Minibeast topic – How can it meet E's and O's?

One of our favourite activities to do outdoors with nursery- and primary-aged children is a minibeast hunt. It's great fun, and children can be very engaged with it. But how can it be used to teach the curriculum?

As part of the school of Biological Sciences, we usually come at activities from a Science and Environment angle (covering topics from the Sciences and Social Studies areas of the CfE), and that is what we will expand on here. However, our activities can cover multiple curricular areas, with areas of Literacy, Numeracy and Health and Wellbeing often being covered.

Observation

One of the keys skills for scientists is the skill of observation. Being able to observe the world around you, use your senses to experience it, and record what you observe are key skills for all types of scientists, but also important skills for lots of other professions including art. During a minibeast hunt children can use their senses to explore their environment to find living things. They might spot something moving, might hear the leaves rustling as creatures move underneath them, they might smell flowers that are attracting pollinators, they can feel a fly landing on their skin. (We wouldn't recommend they taste anything in the gardens, but in a safe environment in the classroom they may want to taste lettuce like a snail or caterpillar might eat, and compare it to sugar water to represent nectar that a pollinator will drink).

Curiosity

Curiosity is another skill that is essential for scientists. Constantly wanting to ask "why?", "what?" and "how?" shows a desire to understand the world around us. Minibeasts are all around us, and yet their microhabitats can seem like whole new alien worlds. Giving children the chance to examine these habitats closely gives them an opportunity for lots of new questions. Why does a particular minibeast live where it does? What does it eat? How does it move? Why doesn't it get eaten? This can develop analytical and connective thinking.

Taxonomy

Studying minibeasts can be used as a method of introducing taxonomy (the grouping of living things based on shared characteristics). How detailed and accurate the groupings are can be varied depending on the age and enthusiasm of the children you are woking with. With young children begin by looking at the differences between living and non living things, and by sorting things into any sort of groups. Groups don't need to be taxonomically "real", but could just be based on colour or whether things can fly. As children get older, cover differences between animals, plants and fungi. Animals can be further split into vertebrates (like us) and invertebrates (where the minibeasts come in!). This can be taken further with older classes by looking at groups such as insects and molluscs, or beetles compared to butterflies.

Biodiversity and Adaptations

There is a huge variety of living things on our planet. Even with the microhabitats within a school playground there can be an enormous number of different species living right beneath our feet. Living things all look different and behave differently from each other. Every living things has evolved different adaptations to help them survive in their habitat, and this contributes to the variety of body shapes and life strategies we can see all around us. By looking at minibeasts, we can see a great number of adaptations. These can be both behavioural and physical. Snails, slugs and other soft minibeasts might only come out at night or when it is raining, so that they don't get too hot and

dry out. Bees and butterflies only come out when it is warm so they have enough energy to fly and their delicate wings don't get damaged. Snails have a hard shell to protect them from predators, while some caterpillars rely on camouflage. Many minibeasts eat plants and have mouth parts that help them to chew leaves or suck nectar or sap. Other minibeasts are predators and have sharp jaws, and fast manoeuvrable bodies to help them catch their prey. Spiders spin silk to catch flies. Children can closely observe minibeasts and start to think about which parts of their bodu or behaviour helps them to live the way they do.

Food chains and webs

Again, minibeasts are great for allowing us to see biology in action in our own setting. When thinking of food chains there is a tendency to think of large mammals as the predators, but it is possible to make quite a complicated food web just with minibeasts. Some invertebrates are herbivores, others are carnivores that actively hunt their prey. Others again are involved in the decomposition of waste material to return nutrients to the soil ready for the plants to use. All minibeasts, whether herbivore, omnivore or carnivore can be prey to larger vertebrate animals, which continues the food chain up to higher levels.

Children can use the correct terminology for studying food chains.

