

Ireland's Fossil Heritage

Primary School Workshops

Lesson Plans



Introduction

Ireland's Fossil Heritage is a public engagement project based at the School of Biological, Earth and Environmental Sciences at University College Cork and is funded by Research Ireland (formerly Science Foundation Ireland).

We offer free fossil workshops which are directly linked to a variety of STEM subjects such as science and mathematics and link to important topics on the STEM curriculum such as climate change, biodiversity, animal behaviour and evolution. The workshops are suitable for primary classes from fourth class through to sixth class.

Our workshop series includes two workshops – 1) Irish Fossils 2) Mass Extinctions. Each workshop is approximately two hours in duration and includes lots of interactive activities alongside PowerPoint presentations. All materials are supplied by the facilitators, who comprise working scientists from University College Cork. Students are divided into small working groups for each activity, to facilitate maximum hands-on engagement with the materials.

This guide contains a detailed plan for each activity, including curriculum outcomes, learning intentions, skills development and a list of materials used by the students.

Other resources

Ireland's Fossil Heritage website - <https://www.ucc.ie/en/fossil-heritage/>

The website has a page dedicated to Irish fossils, including videos, pictures and information. The site also has an interactive map to show you where you can find fossils in Ireland; most fossil sites are located along the coast and in urban centres. There is a page on careers in palaeontology, including interviews with palaeontologists, and we have developed a video game called "Irish Fossil Hunt", which can also be played through our website.

Contact

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Irish Fossils Workshop – Activity 1 Fossilisation

Description

This activity introduces the students to what fossils are and how they form. Each group is given a set of six laminated cards with graphics representing each stage of fossilisation. The group is asked to arrange the cards in chronological order, from the first stage of fossilisation to the last.

Curriculum Learning Outcomes

3rd and 4th class

Science

Living things: Plant and animal life

- Develop an increasing awareness of plants and animals from wider environments
- Sort and group living things into sets according to observable features
- Become aware of some of the basic life processes

Environmental awareness: Science and the environment

- Identify the interrelationship of the living and non-living elements of local and other environments

5th and 6th class

Science

Living things: Plant and animal life

- Recognise the great diversity of plants and animals in different regions and environments
- Become familiar with the characteristics of some major groups of living things
- Become aware of some of the basic life processes

Skills Development

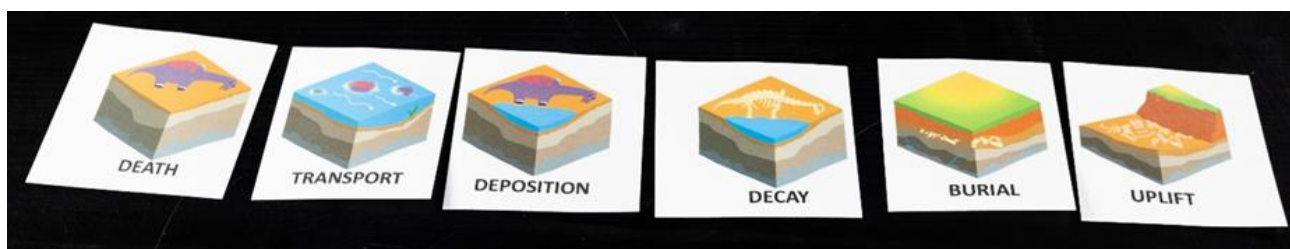
- Working scientifically
 - Questioning
 - Observing
 - Analysing
 - Sorting and classifying

Learning Intentions

- Understand that fossils are the remains of prehistoric animals and plants
- Learn to identify fossils
- Learn that fossils can be found in Ireland
- Learn that fossils can tell us about how life evolved over time

Materials

- Laminated cards with images representing each stage of fossilisation; Death, Transport, Deposition, Decay, Burial, Uplift



Irish Fossils Workshop – Activity 2 Geological Time

Description

This activity introduces the students to how old fossils are. Each group will be given a long piece of string, some pegs, laminated cards with pictures of historical events and the date when they occurred. They must arrange the events along their timeline using a scale of 1 cm = 100 years.

Curriculum Learning Outcomes

3rd and 4th class

Mathematics

Length

- Estimate, compare, measure and record lengths of a wide variety of objects, using appropriate metric units, and selecting suitable instruments of measurement

Time

- Consolidate and develop a sense of time passing

History

Early people and ancient societies

- Egyptians, Romans, Celts

5th and 6th class

Mathematics

Length

- Select and use appropriate instruments of measurement
- Rename measures of length

History

Early people and ancient societies

- Egyptians, Romans, Celts

Skills Development

- Applying knowledge
- Problem-solving
- Communicating and expressing
- Time and chronology
- Working scientifically
 - Estimating and measuring
 - Recording and communicating

Learning Intentions

- Learn how old fossils are
- Understand the concept of geological time – become familiar with scales of millions of years

Materials

- Laminated cards with well-known historical people/events: Normans, Romans, Egyptians, Oldest settlement in Ireland, Last Ice Age, First humans in Ireland
- String
- Pegs
- Measuring tape
- Geological Time Recording Template (in worksheets folder)



Irish Fossils Workshop – Activity 3 Irish Fossil ID

Description

In this activity students will learn about some common Irish fossils and how to identify them in cross-section. Each group will be given a set of images of fossils and a corresponding set of schematic cross-sections of each fossil. Each group will be asked to match each cross section with the picture of the corresponding fossil.

