TOUCHSTONES
LEARNING

ROCKS
MINERALS
& Fossils

Discovery Box

LIMESTONE

Limestone is a type of sedimentary rock which is the main source of the material lime and found all over the world.

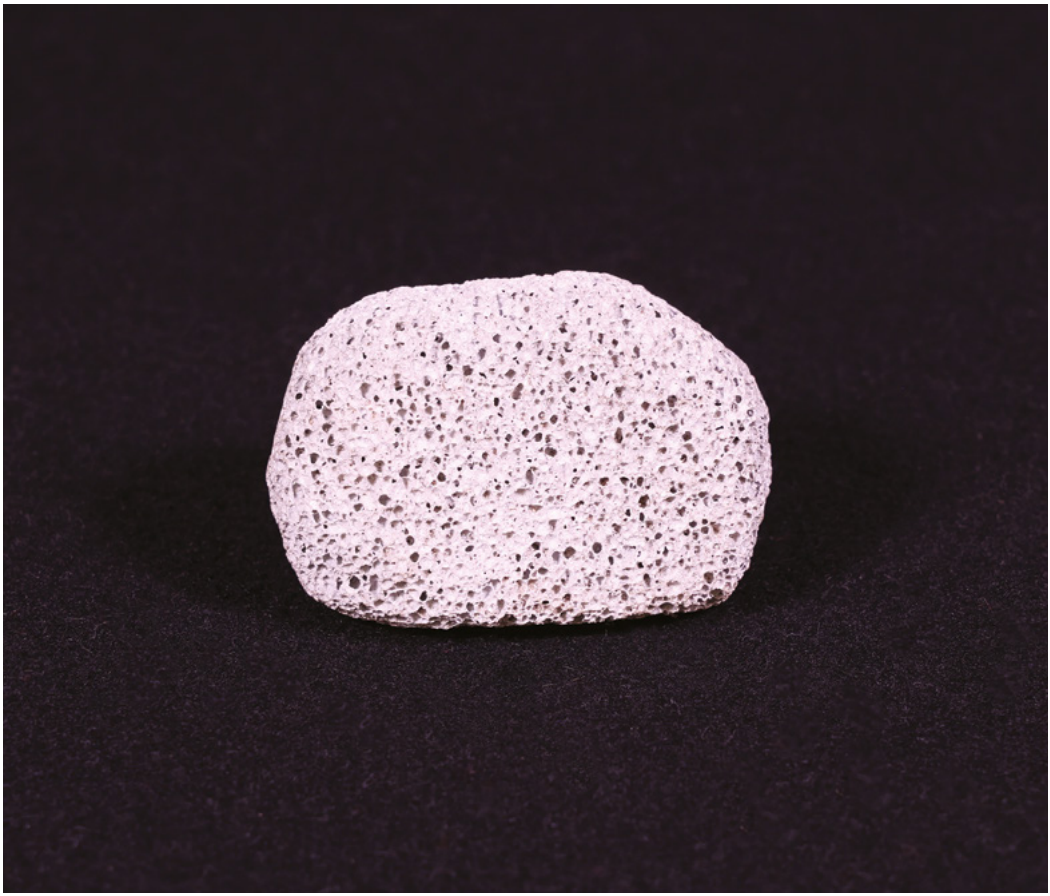
It often contains parts of animal shells and fossils. Limestone forms over millions of years as layers of shells and mud harden. It can contain different materials and comes in various colours. It is versatile and can be used for various purposes such as building material for construction; in products like paper, plastic, and paint; soil conditioner; and decorative additions to rock gardens.

Mols hardness scale – 3

IRON ORE

Iron ore is a type of rock or mineral from which metallic iron can be extracted.

Iron has been used by humans for thousands of years and has played a critical role in the development of human civilization. It was used by ancient people to make arrow heads and other weapons as well as in farming tools. Now 98% of the world's iron ore is made into steel, it is one of the most abundant elements on Earth, making up about 5% of the Earth's crust.. The word "iron" is possibly derived from earlier words meaning "holy metal", as iron was used to make swords during the Crusades. The leading iron ore-producing countries in the world are Australia, Brazil, China, India, Russia, and South Africa.



PUMICE

Pumice is an igneous rock, formed by magma and lava.