- Producer: plants convert energy from the sun
- Consumers: primary, secondary, tertiary etc
    - Herbivore: eats plants
    - Carnivore: eats other animals
    - Detritivore: eats dead plants and animals
    - Omnivore: eats plants and animals
- Predator: kills and eats other animals
- Prey: an animal that is killed and eaten by other animals

Life Cycles

As invertebrates, many minibeasts have life cycles different from our own, often going through metamorphosis, and having multiple different stages. Many children are familiar with the idea of a caterpillar transforming into a butterfly, but this can also be expanded on by looking at other insects such as ladybirds and other beetles, bees or flies. These can then be compared with the life cycles of snails or earthworms.

Invertebrates can also be mentioned in the important role they, particularly insects, play in pollination of flowering plants, and how this allows plants to complete their life cycle.

Specific curriculum links.

Early years curriculum links:

Skills:

- Demonstrates natural curiosity and shows development of basic skills of analysis in simple and familiar contexts, for example, through asking questions, experimenting and making predictions.

- Demonstrates awareness of the importance of respecting living things and the environment

Experiences and Outcomes with benchmarks:

SCN 0-01a - I have observed living things in the environment over time and am becoming aware of how they depend on each other. SCN 0-01a

- Explores and sorts objects as living, non-living or once living.
- Describes characteristics of livings things and how they depend on each other, for example, animals which depend on plants for food

SCN 0-12a I can identify my senses and use them to explore the world around me. SCN 0-12a

- Identifies specific parts of the body related to each of the senses.
- Uses their senses to describe the world around them, giving examples of things they see, hear, smell, taste and feel.

First level curriculum links:

Skills:

- Collaborates to undertake investigations.
- Observes and collects information and makes measurements using appropriate equipment and units.
- Demonstrates awareness of their own impact on the world.

Experiences and Outcomes with benchmarks:

I can distinguish between living and non living things. I can sort living things into groups and explain my decisions. SCN 1-01a

- Explains the difference between living and non-living things, taking into consideration movement, reproduction, sensitivity, growth, excretion and feeding.
- Creates criteria for sorting living things and justifies decisions.
- Sorts living things into plant, animal and other groups using a variety of features

I can explore examples of food chains and show an appreciation of how animals and plants depend on each other for food. SCN 1-02a

- Demonstrates awareness of how energy from the sun can be taken in by plants to provide the major source of food for all living things.
- Interprets and constructs a simple food chain, using vocabulary such as ‘producer’, ‘consumer’, ‘predator’ and ‘prey’.

SOC 1-13b By exploring a natural environment different from my own, I can discover how the physical features influence the variety of living things.

- Contributes to a discussion giving reasoned opinions on how the weather affects life.
- Draws two conclusions about how living things adapt to the climate in any chosen area.

Second level curriculum links:

Skills:

- Formulates questions and predictions (hypotheses), with assistance, based on observations and information.

- Makes observations and collects information and measurements using appropriate devices and units.
- Selects appropriate methods to record data/information.
- Identifies and discusses additional knowledge and understanding gained.
- Uses appropriate scientific vocabulary and acknowledges sources, with assistance.

Experiences and Outcomes with benchmarks:

I can identify and classify examples of living things, past and present, to help me appreciate their diversity. I can relate physical and behavioural characteristics to their survival or extinction. SCN 2-01a

- Classifies living things into plants (flowering and non-flowering), animals (vertebrates and invertebrates) and other groups through knowledge of their characteristics.
- Begins to construct and use simple branched keys which can be used to identify particular plants or animals.
- Identifies characteristics of living things and their environment which have contributed to the survival or extinction of a species.
- Describes how some plants and animals have adapted to their environment, for example, for drought or by using flight.

I can use my knowledge of the interactions and energy flow between plants and animals in ecosystems, food chains and webs. I have contributed to the design or conservation of a wildlife area. SCN 2-02a

- Describes how energy flows between plants and animals in more complex food chains and webs and ecosystems, using vocabulary such as ‘producers’, ‘consumers’ and ‘herbivore’.

By investigating the lifecycles of plants and animals, I can recognise the different stages of their development. SCN 2-14a

- Plants
    - Describes how pollination occurs when the male cell (pollen) lands on the stigma.
- Animals
    - Identifies and compares the two distinct groups of animals – vertebrates and invertebrates.
    - Compares the lifecycles of some invertebrates, for example, ladybird and spider.