ACET Junior Academies'

Scheme of Work for Science

Big Idea – Living Things

Year 2 – Life cycles

About this unit:

PoS Animals, including humans & **Plants**

There are obvious links to PSHE in this unit in terms of reproduction**.** The concept that needs to be addressed in terms of the science, is that two adults produce offspring. The focus is on the fact that those offspring grow up, and produce offspring of their own. No details are needed of reproduction – but it is likely to be something the students ask about.

Offspring is a good word to introduce to the students, as 'babies' can be misleading when discussing plants/seeds/eggs/larvae. However babies is acceptable if the students are more comfortable with it.

This unit combines concepts from two topics in the programme of study. We will begin by looking at the concept of generations, and that there are different stages of human life. We will consider what is needed in general in order to stay alive, and then look more closely at whether living things have different needs at different stages of their lives. Having introduced the concept of life stages, we will then move on to look at life cycles, and how adult living things can produce offspring, which go on to become adults themselves, and produce offspring of their own.

Students will study the needs of plants later in the year; in this unit, they will build on what they learnt about plants in Y1. They already know the basic structure of plants, and now they will look at how plants reproduce, learning the conditions needed and becoming familiar with the terms we use.

Activities to consider – growing maggots in the classroom, growing frogspawn in the classroom (or in a pond if there's one available).

Unit structure

This unit is structured around six science enquiries:

1. What is a family tree?
2. Do we all need the same things?
3. How are new animals made?
4. How are new plants made?
5. How is life like a circle?
6. Can we grow our own seeds?

Links to previous and future National Curriculum units

PSHE

Y1 – Needs of animals, structure of plants

- Y2 – Plants – what they need to survive
- Y3 – Plants
- Y5 – Life cycles
- Y6 – Healthy humans

<table>
<tr><th colspan="4">Enquiry 1: What is a family tree?</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 – have some understanding of growth and change</td><td>EA – Pattern seeking

Asking questions
Making predictions
Recording data</td><td rowspan="3">Can your children:
- Identify grandparents, parents and children from a family
- Put each generation in the correct place in a family tree
GD – discuss ‘generations’ as a concept</td><td rowspan="3">Horizontal:
Y2 - plants
Maths – scales (some students)

Vertical:
Y5 – Life cycles</td></tr>
<tr><td>Key concepts:</td></tr>
<tr><td>All families have generations – grandparents, parents, children.
We can show the generations of a family on a special chart called a family tree.</td></tr>
<tr><th colspan="2">Key terms</th><th colspan="2">Common misconceptions</th></tr>
<tr><td colspan="2">Offspring, parents, grandparents, children, older, younger, time</td><td colspan="2">Students find it hard to understand that generations don’t happen at the same time – some grandparents may be in their 40s, and others in their 60s. This is a difficult, abstract concept that doesn’t need to be addressed with students of lower ability. Maths scales and timelines may help with those trying to understand it.</td></tr>
<tr><th colspan="2">Suggested activities</th><th>Resources</th><th>Useful links</th></tr>
<tr><td colspan="2">Students can make a family tree for themselves, or for a character from a book. What is important is that they get an understanding of generations – children, parents, grandparents.

They could do this for a range of families (real or fictional), and then make a display, showing that all families have these generations. Greater depth – they don’t all happen at the same time, but the generations are there.</td><td></td><td></td></tr>
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<table>
<tr><th colspan="4">Enquiry 2: Do we all need the same things?</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 – Human body and senses
Y2 – Health and hygiene</td><td>EA – Identifying, grouping and classifying

Asking questions
Making predictions
Interpreting and communicating data</td><td rowspan="3">Can your children:
- State that people at different stages of life need different amounts of food
- Tell you what might be different between their diet and their parents or grandparents</td><td rowspan="3">Horizontal:
Y2 – Health and hygiene - diet

Vertical:
Y6 – Healthy humans</td></tr>
<tr><td>Key concepts:</td></tr>
<tr><td>People at different stages of life have different needs.
A baby needs different food to a child, who needs different food to a grownup.
GD – review the different food groups they learnt about. Link proteins to the need for growth.</td></tr>
</table>

Key terms	Common misconceptions
Babies, children, teenagers, adults, elderly, parents, grandparents, offspring, grow, repair, healthy	*Make sure that students are discussing an 'ideal' diet, rather than comparing what they and their parents actually eat, if this is unhealthy/not ideal.*

Suggested activities	Resources	Useful links
Review the work they did last term – what do we need to stay alive? To stay healthy? Babies, Y2 students, parents/teachers, grandparents. Think about what they need – what do they have in common, and what different needs might they have? *This should be an open-ended task for the students to come up with ideas for. The class/groups can come to a decision together rather than be told they're right/wrong.* Revisit previous units – all humans need air, water and food, and we have a range of other needs too. Students should come to an understanding that young children need to grow, whereas adults don't. Adults still need food to help them repair their bodies, and keep them healthy. Students often misunderstand why some people need to eat more than others. It's related to how much you're growing, how much exercise you are doing, and how big you are - bigger bodies need more food (although that doesn't apply if the body is large because of fat stores). They could make meal plans/activity timetables for people of different ages.		

