ACET Junior Academies'

Scheme of Work for Science

Big Idea – Our World

Year 2 – Living things and habitats

About this unit:

PoS - Living things and habitats

This unit will get students thinking about the world around them, and what it contains. This is where we really begin to differentiate between what is living and not, and the needs of living things. We will look at the features of living things – and also at things that are dead, and those that have never been living. Continuing our scientific theme from Y1, we will focus on key terms, and the properties or features of these things. We want the students to learn *how* scientists know facts, not just what scientists know. We want them to be able to work these things out for themselves.

We will look at habitats and microhabitats, and begin to be aware that living things do not live in isolation, but that they depend on each other, and on interactions with the environment and things which are not living. The students will have an opportunity to apply what they know to some unfamiliar habitats and living things – which will reinforce the need to be thinking of properties and features.

The class year book will be very important this year, as the students closely observe some habitats and the changes that happen during the year.

Students in KS1 should be taught that living things 'need air'. Fish have special features to get what they need from air underwater – you can discuss that it is oxygen that they need, but there are many misconceptions that build from this, as students don't understand what oxygen, gas, air or particles are. They are entirely abstract concepts. It's much better at this stage that they understand that 'air' is something that all living things need.

Unit structure

This unit is structured around seven science enquiries:

1. Is it alive?
2. Are plants alive? And what is dead?
3. What is my habitat?
4. What do I need?
5. Who eats who?
6. Can you link habitats and food chains together?
7. Are things the same in other habitats?

Links to previous and future National Curriculum units

EY – Children should comment and question about the place they live and the natural world

- Y2 – health & hygiene
- Y3 – plants
- Y4 – classification
- Y5 – lifecycles
- Y6 - classification

<table>
<tr><th colspan="4">Enquiry 1: Is it alive?</th></tr>
<tr><th>Links to previous learning</th><th>Scientific skills</th><th>Assessment criteria</th><th>Curricular links</th></tr>
<tr><td rowspan="3">Y1 – the importance of using key terms to identify properties of materials and features when identifying animals</td><td>EA – Identifying, grouping, classifying

Asks questions
Observing and measuring</td><td rowspan="3">Can your children:
- Identify whether something is alive or not
- Describe the features of living things
GD – explain how they know a plant is alive</td><td rowspan="3">Horizontal:

Vertical:
Y4 – classification
Y6 - classification</td></tr>
<tr><td>Key concepts:</td></tr>
<tr><td>Some things are living, and some are not.
Living things all have the same features, which make them alive.
Some things, like robots, have similar features to living things – but they don't have them all.</td></tr>
<tr><th colspan="2">Key terms</th><th colspan="2">Common misconceptions</th></tr>
<tr><td colspan="2">Living, air, food, water, move, grow, repair, babies, offspring, sense, waste</td><td colspan="2">Living things need/use air. Plants don't 'breathe', they 'use air' (it just goes in through holes in the leaves). Respiration is a specific scientific concept taught at KS3 – it does not mean breathing – don't use 'MRS GREN' or 'MRS NERG' as it refers to this concept.
Greater Depth students can discuss the need for oxygen from air – but in general, the fact that living things need air is what should be taught.
Oxygen does not 'turn to' carbon dioxide.</td></tr>
<tr><th colspan="2">Suggested activities</th><th>Resources</th><th>Useful links</th></tr>
<tr><td colspan="2">Developing words and use of words.

Compare a doll and a person. What makes them different?

As a class, decide how you know whether something is living or non-living. You could look at stories where toys 'come alive', or where there are robots. Use this for a discussion about whether they are actually alive or not.
Develop the words you will use to decide whether something is alive or not. Refer back to 'materials' from year 1 – words are important in helping us decide the properties of something. Match the words to the doll and the human.

Beware – misconceptions. DON'T USE MRS GREN/MRS NERG.

