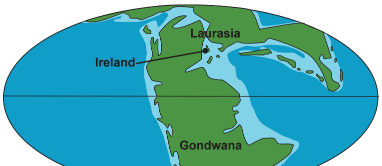
HOW TALL ARE YOU?

Travel through Ireland's geological past as you grow!

The crust of the Earth is made up of many rigid plates, some of which form the continents and others form the rocks beneath the oceans. The edges of the plates are often areas where volcanoes and earthquakes occur. These plates are always moving slowly, caused by heat currents from the mantle below the crust. This process is called 'plate tectonics'.

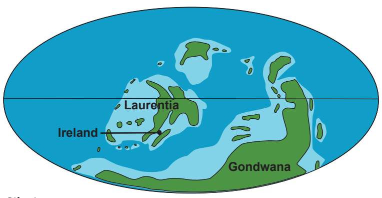
Sometimes continents collide and produce mountains and larger continents while sometimes oceanic plates get pushed beneath plates and eventually melt. New oceanic crust is formed along the mid-oceanic ridges. Over time the positions and sizes of continents have changed, and in the last 500 million years Ireland has moved northwards from below the Equator to its present position. The maps below show the distribution of land and oceans at four times in the past.

Tertiary
60 million years ago the continents and oceans had almost reached their present-day distribution. The North Atlantic Ocean was opening with Europe moving away from Greenland. Volcanic activity will soon produce the Antrim basalts and the Giant's Causeway and Iceland. India, which moved northwards throughout the Tertiary, has nearly collided with Asia, and Australia has just broken away from Antarctica.



Jurassic
180 million years ago one large continent existed called Pangaea following the merger of Laurasia and Gondwana. However during the Jurassic the Atlantic Ocean began to open and Gondwana and Laurasia started to drift apart. At this time Ireland was situated north of the Equator. Some of Ireland was land while other parts were submerged beneath a shallow sea in which lived various marine reptiles that included ichthyosaurs and plesiosaurs.

Lower Carboniferous
350 million years ago Ireland was south of the Equator, submerged under a warm sea which contained many reefs and a large number of animals such as brachiopods, bryozoans, corals and gastropods. The sea was close to a large content called Laurussia that was made up of modern-day North America, Greenland, and Europe. The large continent Gondwana which was to the south was separated from Laurussia by a shallow ocean.



Silurian
430 million years ago a large continent called Gondwana was situated largely in the southern hemisphere. It was made up of present-day southern Europe, Afrca, Antarctica, India, Australia and South America. A shallow ocean called Iapetus separated Gondwana from another continental area called Laurentia that included Scandinavia and North America. The area that is now Ireland was a shallow sea that separated between parts of Laurentia.

GEOSCHOL Geology for Schools in Ireland
www.geoschol.com
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Maps adapted from those by C.R. Scotese, PALEOMAP Project (www.scotese.com).

ERA | PERIOD | AGE in millions of years

Cenozoic

Quaternary (1) In the last two million years during the Ice Age the climate has been either very cold with ice sheets and glaciers, or warmer when Mammoth, Giant Irish Deer and Brown Bears roamed the countryside. The last ice melted 10,000 years ago and man arrived in Ireland 5,500 years ago. — 1.8

Tertiary Deposition of clay occured around Lough Neagh. Climate warmer than today. Volcanic activity in north-east Ireland produces lava that forms the Antrim Plateau and cools to form the Giant's Causeway. — 65

Mesozoic

Cretaceous Dinosaurs become extinct at the end of the Cretaceous when a large meteorite hits the Earth. Chalk, a pure white limestone was deposited in warm seas. It is now preserved in north-east Ireland and with a small patch in Kerry. There may have been dinosaurs in Ireland at this time, but we have little evidence of this as much of the Cretaceous rocks have since been eroded away. — 146

Jurassic (2) Ireland was covered by shallow seas in which the marine reptiles ichthyosaurs and plesiosaurs lived, together with bony fishes and ammonites. Muds and sandstones were deposited. Today some Jurassic rocks can be seen along the Antrim coast; elsewhere they have been eroded away. — 200

Triassic Ireland was a hot, desert-like continent in which sandstones (New Red Sandstone) was deposited. Salt deposits formed in shallow salty lakes. Today Triassic rocks occur near Kingscourt in Co. Cavan where the salt mineral gypsum is quarried for plasterboard and cement. — 250

Palaeozoic

Permian During the Permian the seas retreated and Ireland was land. Most Permian rocks are now eroded away. When Africa collided with Europe the crust was crumpled, and valleys formed in Kerry, Cork, and Waterford, running from east to west. — 300

Carboniferous (3) In the Upper Carboniferous the sea was replaced by swamps containing forests of tree-ferns and cycads where amphibians and insects lived. These plants eventually formed the coal once mined at Arigna, Co. Leitrim, Castlecomer, Co. Kilkenny, and Kanturk, Co. Cork. At the beginning of the Lower Carboniferous a tropical sea slowly moved northwards and covered the land. (4) Reefs and limestone formed in this sea, and many animals were preserved as fossils. Limestone now covers over 50% of Ireland. — 360