It is created when super-heated, highly pressurized rock is rapidly ejected from a volcano. Pumice is a very lightweight, porous and abrasive material and it has been used for centuries in the construction and beauty industry, as well as in early medicine. It is also used as an abrasive, especially in polishes, pencil erasers, and the production of stone-washed jeans. Pumice was also used in the early book-making industry to prepare parchment paper and leather bindings. It is also used to filter water and help soak up chemical spills.

Mols hardness scale – 6

SANDSTONE

Sandstone is a sedimentary rock that occurs in many different colours, depending on the mineral mix.

Sandstone is a sedimentary rock that occurs in many different colours, depending on the mineral mix. It is made of compacted sand, which is small grains of rocks and minerals such as quartz and feldspar. Sandstone is porous and therefore allows it to act as a natural filter, removing contaminants from flowing water.

Sandstone, which is resistant to weathering, is used for building in many countries and has been used in construction from ancient times. This versatile rock is exceptional at preserving animal tracks and footprints, offering invaluable insights into the behaviour of prehistoric creatures. Sandstone's unique properties enable fossils to retain detailed features, such as skin impressions.

Mols hardness scale – 6-7

SLATE

Slate is metamorphic rock that was formed 400 million to 550 million years ago.

It is mostly made of clay but the clay can change to mica under extreme degrees of pressure. The colour of slate is largely determined by the amount of iron it contains, but it is normally a shade of grey. Slate has been used for roofing for over one thousand years as it is resistant to water and also to fire.

Mols hardness scale – 2.5-4

VESUVIUS LAVA

When lava cools it becomes an igneous rock.

One form of this is Basalt. More than 90% of all volcanic rock on Earth is basalt. Basalt is also an important rock type on other planetary bodies in the Solar System. For example, the bulk of Venus is covered by basaltic; it is found on the moon; and is a common rock on the surface of Mars. This lava example was found in Italy near the Vesuvius and was gifted to Touchstones in the 1980's—we are not actually sure how old it is!

Mols hardness scale – 6

BLUE JOHN (FLUOSPAR)

Blue John (also known as Derbyshire Spar) is a semi-precious mineral, a rare form of fluorite with bands of a purple-blue or yellowish colour.

In the United Kingdom, it is found only at Blue John Cavern and Treak Cliff Cavern at Castleton in Derbyshire. During the 19th century, it was mined for its ornamental value, and mining continues today on a small scale.

Mols hardness scale – 4 – 4.5

CALCITE

Calcite is a common occurring mineral and is a component of limestone.

It comes in many different shapes and colours, making it a popular choice among collectors. Calcite has more different shapes than any other mineral, with over 300 varieties. It is commonly used to make cement.

Mols hardness scale – 3

PYRITE

The mineral pyrite or iron pyrite, also known as fool's gold, was used in the 16th and 17th centuries as a source of ignition in early firearms.

Pyrite is still used with flintstone and a form of tinder made of stringybark by the Kaurna people of South Australia, as a traditional method of starting fires. Scientists are currently exploring whether pyrite can be used in the production of solar energy. Although pyrite deposits are widespread notable amounts are in America , Spain and elsewhere in the Iberian Peninsula.

Mols hardness scale – 6 – 6.5

QUARTZ

Quartz is the second most commonly found mineral on Earth.

It can conduct electricity under pressure. Quartz is colourless in its natural state, but different elements can give it various colours. Quartz is often used to make jewellery but also used to coat drilling equipment. It is often used in a sand form during metal smelting processes as it is very resistant to heat.

Mols hardness scale – 7

AMYTHYST

Amethyst is a semiprecious mineral stone — a violet variety of quartz which is often used in jewellery.

Amethysts are found in geodes, which look like ugly rocks on the outside. Cracked open, a geode reveals sparkling raw amethyst crystals that range in colour from light mauve to deep purple. At one time, you could only wear amethyst jewellery if you were royalty. High-quality amethyst can be found in Siberia, Sri Lanka, Brazil, Uruguay, and the Far East.

