Educator resources

FOSSILS

This package has been designed to give a brief introduction into the most common types of fossils found along the Yorkshire coastline.

For your use we have attached some related further topics to allow for you to expand on any specific areas or to help tailor any learning or activities to the aptitude of the student.

We have also included suggested subjects which can be linked to this topic.

Topics within the key stages which relate to this topic:

Key stage 1/2

Year 2

Living things and their habitats

- Explore and compare the differences between things that are living, dead, and things that have never been alive
- Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food (fossil food chain)

Animals, including humans

- Notice that animals, including humans, have offspring which grow into adults (descendants of fossils)

Year 3

Animals, including humans

- Identify that humans and some other animals have skeletons and muscles for support, protection and movement (fossils can be remains of skeletons)

Rocks

- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
- Describe in simple terms how fossils are formed when things that have lived are trapped within rock
- Recognise that soils are made from rocks and organic matter

Year 4

Living things and their habitats – classification of fossil types and the extinction of dinosaurs

- Recognise that living things can be grouped in a variety of ways
- Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment
- Recognise that environments can change and that this can sometimes pose dangers to living thing

Animals, including humans

- Construct and interpret a variety of food chains, identifying producers, predators and prey (the food chain of the ancient creatures which became fossils)

Year 6

Living things and their habitats – in relation to fossils

- Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals
- Give reasons for classifying plants and animals based on specific characteristics.

Evolution and inheritance

- Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Geography – Place Knowledge – in relation to Yorkshire

- Understand geographical similarities and differences through the human and physical geography of a small area of the UK, and of a small area of a non-European country
- Use basic geographical vocabulary to identify key physical features such as beach/cliff/coast/forest/hill/mountain/sea/ocean/river/soil/valley/vegetation/season/weather
- Use basic geographical vocabulary to identify key human features such as city/town/village/factory/farm/house/office/port/harbour/shop

Human and physical geography – in relation to Yorkshire

- Describe and understand key aspects of physical geography, including: climate zones/ biomes and vegetation belts/ rivers/mountains/ volcanoes and earthquakes/ and the water cycle
- Describe and understand key aspects of human geography, including: types of settlement and land use, economic activity
  including trade links, and the distribution of natural resources including energy, food, minerals and water

English

- Introducing new terminology (see following glossary) associated with palaeontology and ecology
- Read words of more than one syllable that contain taught GPC's

Maths -Measurements

- Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels

Maths – Ratio and proportion

- Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts
- Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison
- Solve problems involving similar shapes where the scale factor is known or can be found
- Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

Key stage 3/4

Relationships in an ecosystem

- The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops
- The importance of plant reproduction through insect pollination in human food security
- How organisms affect, and are affected by, their environment, including the accumulation of toxic materials

Genetics and evolution

- Heredity as the process by which genetic information is transmitted from one generation to the next
- A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model
- Differences between species
- The variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation
- The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection
- Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction
- The importance of maintaining biodiversity and the use of gene banks to preserve hereditary material

Earth and atmosphere

- The composition of the Earth
- The structure of the Earth
- The rock cycle and the formation of igneous, sedimentary and metamorphic rocks

Biology – in relation to fossils and past environments

- Life processes depend on molecules whose structure is related to their function
- The fundamental units of living organisms are cells, which may be part of highly adapted structures including tissues, organs and organ systems, enabling life processes to be performed more effectively
- Living organisms may form populations of single species, communities of many species

and ecosystems, interacting with each other, with the environment and with humans in many different ways
- Living organisms are interdependent and show adaptations to their environment
- Life on Earth is dependent on photosynthesis in which green plants and algae trap light from the Sun to fix carbon dioxide and combine it with hydrogen from water to make organic compounds and oxygen
- organic compounds are used as fuels in cellular respiration to allow the other chemical reactions necessary for life
- The chemicals in ecosystems are continually cycling through the natural world
- The characteristics of a living organism are influenced by its genome and its interaction with the environment
- Evolution occurs by the process of natural selection and accounts both for biodiversity and how organisms are all related to varying degrees.

Ecosystems

- Levels of organisation within an ecosystem
- Some abiotic and biotic factors which affect communities; the importance of interactions between organisms in a community
- How materials cycle through abiotic and biotic components of ecosystems
- The role of microorganisms (decomposers) in the cycling of materials through an ecosystem
- Organisms are interdependent and are adapted to their environment
- The importance of biodiversity
- Methods of identifying species and measuring distribution, frequency and abundance of species within a habitat

Evolution, inheritance and variation

- The process of natural selection leading to evolution
- The evidence for evolution
- Developments in biology affecting classification

Earth and atmospheric science

- Evidence for composition and evolution of the Earth's atmosphere since its formation
- Evidence, and uncertainties in evidence, for additional anthropogenic causes of climate change
- Potential effects of, and mitigation of, increased levels of carbon dioxide and methane on the Earth's climate
- Common atmospheric pollutants: sulphur dioxide, oxides of nitrogen, particulates and their sources
- The Earth's water resources and obtaining potable water

Human and physical geography – in relation to Yorkshire

- Physical geography relating to geological timescale and plate tectonics; rocks, weathering and soils; weather and climate, including how the climate has changed since the last ice age; and glaciation, hydrology and coasts

English

- Pupils should continue to develop their knowledge of and skills in writing, refining their drafting skills and developing resilience to write at length. They should be taught to write formal and academic essays as well as writing imaginatively. They should be taught to write for a variety of purposes and audiences across a range of contexts. This requires an increasingly wide knowledge of vocabulary and grammar

Citizenship – in relation to Yorkshire and SSI/SAC/MPA of Flamborough

- The roles played by public institutions and voluntary groups in society, and the ways in which citizens work together to improve their communities, including opportunities to participate in school-based activities
- Local, regional and international governance and the United Kingdom's relations with the rest of Europe, the Commonwealth, the United Nations and the wider world

Glossary

Ammonite = a fossil with intricately frilled suture lines, typically found in the Jurassic and Cretaceous periods

Belemnite = a bullet shaped fossil, typically found in deposits in the Jurassic and Cretaceous periods

Biped = an animal that uses two legs for walking

Cephalopod = a large active predatory mollusc, such as an octopus and squid

Dinosaur = the term used describe creatures which were made extinct. The term is derived from Ancient Greek, *denios* meaning 'terrible or fearfully great' and *sauros* meaning 'lizard or reptile'

Megalosaurus = a large carnivorous bipedal dinosaur of the mid Jurassic period, whose remains have only been found in England

Organism = an individual animal, plant or single-celled life form

Palaeontology = the scientific study of fossilised animals and plants

Preserved = maintained or conserved in its original or existing state

Trace fossils = a fossil of a foot print, trail, burrow or another trace of the animal rather than the actual animal itself

Taking the subject further…

We have a range of printable resources on our website to assist you in your teaching and learning. Categories include:

- Colouring sheets
- Crafts
- Spotter ID sheets
- Quizzes
- Activity booklets

The activities have been developed to allow participants to be creative, allowing pupils to *produce creative work, exploring their ideas and recording their experiences* in-keeping with national curriculum guidelines.

There is also the opportunity to improve computer skills through research for completing the activity booklets.

To link specifically with this topic, we would recommend:

- Ammonite colouring sheet
- The Sea and Me activity booklet - exploring what the sea means to you and what you can do to help protect it
- Peg shark for creative students

The resources can be found following the link here:

https://www.ywt.org.uk/living-seas-centre/printables