Uses air, food & water, it can move, it can grow (adults don't grow bigger', but they have grown during their lifetime. Also, growth means repair – like</td><td>A realistic doll

Pictures of a busy playground that contains people, animals, plants, and other objects.</td><td>Beware of clips/songs etc that can introduce misconceptions – if they refer to cells, breathing, respiration, then they are likely to introduce misconceptions and are not appropriate. Ensure that any resources and clips that you use refer to living things in the terms given on the left.</td></tr>
</table>

***growing new skin when you have had a cut*), it makes babies/reproduces, it can sense, it produces waste.** Give the students a picture of a busy park, or a zoo, with plants, people, animals. Decide whether things are alive or not. Students could put stickers saying 'alive' or 'not alive' on things, or they could put descriptive words on things, or circle/colour code things according to whether they are alive or not. *GD – consider plants, do they fulfil the criteria of 'living things'? Plants 'produce waste' by dropping off parts that they no longer need – leaves, petals etc. They 'sense' the sun, and can turn towards it.*		

Enquiry 2: Are plants alive? And what is dead?

Links to previous learning	Scientific skills	Assessment criteria	Curricular links
Y1 – the importance of using key terms to identify properties of materials and features when identifying animals	EA – Observation over time Asks questions **Observing** and measuring **Key concepts:** All living things die at some point. 'Dead' means it was alive and now it isn't. Some things have never been alive.	**Can your children:** - Differentiate between things that are dead, and that have never been alive - Describe the features of living things	**Horizontal:** **Vertical:** Y4 – classification Y6 - classification

Key terms	Common misconceptions
Living, dead, never alive, air, food, water, move, grow, repair, babies, offspring, sense, waste	*Misconception – plants do **NOT** get food from the soil. They **make** food in their leaves, using the sun. The soil gives them some extra nutrients – like us eating some veg/taking vitamin tablets.* *They don't 'breathe' in & out – but they do need air.*

Suggested activities	Resources	Useful links
Look at some plants in pots – watch timelapse videos of plants growing/turning to face the sun. Are plants doing all the things above? Go outside (or look out of the window or look at pictures) – how many living and non-living things can you spot? Most of the living things you see outside will be plants. Collect some sticks and leaves, and cut grass. Are these things alive? Compare a vase of cut flowers with a pot plant. They should develop a sense that some non-living things were alive once, others have never been alive. 'Dead' – means they used to be living, but have stopped doing the things that made them alive. Classify things into 3 groups – living, dead, never been alive. Use the words that you developed during lesson 1 – write the words on cards. Have word cards and picture cards available to the students. They have 3 hula hoops/areas to put things in. Challenge – can you think up more words that you can use to describe the things in the hoops? Class discussion – do the words apply to ALL things that are living/dead/never been alive?	Vase of cut flowers Pot plant Go outside to collect a range of non-living objects Cards for writing the words you use to describe things that are living, dead and never been alive 3 hula hoops, or clear areas	https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-what-do-plants-need-to-survive/zkw2gwx

This is a relatively abstract topic, and can be difficult for students to grasp – we say that plants need air, but we can't actually see/prove/demonstrate this. It is important that they question whether something is alive or not, and think along the lines of needing air, needing water, growing, making babies. It can be very difficult to decide one way or another, and it's not important for the students to be able to be sure at this point – as long as they are noticing the key points. As long as they are discussing the topic, and are questioning whether something is alive or not along the right path, the 'work' could be based on literacy/handwriting/spelling rather than on 'teaching' students whether something is alive or not.		