<table>
<tr><th colspan="4">Enquiry 3: How are new animals made?</th></tr>
<tr><th>Links to previous learning</th><th>Scientific skills</th><th>Assessment criteria</th><th>Curricular links</th></tr>
<tr><td>Y1 – Seasons
Y1 – Identifying animals</td><td>EA – Identifying, grouping, classifying

Asking questions
Making predictions
Observing & measuring
Key concepts:
‘Growth’ does not always mean ‘getting bigger’ - many changes happen as animals grow.
Not all animals develop in the same way.</td><td>Can your children:
- Tell you that adults and offspring often have different forms
- Describe an animal which has a different form as offspring</td><td>Horizontal:

Vertical:
Y5 - Life cycles</td></tr>
<tr><th colspan="2">Key terms</th><th colspan="2">Common misconceptions</th></tr>
<tr><td colspan="2">Adult, offspring, grow, change, metamorphosis,</td><td colspan="2">Students often believe that only caterpillars form pupae; in fact many insects transform themselves from larvae into a flying form.</td></tr>
<tr><th colspan="2">Suggested activities</th><th>Resources</th><th>Useful links</th></tr>
<tr><td colspan="2">PSHE guidance needed for reproduction. Students are not required to know about reproduction here – the focus is on growth from early stages to adulthood. It is relevant for them to know that most animals require two parents to produce offspring.

Matching baby animals to their adult forms – using pictures.
The students should be familiar with this – lambs, chicks, puppies, babies etc. Reinforce this, but consider other living things too.

Monkey Puzzle, The Hungry Caterpillar - get the students to consider what the baby forms look like.

Go outside – collect or photograph some animals and plants. Are they adults or babies? How can you tell? - there is no real answer to this – just get the students to consider the question, and come up with some reasons that might make sense.

Animals - What does a baby woodlouse look like? What does a baby worm look like? A baby fly? A baby spider? A baby bird? Frog? Fish?

Activity – get some maggots from a fishing shop. Allow a few of them to turn into flies – watch the pupating stage (this may take a few weeks. DON’T use very many!!) – or watch the clip – resources.</td><td></td><td>https://alltop.com/viral/watch-a-maggot-turn-into-a-fly-in-about-a-minute-video</td></tr>
</table>

Activity – grow some frogspawn in the classroom. Students could make fact sheets about different animals – are they born live, like mini adults and then grow (mammals); from an egg, and emerge like mini adults (stick insects, grasshoppers); or from an egg and then go through a transformation stage (caterpillars, maggots, frogspawn)? The different fact sheets can then be compared, and possibly grouped into different types of animals.		

<table>
<tr><th colspan="4">Enquiry 4: How are new plants made?</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">Y1 - Plants</td><td>EA – Observation over time

Asking questions
Making predictions</td><td rowspan="2">Can your children:
- Describe a seed as something that a new plant will grow from
- Tell you that a seed needs water and warmth to germinate</td><td rowspan="2">Horizontal:

Vertical:
Y5 - Life cycles</td></tr>
<tr><td>Key concepts:
New plants grow from seeds.
When a seed gets water and warmth, roots and shoots come out of it to start growing.
GD – understand that the seed has a store of food. Use the term ‘germination’</td></tr>
<tr><th colspan="2">Key terms</th><th colspan="2">Common misconceptions</th></tr>
<tr><td colspan="2">Seed, plant, adult, offspring, water, warmth, germinate, food, store</td><td colspan="2">A plant only needs light when you can see the green leaves.</td></tr>
<tr><th colspan="2">Suggested activities</th><th>Resources</th><th>Useful links</th></tr>
<tr><td colspan="2">Opportunity to gather records for the year book – look out for flowers, catkins, buds and other new growth on trees.

Germinate different seeds in the classroom – avocado seed, cress seed, dried beans (these will need soaking before they can germinate). Do this in a way that the students can see roots and shoots emerging -avocado suspended over a glass, cress seed on damp kitchen towel, bean in an empty, clear CD case.

They should understand that the seed has a store of food in it, for the plant to start growing. The food store is not unlimited – before long the plant will need to be planted in soil, and the leaves will have to start to make food.
Misconception – the plants do NOT get food from the soil, but there are nutrients there that help them stay alive – just like eating fruit and veg (vitamins and minerals) keeps us healthier.