Curriculum Learning Outcomes

3rd and 4th class

Science

Living things: Plant and animal life

- Develop an increasing awareness of plants and animals from wider environments
- Sort and group living things into sets according to observable features
- Become aware of some of the basic life processes

Mathematics

Shape and Space: 2-D and 3-D shapes

- Use 2-D shapes and properties to solve problems
- Explore and describe the relationship of 3-D shapes with constituent 2-D shapes
- Solve and complete practical tasks and problems involving 2-D and 3-D shapes

Shape and Space: Symmetry

- Identify line symmetry in the environment
- Use understanding of line symmetry to complete missing half of a shape, picture or pattern.

Curriculum Learning Outcomes

5th and 6th class

Science

Living things: Plant and animal life

- Recognise that there is a great diversity of plants and animals in different regions and environments
- Group and compare living things into sets according to their similarities and differences
- Become familiar with the characteristics of some major groups of living things
- Become aware of some of the basic life processes
- Observe and explore some ways in which plant and animal behaviour is influenced by, or adapted to, environmental conditions

Mathematics

Shape and Space: 2-D and 3-D shapes

- Use 2-D shapes and properties to solve problems
- Identify and examine 3-D shapes and explore relationships, including tetrahedron (faces, edges and vertices)

Learning Intentions

- Understand that fossils are the remains of prehistoric animals and plants
- Be able to identify fossils
- Be aware that fossils can be found in Ireland
- Understand that there are clues left in the rock that can tell us about how these animals died

Skills Development

- Working scientifically
 - Questioning
 - Observing
 - Analysing
 - Sorting and classifying
 - Recording and communicating

Irish Fossils Workshop – Activity 3 Irish Fossil ID

Materials

- Laminated images of six common Irish fossils: Brachiopod, Solitary coral, Colonial coral, Conispiral gastropod, Planispiral gastropod, Trilobite
- Schematic cross sections of these fossils
- Plastic 3D prints of these fossils (1 set)



Irish Fossils Workshop – Activity 4 Being a Palaeontologist

Description

In this activity students will learn how to investigate rocks and fossils to understand about ancient environments and how to use clues in the rocks to learn how fossil animals lived and died. Each group will receive five photos of rocks and a description of how they formed. They must read the descriptions of these rocks and decide which one is most likely to contain fossils. They will then examine a sample of limestone containing real fossils and investigate how the crinoids died.

Curriculum Learning Outcomes

3rd and 4th class

Science

Environmental awareness: Science and the environment

- Identify the interrelationship of the living and non-living elements of local and other environments

Geography

Natural environments: Rocks and soils

- Compare and contrast materials, focusing on certain criteria
- Begin to explore the influence of soils and rocks on animal and plant life

5th and 6th class

Science

Environmental awareness: Science and the environment

- Identify the interrelationship of the living and non-living elements of local and other environments

Geography

Natural environments: Rocks and soil

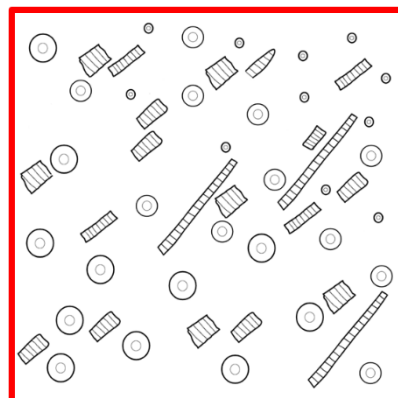
- Learn about the characteristics of some common rock types and where they may be found in Ireland and in other parts of the world

Learning Intentions

- Understand that rocks and fossils can tell us about ancient environments
- Understand that there are clues left in the rock that can tell us about how these animals died

Skills Development

- Working scientifically
 - Questioning
 - Observing
 - Investigating and experimenting
 - Analysing
 - Sorting and classifying
 - Recording and communicating



Mass Extinctions Workshop – Activity 1 Geological Logging

Description

In this activity students will learn how rocks record changes in the environment over long periods of time and how environmental change affects biodiversity over millions of years. Each group is given five boxes, each of which contains real fossils. They must record the total number of fossils and the number of fossil species present for each box (time period) and interpret the data.

Curriculum Learning Outcomes

3rd and 4th class

Science

Environmental awareness: Science and the environment

- Identify the interrelationship of the living and non-living elements of local and other environments

Mathematics

- Data: Representing and interpreting data
- Collect, organise and represent data using bar charts
- Use data sets to solve and complete practical tasks and problems

Geography

Natural environments: Rocks and soils

- Compare and contrast materials, focusing on certain criteria
- Begin to explore the influence of soils and rocks on animal and plant life

Curriculum Learning Outcomes

5th and 6th class

Science

Environmental awareness: Science and the environment

- Identify the interrelationship of the living and non-living elements of local and other environments

Mathematics

Data: Representing and interpreting data

- Collect, organise and represent data using bar charts

Geography

Natural environments: Rocks and soil

- Learn about the characteristics of some common rock types and where they may be found in Ireland and in other parts of the world

Learning Intentions

- Understand that rocks and fossils can tell us about ancient environments
- Be aware that fossils can tell us about how environments change over time
- Understand that as the environment changes so does biodiversity

Skills Development

- Working scientifically
 - Questioning
 - Observing
 - Investigating and experimenting
 - Estimating and measuring
- Analysing
 - Sorting and classifying
- Recording and communicating

Mass Extinctions Workshop – Activity 1 Geological Logging

Materials

- 5 x small boxes (per group), each containing several fossils and labelled with the age in millions of years (Ma); 300 Ma, 290 Ma, 280 Ma, 270 Ma, 260 Ma. **NOTE:** the box labelled 280 Ma should be empty.
- Laminated sheets with pictures of rocks and their age; 300 Ma - sandstone, 290 Ma - sandstone, 280 Ma - volcanic ash, 270 Ma - mudstone, 260 Ma - sandstone.
- Fossil key to identify fossils in boxes
- Geological Log (in worksheets folder) - one per group



