 million years ago, continental plates collided. Scotland was squeezed by pressure from NW and SE. This formed the Caledonian mountain belt and the NE-SW linear features of Argyll.

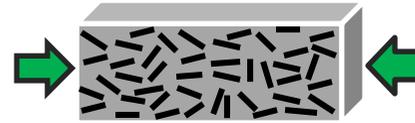
The stress of collision allowed the solid rock to 'flow' into tight complex folds.

At great depth, extreme heat and pressure recrystallized the minerals in the rocks. This is known as metamorphism.

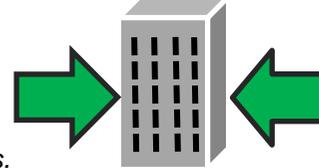
Sandstone became hard **quartzite** (known locally as 'grit'). Mudstone turned into softer **slate** and **phyllite** (silvery-grey) and limestone to **metalmestone**.

The sills altered to hard **metadolerite**, and sometimes **chlorite schist**, which is able to be split like slate.

Layers of rock start to compress.



With more pressure platy minerals in schist and slate lie parallel to each other and develop layering. These rocks can then be split along planes of weakness.



Eventually the mountains wore down. The bands of rock eroded differently. Harder quartzites, metadolerite and green/black lavas are now the knaps. The softer bands of slate and limestone are the dales and lochans. In some places the sea has invaded, leaving fingers of land and small islands parallel to the coast.

Diagram shows rock layers folded deep in Earth's crust.



After millions of years of erosion, bands of hard and soft rocks form Knapdale's corrugated landscape of today.



(All diagrams have been simplified for clarity.)

Later extension of the Earth's crust caused fractures, like the Crinan fault, which defines Knapdale's northern edge.

About 20,000 years ago Scotland was covered with one mile-thick moving ice, scouring the rock like sandpaper and deepening out glens and lochs with melt water. The weight of all the ice depressed the land. At the end of the glacial period the ice melted and this huge load was removed. Knapdale rose back up. Sea level was lowered, exposing ancient beaches and sea cliffs we see today.

THE PLANT AND ANIMAL STORY

When the ice had gone, the grasses returned. Different soil types developed from the bands of rock.

- **quartzite** is mainly silica and therefore sterile. It does not decompose to soil.
- **metadolerite** and **Tayvallich volcanics** contain extra minerals so are home to plants like liverworts, mosses and ferns.
- **limestone** reduces acidity and breaks down nutrients to make more fertile soil.



A wall at Dun Mhuirich, showing black metadolerite (with ferns growing in it) on top of pale sterile grit.

Native woodlands of ancient birch, hazel and oak are secure on the steep ridges. They give shelter to red squirrels, many bird species and rare butterflies.

Beavers used this woodland cover after the climate warmed around 6,000 years ago. They later became extinct, but now are once more making this special place their home.