Consider what they need to germinate. They will need water and some warmth. They don’t need light, until the leaves start to form.
Students can draw their seeds, or explain how they germinate.

Describe seeds as a ‘spaceship’. The seed has been ‘sent out’ from the parent plant, sealed up with everything it needs. When it gets water & warmth, the root & shoot will burst out, using up the food store in the seed until it has grown leaves and can start feeding itself.</td><td>Go outside and collect information for the year book

Germinate seeds in the classroom
- Avocado suspended over water
- Cress on damp kitchen towel
- Bean in a CD case

The bean seeds will be useful for Enquiry 6.</td><td>https://steemit.com/steemiteducation/@sweetpea/science-experiment-sprout-beans-in-a-cd-case-observe-the-germination-process - beans in a CD case

https://www.youtube.com/watch?v=jt2_5UdcLBg – avocado from seed (with no toothpicks!)</td></tr>
</table>

<table>
<tr><td colspan="4">Enquiry 5: How is a life like a circle?</td></tr>
<tr><td>Links to previous learning</td><td>Scientific skills</td><td>Assessment criteria</td><td>Curricular links</td></tr>
<tr><td rowspan="3">Y1 – Seasons</td><td>EA – Problem solving

Asking questions
Making predictions
Interpreting and communicating data</td><td rowspan="3">Can your children:
- Describe what is happening when they are shown a life cycle</td><td rowspan="3">Horizontal:
Maths - shapes

Vertical:
Y5 - Life cycles</td></tr>
<tr><td>Key concepts:</td></tr>
<tr><td>A life cycle shows that adults can produce offspring, which grow into adults and can do the same again.</td></tr>
<tr><td colspan="2">Key terms</td><td colspan="2">Common misconceptions</td></tr>
<tr><td colspan="2">Life cycle, adult, offspring, circle, repeat</td><td colspan="2">Students are often confused when looking at a life cycle, as it appears to be events in one living thing life, but two are needed for reproduction. Choose resources carefully that it is clear to student that another adult form is needed for the reproduction stage.
Students are also often confused about where ‘death’ comes in the life cycle.</td></tr>
<tr><td>Suggested activities</td><td>Resources</td><td colspan="2">Useful links</td></tr>
<tr><td>Choose a living thing from the previous lessons, and produce a life cycle. You will probably want to prepare information from a limited number of living things, including examples of different types of animals (including invertebrates) and some plants.

This lesson can be used to reinforce any points from previous lessons. The important concept is that from the adult, you continue back to the first stage of the life cycle – because adults can produce offspring.

Consideration – for most living things, two adults are needed to produce an offspring. PSHE guidance needed here - reproduction does not need to be taught – just that adults can have offspring, which turn into adults, and the whole process starts again, thus forming a cycle. Make sure you choose resources/images that show this. See misconceptions.

Take time to discuss the fact that a life cycle does not represent a ‘whole life’ – it’s just showing where one life leads to a new one, and that cycle gets repeated over and over. Students often get very confused about where ‘death’ comes in the cycle.</td><td></td><td colspan="2">Clips of Lion King – the circle of life song.
Discuss the words of the song – why is life like a circle?</td></tr>
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<table>
<tr><th colspan="4">Enquiry 6: Can we grow our own seeds?</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">Y1 – Seasons
Y1 - Plants</td><td>EA – Observation over time

Asking questions
Making predictions
Setting up tests</td><td rowspan="2">Can your children:
- Describe how to plant seeds, and what care they will need
- Tell you that the information we need about germinating seeds is found on the packet</td><td rowspan="2">Horizontal:

Vertical:
Y5 - Life cycles</td></tr>
<tr><td>Key concepts:
When we plant seeds, we need to make sure they get water and warmth to germinate.
Different plants have different needs – we need to look at the back of a seed packet to find out how to plant them.</td></tr>
<tr><th colspan="2">Key terms</th><th colspan="2">Common misconceptions</th></tr>
<tr><td colspan="2">Plants, grow, germinate, healthy,</td><td colspan="2"></td></tr>
<tr><th colspan="2">Suggested activities</th><th>Resources</th><th>Useful links</th></tr>
<tr><td colspan="2">These will be studied in Summer 2.

These could be vegetables or flowers. Review the seeds you grew to illustrate germination (Enquiry 4), and explain that we want to germinate the seeds AND give them the best conditions to grow into adult plants. You could use the bean seeds that were germinated in enquiry 4.

Students should plan how they are going to plant them, where, and what they will do to care for them. They should track the plants' progress over coming lessons.

They can look at the back of the packets for guidance on the points above.</td><td>Bean seeds from Enquiry 4

Seeds – from a packet with information on it
Soil/potting compost
Containers</td><td></td></tr>
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