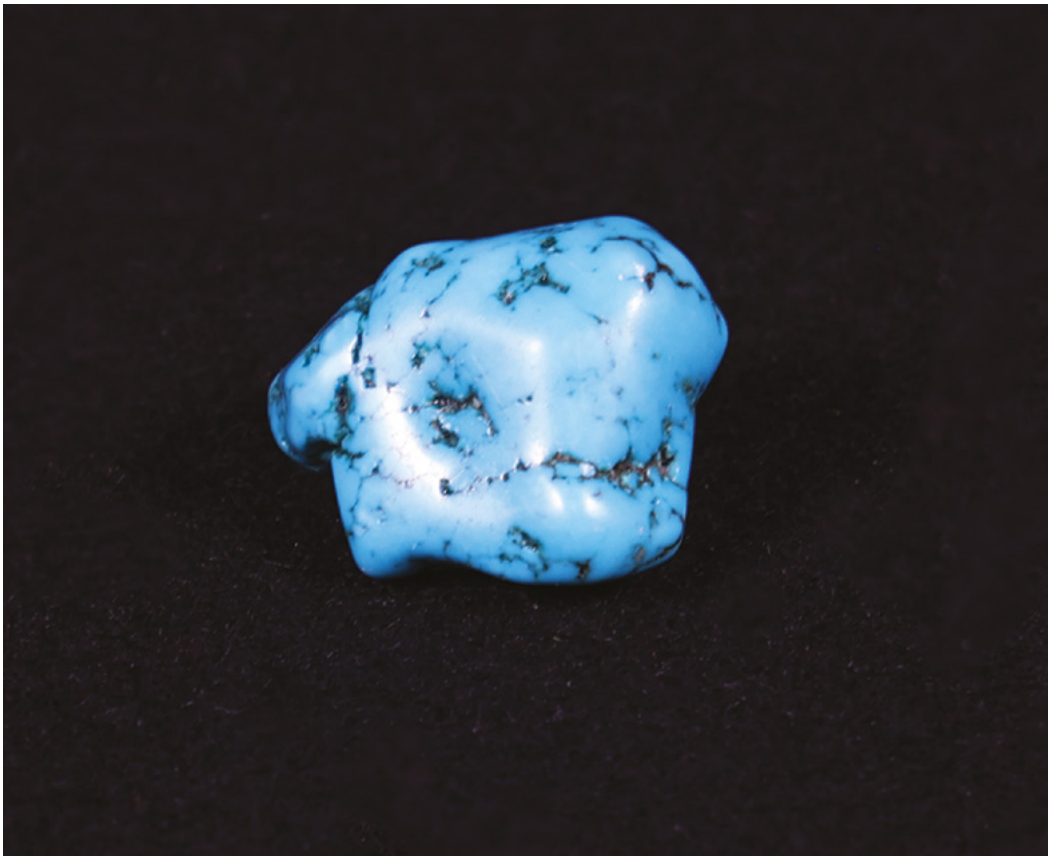
Mols hardness scale – 7

TURQUOISE

Turquoise is a mineral that gets its blue and green colours from the presence of copper.

It is often used in polished jewellery all over the world. The name ‘turquoise’ is derived from the French word meaning ‘Turkish stone,’ as it was commonly traded through Turkish markets. Turquoise forms best in an arid climate. Most of the world’s turquoise is currently produced in the south-western United States, China, Chile, Egypt, Iran, and Mexico.

Mols hardness scale – 5 - 6



FLUORITE

Fluorite is a naturally occurring mineral that can glow under UV lights.

Pure fluorite is colourless and transparent, but impurities usually make it a colourful mineral and the stones are usually used ornamentally and in jewellery. Fluorite actually bends light less than standard glass, making it an ideal component of lenses. It has been used for a few hundred years, in the manufacture of microscopes.