<table>
<tr><th colspan="4">Enquiry 3: What is my habitat?</th></tr>
<tr><th>Links to previous learning</th><th>Scientific skills</th><th>Assessment criteria</th><th>Curricular links</th></tr>
<tr><td rowspan="3">Y1 – Identifying animals
Y1 - plants</td><td>EA – Observation over time (abstract – taking observations for future comparison)

Asking questions
Making predictions
Setting up tests</td><td rowspan="3">Can your children:
- Tell you what they found and where
- Describe the habitat of a living thing of their choosing</td><td rowspan="3">Horizontal:
Maths - measuring

Vertical:
Y4 – Classification
Y6 - Classification</td></tr>
<tr><td>Key concepts:</td></tr>
<tr><td>Living things like to live in particular areas.
When we look in different areas we find different things living there.</td></tr>
<tr><th colspan="2">Key terms</th><th colspan="2">Common misconceptions</th></tr>
<tr><td colspan="2">Living, dead, never alive, light, dark, dry, damp, wet, habitat</td><td colspan="2">Students often think that all invertebrates like the same conditions – try and differentiate between different microhabitats; wet, dry, dark, light, above ground or underground.</td></tr>
<tr><th colspan="2">Suggested activities</th><th>Resources</th><th>Useful links</th></tr>
<tr><td colspan="2">Keep some records of the habitats you study for your class year book.

Teacher to decide on different areas of comparable size for students to try and find minibeasts – one area for each group.

The students should count how many of different types they find (spiders, woodlice, worms, ‘other’). They should also decide how to describe their area. Is it dry/wet/dark/light etc. Try and be as descriptive as possible – what is it ‘like’ for the creatures that live there?

Each group to present information about their habitat and what creatures they found. Is there a pattern? Do some minibeasts prefer different areas?

This is an opportunity for the class to decide how to record information for the year book so that it is comparable later in the year. They could all make tally charts, so that each area can be compared. It could be as simple as ‘things with legs/things with no legs’, or they could identify spiders, harvestmen, worms, woodlice.

Take some measurements for comparison. An adult could take these measurements – students will have a lesson later in the year when they see whether plants have grown – they will have to take the measurements then.</td><td>Go outside and observe a habitat, and a microhabitat

Invertebrate identification keys
Hand lenses</td><td></td></tr>
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<table>
<tr><th colspan="4">Enquiry 4: What do I need?</th></tr>
<tr><th>Links to previous learning</th><th>Scientific skills</th><th>Assessment criteria</th><th>Curricular links</th></tr>
<tr><td>EY – notices features of objects in their environments

Y1 – Human body and senses</td><td>EA – Problem solving

Asking questions
Making predictions
Observing
Key concepts:
Living things need a place to live.
Where you live provides you with food, a safe space, and everything else you might need.</td><td>Can your children:
- Identify that they need food and a safe place
- Identify 2 things that a given vertebrate needs from its habitat</td><td>Horizontal:
Y2 – Health & hygiene

Vertical:
Y3 – Nutrition, skeleton & muscles
Y5 – Growing uprowth
Y6 – Healthy humans</td></tr>
<tr><th colspan="2">Key terms</th><th colspan="2">Common misconceptions</th></tr>
<tr><td colspan="2">Living, dead, never alive, light, dark, dry, damp, wet, habitat, microhabitat, food, warmth, safety, shelter</td><td colspan="2">Some students find it difficult to define a habitat because they can be different sizes. A habitat can be huge if you're a tiger, or tiny if you are a woodlouse.</td></tr>
<tr><th colspan="2">Suggested activities</th><th>Resources</th><th>Useful links</th></tr>
<tr><td colspan="2">Getting what I need
What do YOU need to stay alive? Leave this open – love, cuddles, chocolate… whatever! Where do you get it from? – get them to think of their 'habitat' – their home/s, extended family – where everything they need is provided for them. Their school, the local park, Nannan's house, local shops – these could be included in their 'habitat'. Places that they occasionally travel to - for example, if they drive to their grandparents' house at weekends – are NOT included in their habitat.

If you are a worm, what do you need? Would a worm get all the things it needs if it lived in your house?

If you are a tiger, what do you need? Would a tiger get all the things it needs if it lived in your house?

What about a bird? A fish?

