

# ACET Junior Academies'

## Scheme of Work for Science

### Big Idea – Living Things

#### Year 5 – Life cycles of plants



#### **About this unit:**

##### **PoS – Living things and their habitats**

This is a short unit to add the life cycle of plants to the work on life cycles of animals at the beginning of the year. It is an ideal opportunity to review the class year book, and to plant seeds, bulbs and take cuttings.

Students will review what they learnt about animal life cycles earlier in the year. There are opportunities in this unit to consolidate their understanding, as they compare them to the life cycles of plants. They will review what they know about plants, their structures and how they reproduce. Students often confuse pollination with seed dispersal, as the mechanism for both can be similar, and in this unit there is an opportunity to address that.

In the fourth lesson, we will look at how plants can reproduce asexually to form clones, and the students should have an opportunity to clone some plants. This will obviously lead on to a comparison of asexual reproduction with sexual reproduction, which then usually leads to lots of questions about sex and sexual reproduction. Teachers should be aware of this from a PSHE perspective.

#### **Unit structure**

This unit is structured around four science enquiries:

1. What has changed since Autumn?
2. How do plants reproduce?
3. What is the life cycle of a plant?
4. Can we clone a plant?

#### **Links to previous and future National Curriculum units**

Y2 – Life cycles

Y3 - PLants

PSHE

- Y6 – Nutrition & transport

KS3&4 - Genetics

Enquiry 1: What has changed since Autumn?			
Links to previous learning	Scientific skills	Assessment criteria	Curricular links
Y2&3 – Plants Y4 - Classification	EA – Observation over time	<b>Can your children:</b> <ul style="list-style-type: none"> <li>- Identify something they would do differently in the previous data collecting session</li> <li>- Create a table to collect data</li> </ul>	<b>Horizontal:</b>  <b>Vertical:</b> Y6 - Classification
	Asking questions Observing and measuring <b>Recording data</b> Evaluating		
	<b>Key concepts:</b> When we are reviewing data, we should always consider whether we would do anything differently if we did it again. When scientists are collecting data, they put it in tables so that they can keep it organised and make it easier to compare.		
Key terms		Common misconceptions	
Habitat, living things, change, growth, data, evaluate, measure, compare			
Suggested activities		Resources	Useful links
<p>– Go outside and document the 5 living things you chose in Autumn 1. How have they changed? Are they the changes you expected to see?</p> <p>If they have grown, can you say where? Have they grown all over, or in particular places? Have the trunks/stems of plants increased in circumference? Length? Compare all the measurements you took in Autumn 1.</p> <p>Looking back, are there any measurements you wish you'd taken then? Did you record your measurements well? Did you leave space to record more data later in the year? Can you try and make a table for the data you have collected, leaving spaces for the measurements you'll make in the summer?</p> <p><i>GD – what graphs do you think you'll be able to draw once you have all the data? Will they be line graphs or bar charts? Are there some pieces of data that are not suitable for putting in a graph? How could you display that data effectively?</i></p>		Identification sheets Hand lenses Measuring equipment	