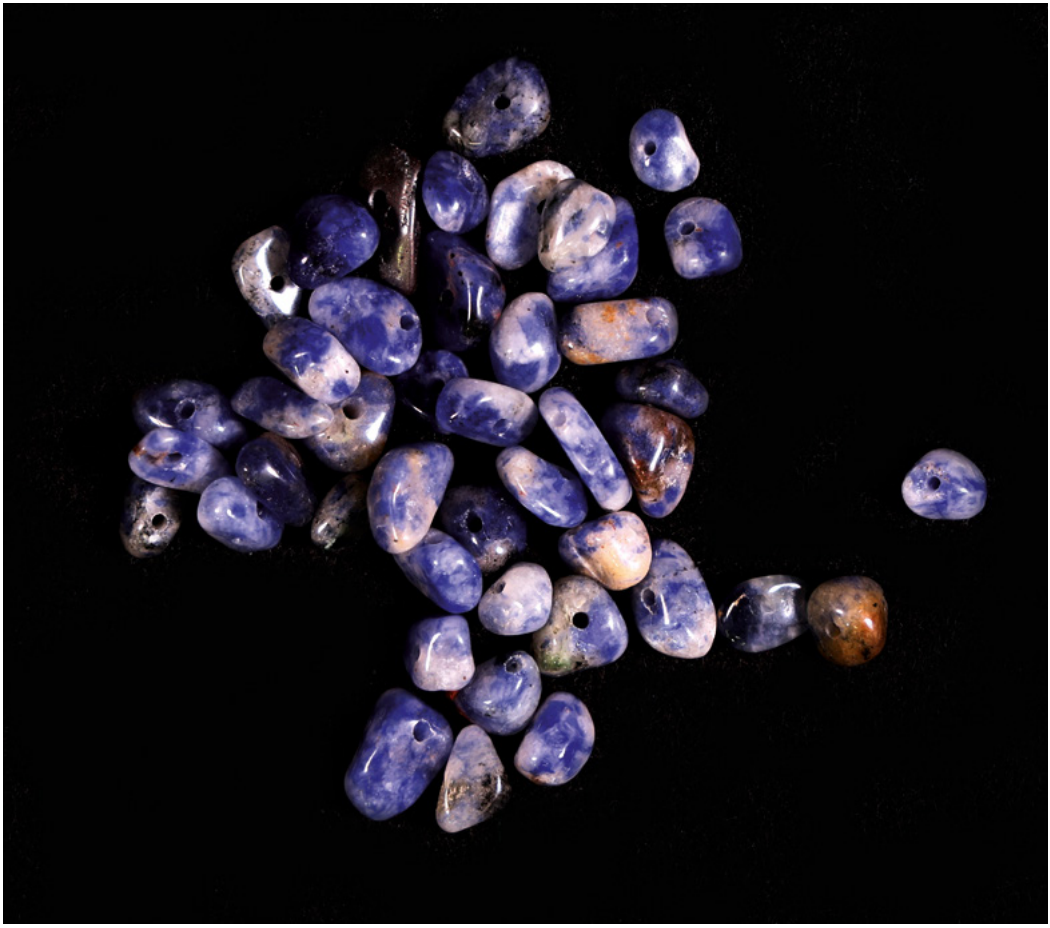
Mols hardness scale – 4

SODALITE

Sodalite is a rare blue mineral which gets its name from the large amount of sodium contained in it.

First discovered in Greenland, Sodalite can be found in many parts of the world including Afghanistan, Brazil, and Canada. Sodalite has been used to create colourful jewellery. It has also been cut into ornamental figurines.

Mols hardness scale – 5 - 5.6



HEMATITE

Hematite is a naturally occurring mineral that is usually black, silver-grey, brown or red colours.

It is mined and slightly magnetic. Hematite also conducts electricity and is used in medical equipment, shipping indus-tries and coal production. Due to its high density, hematite is an effective barrier against X-rays and is therefore used in radiation shielding. This mineral is also found on Mars.

Mols hardness scale – 5.5

GRANITE

Granite is an igneous rock that formed during the early geologic periods, making it the oldest rock on the planet.

It is radioactive in nature, but the uranium count is not harmful to humans. Granite is made up of many minerals, such as quartz, feldspar, mica, and hornblende. It is used in the construction of buildings and as a pavement material because it is extremely durable, permeable and requires little maintenance. The Great Pyramid of Giza contains a huge granite sarcophagus fashioned of “Red Aswan Granite”

Mols hardness scale – 7

COAL

Coal is a black or brownish-black sedimentary rock, formed by straight layers of rock (strata) called coal seams.

It is mostly made of carbon and is flammable. Coal is a type of fossil fuel, formed when dead plant matter decays into peat, which is converted into coal by the heat and pressure of deep burial over millions of years. Vast deposits of coal originate in former wetlands called coal forests that covered much of the Earth's tropical land areas during the late Carboniferous and Permian times.

Mols hardness scale – 0.6 – 1.5

AMMONITES

Ammonites were ocean-dwelling molluscs living in the Jurassic Period.