Students can pick any living thing, and make a study of its habitat. This could be from a book, or a real example. If choosing examples from the internet, make sure that they have enough information about the organisms and their habitat – a variety of pictures of them in their environment, where they sleep, what they eat. Don't use domesticated animals like cats & dogs, or farm animals, as their habitats are controlled by humans. Try and use</td><td>Books</td><td></td></tr>
</table>

native animals like squirrels, rabbits, foxes, badgers, moles, birds where possible. The terms 'habitat' and 'microhabitat' can be introduced – the size of a habitat depends on how far a living thing travels around. A micro-habitat is a very small area that minibeasts will stay in when they find one they like.		

<table>
<tr><th colspan="4">Enquiry 5: Who eats who?</th></tr>
<tr><th>Links to previous learning</th><th>Scientific skills</th><th>Assessment criteria</th><th>Curricular links</th></tr>
<tr><td rowspan="3">Y1 – Identifying animals – carnivores, herbivores and omnivores</td><td>EA – Identifying, grouping and classifying

Asking questions
Making predictions
Observing</td><td rowspan="3">Can your children:
- Recall that animals are carnivores, herbivores or omnivores
- Describe the meaning of a simple food chain</td><td rowspan="3">Horizontal:
Art – Making and displaying food chains
Y2 – Health & hygiene

Vertical:
Y3 – Nutrition, skeleton and muscles
Y4 – Classification
Y6 - Classification</td></tr>
<tr><td>Key concepts:</td></tr>
<tr><td>Animals have to eat food to stay alive.
You can put animals in a chain to show which animal eats which.
Every food chain starts with a plant.</td></tr>
<tr><th colspan="2">Key terms</th><th colspan="2">Common misconceptions</th></tr>
<tr><td colspan="2">Carnivore, herbivore, omnivore, eat, food, chain,</td><td colspan="2">Beware possible complexity with worms/woodlice etc as they eat things that have already died – a food chain should show which animals predate on/’catch’ living things to eat. Animals which eat dead things fit into food chains differently – the decomposers can be shown alongside the food chain. The students do NOT need to know this at this point. Just steer them away from organisms which eat dead material (use it to reinforce what is living and dead from the beginning of the unit), and say that they fit into food chains differently. Also, keep away from food chains that include humans, as we are omnivores, don’t hunt our food – and it just gets complicated!</td></tr>
<tr><th colspan="2">Suggested activities</th><th>Resources</th><th>Useful links</th></tr>
<tr><td colspan="2">Food chains – try and relate this to examples that students are familiar with, rather than just showing food chains of caterpillars/birds/eagles. It’s much more effective if the students are aware of the plants and animals they’re considering.

Passing it on - Peter Rabbit
What is Peter Rabbit’s habitat? What is real and what is not? Suggested list below – they can add to it.
Real – lives in a burrow, eats radishes, lettuces, grass; Owls and foxes try to eat him.
Not real – wearing clothes, sleeping in beds, walking upright and talking.

Look at a picture/series of pictures that show the ‘real’ things above. How do they depend on each other? What eats what?

Try and find as many other books/examples of one thing eating another.</td><td>Peter Rabbit – books, pictures, clips – to show what Peter Rabbit eats, and the animals which want to eat Peter Rabbit</td><td></td></tr>
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Greater depth students could consider how food chains can be different lengths. Radish -> rabbit -> owl is only three living things, but you could have radish -> caterpillar -> blue tit -> owl. Once they have considered this, they can look into how many of each thing the animals would need to eat. How many radish would a rabbit eat, compared to a caterpillar? Art link – make some food chains showing what eats what – hanging from coat hangers etc.		

