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
- Become aware of some of the basic life processes

Materials: Properties and characteristics of materials

- Identify and investigate some common materials
- Describe and compare materials, noting the differences in colour, shape and texture
- Investigate the characteristics of different materials when wet and dry
- Examine the changes that take place in materials when physical forces are applied

Environmental awareness: Science and the environment

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

Mathematics

Shape and Space: 2-D shapes

- Use 2-D shapes and properties to solve problems

Shape and space: 3-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

Measures: Length

- Measure and record lengths using appropriate metric units

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

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
- 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
- Identify the interrelationships and interdependence between plants and animals in local and other habitats plants and animals depend on, and compete

Materials: Properties and characteristics of materials

- Recognise that some materials decay naturally while others survive a long time in the environment
- Investigate how a wide range of materials may be changed by mixing
- Examine the changes that take place in materials when physical forces are applied
- Understanding how the rocks tell us about the natural environment

Environmental awareness: Science and the environment

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

Mathematics

Shape and Space: 2-D shapes

- Use 2-D shapes and properties to solve problems

Shape and space: 3-D shapes

- Solve and complete practical tasks and problems involving 2-D and 3-D shapes

Measures: Length

- Estimate and measure length using appropriate metric units

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:

- The students will understand that fossils are the remains of prehistoric animals and plants
- The students will be able to identify fossils
- The students will be aware that fossils can be found in Ireland

- The students will understand that there are clues left in the rock that can tell us about how these animals died
- The students will understand that there are clues left in the rock that can tell us about where these animals lived
- The students will understand that rocks can tell us about ancient environments
- The students will be aware that fossils can tell us about how life evolved over time

Skills development:

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

Assessment:

- Assessment of initial knowledge base will occur before the lesson via a questionnaire given to students by their teacher; the questionnaire will be developed by the UCC team and provided to the teacher.
- Learning of lesson content will be assessed via a Likert survey at the end of the lesson.

Evaluation of lesson

After the end of the lesson the facilitator will distribute a Likert survey to each student.

Primer

Resources:

- Laminated cards with animations of each stage of fossilisation
    - Death
    - Transport
    - Deposition
    - Burial
    - Uplift
- Laminated cards with well-known historical people/events
    - Queen Elizabeth 1600 AD
    - Normans 1100 AD
    - Vikings 800 AD
    - St Patrick 500 AD
    - Romans 27 BC
    - Egyptians 3100 BC
    - First humans in Ireland 33000 years ago
- String

- Pegs
- Measuring tape

Description of Activity:

Introduction

- This lesson will introduce the students to what fossils are, how they form, how old they are and where you can find them. The facilitator will emphasise that lots of different types of fossils can be found in Ireland.

Progression of lesson

Activity 1) Fossilisation processes

- Students will be sorted into groups of 4 or 5. Each group will be given a set of animated cards with one stage of fossilisation on each card. They group will be asked to arrange the cards in chronological order, from the first stage of fossilisation to the last.

Activity 2) Geological Timescale

- Each group will be given a long piece of string, some pegs and laminated cards with pictures of historical people and the dates they were alive.
- Each group will be asked to create a timeline by arranging the cards along the string in chronological order using a scale of 1 cm = 100 years.

Conclusion of lesson:
Facilitators will circulate a Likert survey to assess students understanding of the learning outcomes for this lesson.

Lesson 4: Fossils in Motion

Resources:

- Small boxes of sand
- Small boxes of gravel
- Small boxes of mud
- Tub for water
- Plastic syringes
- Spoon
- 3D prints of T-Rex foot
- A0 scaled print outs of Valentia Trackway
- Roll out of Valentia Island Trackway
- Laminated sheets of various fossil traces and their matching animal
- Poster paper
- Markers
- Measuring tape

Description Activity:

Introduction

- This lesson will explore trace fossils, the footprints, tracks and burrows of fossil animals. The lesson will explore how these can tell us how ancient animals lived and interacted with their environment. The facilitator will describe how the movement of animals on or in soil and mud can be recorded in rocks. They will emphasise how rare and special it is to find trace fossils, leading into how we need very specific mixtures of sand, mud, and water to preserve the traces. The facilitator will talk about some of the remarkable trace fossils found in Ireland, with reference to the Valentia Tetrapod trackway.

Progression of Lesson

Activity 1) Sand vs mud:

- Students will be sorted into groups of 4 or 5. Each group will be given a box of sand, a box of gravel and a box of mud.
- Each group will be given 3D prints of fossil "feet". The facilitator will encourage the students to investigate whether the mud or the sand or gravel best preserves the traces of the fossil. Each student will get a chance to try and push the 3D fossils into the sand and mud and see if the impression is visible in the sediment.
- The groups will then be asked to add a small amount of water (approx. 25 ml) and see what difference this makes to the impression.
- 5th and 6th class students can add water incrementally and record the ratio of water to sediment needed to preserve their traces. They can then report their findings to the larger group to compare results.

Activity 2) Identify the mystery animal:

- The facilitator will present images of modern animals and their traces/footprints using PowerPoint software. The facilitator will show a range of easy to identify traces so the students can easily match them to a modern animal.
- The facilitator will then present some more unusual traces that are made as a result of various animals' behaviours. The facilitator will introduce the concept of how traces can tell us about how ancient animals they lived in their environment.
- Each group will then be given a range of laminated sheets with pictures of fossil animals and tasked with matching the animal to the trace. The facilitator will encourage the students to discuss where the animal might have lived and how it was behaving when the imprint was made. At the conclusion of this task one child from each group will bring their animal up to the front of the class to identify the maker of the trace.

Activity 3) Valentia Trackway:

- The facilitator will circulate scaled printouts of the Valentia Tetrapod Trackway and task the students with working out what type of animal made the trackway.

Activity 4) Walk like a dinosaur:

- The facilitator will ask the class what other things we can learn about an animal from its footprints. A PowerPoint presentation will show more footprints and ask if we can tell how big they were or how fast they were.

- The facilitator will create a paper walkway at the top of the classroom, students will be asked to walk along this walkway one by one. The facilitator will measure each students stride will another student will measure the leg of each students leg.
- The results will be fed into a formula by the facilitator. The facilitator will report the dinosaur that each groups stride matches with. A discussion on speed will follow, including the exploration of the role of speed for animals, prey vs predator relationships and environmental adaptation.

Conclusion of lesson:

Facilitators will circulate a Likert survey to assess students understanding of the learning outcomes for this lesson.