Fossils of them are found all around the world, sometimes in very large concentrations. Ammonites were born with tiny shells and, as they grew, they built new chambers onto it. They would move their entire body into a new chamber and seal off their old and now too-small living quarters with walls known as septa.

DUNBARELLA

A Dunbarella was a thin-shelled bivalve (two hinged shell) creature which probably swam through the sea like present day scallops and lived on the sea bed. This fossil was found in Rochdale probably in the late 19th century by miners.

GRYPHAEA (DEVILS TOENAIL)

Gryphaea lived in large colonies in warm shallow seas, on the sea-floor with their shells half-buried in the mud.

Their shells consist of two parts: a large, hooked lower shell and a flatter, smaller shell on top—they were a type of oyster.

These types of fossil are particularly common in many parts of Britain, and in the 17th and 18th centuries, many people thought that carrying one around would help to cure arthritis.

FOSSILISED LYCOPOD TREE ROOT

The Paleozoic swamps had tree-like lycopsids that grew between 30 and 50 metres in height.

These lycopsid trees were anchored by an extensive network of root structures called Stigmaria. Lycopods had five or more main roots, which spread out horizontally from the trunk. Horizontal rather than vertical rooting was likely an adaptation to the wet, swampy habitat in which lycopod trees thrived in.

This fossil was found in Newhey, Rochdale.

FOSSILISED CLAM SHELL

This is a marine fossil with the scientific name ‘Inoceramus’.

Inoceramids are bivalves related to living clams and mussels and are one of the most common marine fossils of the Late Cretaceous Period.

TRILOBITE

There are over 20,000 species of Trilobite currently known.

The biggest species (Isotelus rex) was just over 71cm long, while the smallest measured less than a millimeter from end to end. Some have defensive spines, while others have smooth, rounded shells. Some trilobites had disproportionately large eyes, despite many deep-sea species being blind. At one point Trilobites were the most common and diverse animals on the planet.

LYCOPHORIA NUCELLA

This shelled creature has mainly been uncovered around the shores of Estonia and St Petersburg in Russia.

Studying these type of fossils has been useful in showing climate changes during the Paleozoic period as they filtered water whilst feeding. One of it's modern-day relations (Coptothyrus adamsi) is currently used to measure environmental conditions around oil terminals being built on the shore of the Sea of Japan.

Lycophoria nucella are often known as "lamp shells" and thought to be used by the Romans to contain oil as a way of lighting rooms.

BELEMNITE

Belemnites were marine animals belonging to the phylum mollusca family.

Their closest living relatives are squid and cuttlefish. They had a squid-like body but, unlike modern squid, they had a hard internal skeleton. Belemnites lived during the Jurassic and Cretaceous periods; together, these represent a time interval of about 135 million years. Belemnites, in life, are thought to have had 10 hooked arms and a pair of fins on the guard. The chitinous hooks were usually no bigger than 5 mm, though a Belemnite could have had between 100 and 800 hooks in total, using them to stab and hold onto prey.

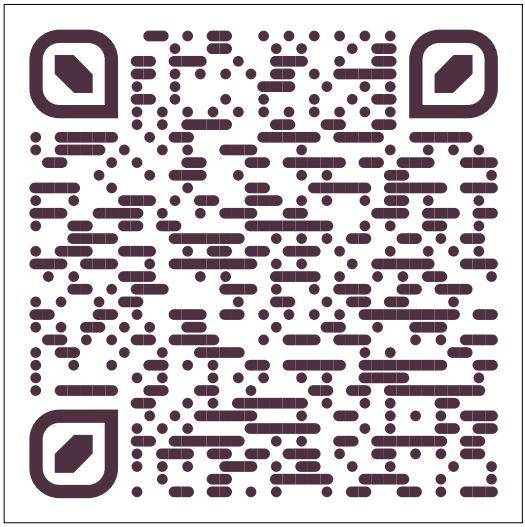
UNKNOWN FOSSIL

This fossil was found in the Sparth area of Rochdale.

It was found by a Victorian miner who came across it whilst they were working. It was donated to the museum many years ago, but all the paperwork has been lost and we don't really know what it is. Can you help us?

THANK YOU FOR BORROWING THIS BOX

We hope you enjoy using it in your classroom!



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TOUCHSTONES ROCHDALE

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