<table>
<tr><th colspan="4">Enquiry 6: Can you link habitats and food chains together?</th></tr>
<tr><th>Links to previous learning</th><th>Scientific skills</th><th>Assessment criteria</th><th>Curricular links</th></tr>
<tr><td rowspan="3">EY – notices features of objects in their environment
Y1 - Identifying animals</td><td>EA – Problem solving

Asking questions
Interpreting and communicating data</td><td rowspan="3">Can your children:
- Name a number of key features of their living things' habitat
- Identify a food chain</td><td rowspan="3">Horizontal:
Art
D&T
Geography

Vertical:
Y4 Classification
Y6 Classification</td></tr>
<tr><td>Key concepts:</td></tr>
<tr><td>Habitats and food chains are linked together.
A living thing eats food from its habitat, and may get eaten by something that comes in to its habitat.</td></tr>
<tr><th colspan="2">Key terms</th><th colspan="2">Common misconceptions</th></tr>
<tr><td colspan="2">Carnivore, herbivore, omnivore, eat, food, chain, living, dead, never alive, light, dark, dry, damp, wet, habitat, microhabitat, food, warmth, safety, shelter</td><td colspan="2">Students often don't understand that plants have habitats too – each plant has a preferred place to live, and won't survive in an unsuitable habitat. This is not always appropriate to discuss with most students in Y2, as it's too abstract. The plants can't 'move', and they don't necessarily know about seeds and plant reproduction.</td></tr>
<tr><th>Suggested activities</th><th>Resources</th><th colspan="2">Useful links</th></tr>
<tr><td>Habitat and food chain dioramas – bringing it all together

Use an open sided box to illustrate a habitat. Put in all the living and non-living things that are in that habitat. Can you label which things are living, dead, never been alive? Can you show a food chain as well?

Use the diorama to emphasise the key terms and concepts that have been taught in the unit, and get the students to add as many as possible.</td><td>Shoeboxes or similar

Paints & equipment for modelling</td><td colspan="2">https://www.firstpalette.com/craft/polar-habitat-diorama.html</td></tr>
</table>

<table>
<tr><th colspan="4">Enquiry 7: Are things the same in other habitats?</th></tr>
<tr><th>Links to previous learning</th><th>Scientific skills</th><th>Assessment criteria</th><th>Curricular links</th></tr>
<tr><td rowspan="2">EY – notices features of objects in their environment
Y1 - Identifying animals – carnivores, herbivores and omnivores</td><td>EA – Research

Asking questions
Making predictions</td><td rowspan="2">Can your children:
- State that a habitat is the area which provides food and shelter for an animal
- Suggest the habitat of an unfamiliar animal
GD – discuss why an animal might need a particular habitat</td><td rowspan="2">Horizontal:
Geography

Vertical:
Y4 – Classification
Y6 - Classification</td></tr>
<tr><td>Key concepts:
All animals need their habitats to provide food and shelter.
Most habitats provide more than that.
Different animals have different habitats that suit them.</td></tr>
<tr><th colspan="2">Key terms</th><th colspan="2">Common misconceptions</th></tr>
<tr><td colspan="2">Carnivore, herbivore, omnivore, eat, food, chain, living, dead, never alive, light, dark, dry, damp, wet, habitat, microhabitat, food, warmth, safety, shelter</td><td colspan="2"></td></tr>
<tr><th>Suggested activities</th><th>Resources</th><th colspan="2">Useful links</th></tr>
<tr><td>Unfamiliar habitats

Look at underwater habitats, Arctic habitats, forests, seashore. This could be in books, video clips, or a variety of pictures.

What do you think it's like in this habitat? Would you like to live in this habitat? What would you need to survive in this habitat? What sort of creatures do you think live here? Where do they get their food from?

Give the students a variety of pictures of animals. They could match them to the habitats, and then try and make food chains from them. Use what they learnt about the teeth and characteristics of carnivores, herbivores and omnivores to try and decide about the animals. It doesn't matter whether they are 'right' or not – but that they are asking questions, and are thinking of reasons for their decisions that are based on the things they have learnt.</td><td>Books/pictures showing a number of unfamiliar habitats, and the animals that live in them. You may need more than one picture of the same habitat.</td><td colspan="2"></td></tr>
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