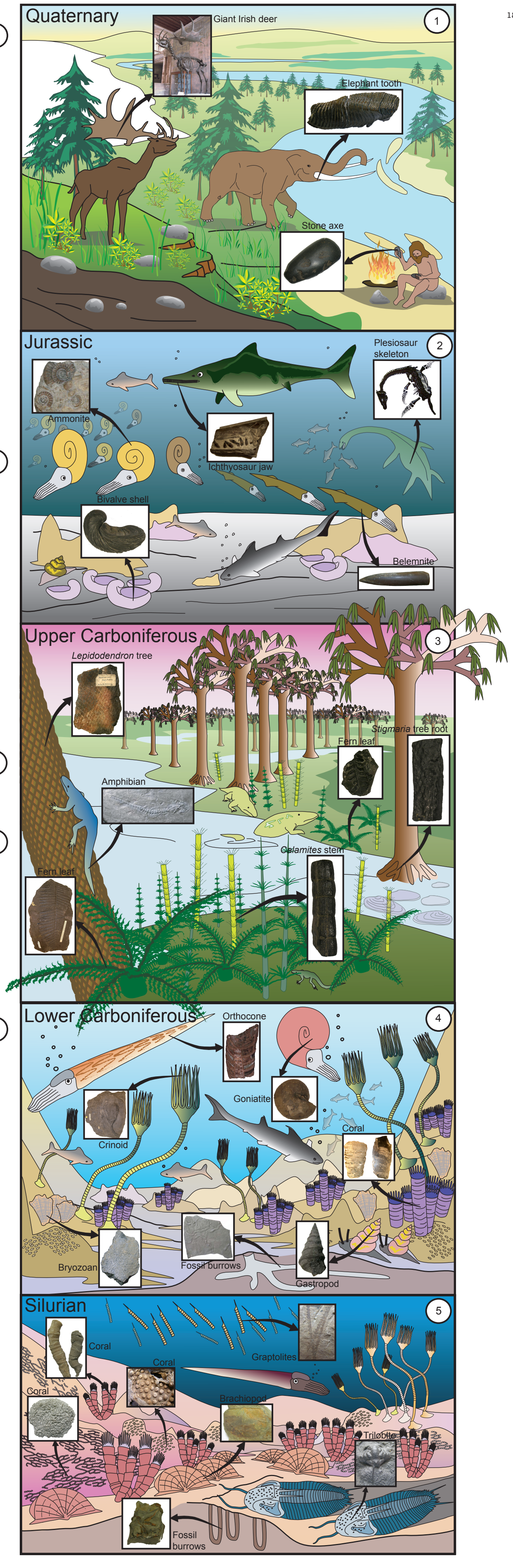
Devonian Ireland was part of a large dry desert continent. Large rivers flowed through it from north to south and drained into a shallow sea in the south of Ireland. Sand and coarse pebbly sediments formed the Old Red Sandstone, best seen in Counties Cork and Kerry. Fish dominated the oceans. Some mountain-building activity produced folds and faults. — 415

Silurian (5) Volcanic islands erupted lavas and volcanic ash near Dingle, Co. Kerry. Shallow seas contained corals, brachiopods, and trilobites, and plants grew on dry land for the first time. The Leinster granite was injected into the crust. — 450

Ordovician Slowly the Iapetus Ocean closed as the contents moved closer together. Small volcanic islands appeared in Counties Mayo, Longford, Down, Waterford and Dublin and lavas and volcanic ash were dumped into the shallower sea, together with mud and sand from the land. Some limestone formed in this sea which can now be found in Mayo, Wexford and Waterford. — 490

Cambrian Two large continents were separated by an ocean called Iapetus and what is now Ireland was under this closing sea. Fine-grained sediments were deposited and can now be found at Bray Head and Howth as sandstones and slates. Some of these rocks include trace fossils (burrows and trails) and include Oldhamia which help date the rocks. — 550

Precambrian
This was a long time period when much of the Earth's surface was unstable. Rocks such as limestone and sandstone were deposited and later these were altered by metamorphism to marble, quartzite and schist. Various igneous rocks were intruded. The oldest rocks in Ireland are 1,700 million years old and are found on Inishtrahull Island, Co. Donegal. — 4500



Quaternary
1
Giant Irish deer
Elephant tooth
Stone axe
Jurassic
2
Plesiosaur skeleton
Ammonite
Ichthyosaur jaw
Bivalve shell
Belemnite
Upper Carboniferous
3
Lepidodendron tree
Stigmaria tree root
Fern leaf
Amphibian
Calamites stem
Fern leaf
Lower Carboniferous
4
Orthocone
Goniatite
Crinoid
Coral
Bryozoan
Fossil burrows
Gastropod
Silurian
5
Coral
Graptolites
Coral
Coral
Brachiopod
Trilobite
Fossil burrows