Enquiry 2: How do plants reproduce?			
Links to previous learning	Scientific skills	Assessment criteria	Curricular links
Y2&3 – Plants Y4 - Classification	EA – Identifying, grouping & classifying	<b>Can your children:</b> <ul style="list-style-type: none"> <li>- Describe how plants can be pollinated</li> <li>- Describe how seeds can be dispersed</li> </ul> GD – explain why seeds need to be dispersed	<b>Horizontal:</b>  <b>Vertical:</b> Y6 - Classification
	<b>Asking questions</b> Making predictions		
	<b>Key concepts:</b> Plants have special features to help the pollen reach another flower so that a seed can be made. Plants have special features to disperse their seeds, so that offspring don't grow too close to the parent plant. <i>GD can compare wind pollination and seed dispersal, or discuss competition between parents and offspring.</i>		
Key terms		Common misconceptions	
Plant, flower, reproduce, pollen, insects, wind, seeds, fruit, animal, dispersal, competition		<i>Students often mix up the words 'plant' and 'flower'. Try and ensure that they are always used appropriately.</i> <i>Students also confuse pollination with seed dispersal. It's important they understand that they are two totally different processes.</i>	
Suggested activities		Resources	Useful links
<p>General structures – names and functions. Students could dissect flowers – tulip and daffodil – and compare the inner structures.</p> <p>How do plants reproduce? Illustrate how plants are pollinated by insects or the wind. This produces seeds, which are dispersed – discuss why plants need to disperse seeds.</p> <p>Make sure students are comfortable with the terminology and processes.</p> <p>Compare pictures of wind pollination and seed dispersal. Can the students tell the difference? Pollination is where pollen is being taken to another flower to <b>make</b> a seed; seed dispersal means that a seed is being taken away from the parent plant so it can grow somewhere else.</p>		Flowers for dissection Sharp scissors	<a href="file:///aa-fs1/homedir\$/inga.durkin/Downloads/Parts-of-a-Flower-Sketch-KS2.pdf">file:///aa-fs1/homedir\$/inga.durkin/Downloads/Parts-of-a-Flower-Sketch-KS2.pdf</a> Guidance for flower dissection  <a href="https://www.buzzaboutbees.net/wind-pollination.html">https://www.buzzaboutbees.net/wind-pollination.html</a> Wind and insect pollination  <a href="https://www.bbc.co.uk/bitesize/clips/znvfb9g">https://www.bbc.co.uk/bitesize/clips/znvfb9g</a> Seed dispersal

<b>Enquiry 3: What is the life cycle of a plant?</b>			
<b>Links to previous learning</b>	<b>Scientific skills</b>	<b>Assessment criteria</b>	<b>Curricular links</b>
Y2&3 – Plants Y4 - Classification	EA – Problem solving  Asking questions Making predictions <b>Interpreting and communicating data</b>	<b>Can your children:</b> <ul style="list-style-type: none"> <li>- State a similarity and a difference between the life cycle of a plant and that of an animal</li> <li>- Name the stages in the life cycle of a plant</li> </ul>	<b>Horizontal:</b>  <b>Vertical:</b> Y6 - Classification
	<b>Key concepts:</b>		
	Compare the life cycle of a plant to those of animals. Name the stages in the life cycle of a plant.		
<b>Key terms</b>		<b>Common misconceptions</b>	
Plant, germination, growth, flowering, pollination, seed dispersal, reproduction			
<b>Suggested activities</b>		<b>Resources</b>	<b>Useful links</b>
<p>Choose a plant – we're going to draw a life cycle of them. <i>Don't choose a conifer, fern or moss, as these are non-flowering plants. Students don't need to know any details of these. Remember that all other plants – including trees and grasses, are flowering plants, but that the flowers may not look like typical flowers.</i></p> <p>Go back to the work of Autumn 1 on life cycles, and how they can be illustrated, in order to do this. As with the life cycle of birds, flowering plants all have the same basic life cycle, but look quite different. Can you put flowering, pollination, seed formation, seed dispersal, germination, growth into a life cycle? What do your chosen plants look like at each stage of the cycle?</p> <p>Points to include: Germination Growth Flowering Pollination Seed dispersal</p>			<p><a href="https://www.bbc.co.uk/bitesize/clips/zgqyrdm">https://www.bbc.co.uk/bitesize/clips/zgqyrdm</a> Life cycle of a plant</p> <p><a href="https://www.bbc.co.uk/bitesize/topics/zgssgk7/articles/zyv3jty">https://www.bbc.co.uk/bitesize/topics/zgssgk7/articles/zyv3jty</a> Life cycles of plants – we will be looking at asexual reproduction next lesson</p>

Enquiry 4: Can you clone a plant?			
Links to previous learning	Scientific skills	Assessment criteria	Curricular links
Y2&3 – Plants Y4 - Classification	EA – Problem Solving	<b>Can your children:</b> - Describe what asexual reproduction is - Define a clone	<b>Horizontal:</b> PSHE  <b>Vertical:</b> Y6 - Classification
	Asking questions <b>Making predictions</b>		
	<b>Key concepts:</b> Plants can grow whole new plants from themselves, without needing another plant for pollination. A clone is a living thing produced by exactly copying one parent.		
Key terms		Common misconceptions	
Asexual, sexual, reproduction, one parent, clone, identical, offspring		Students often misunderstand that 'sexual reproduction' just means reproduction from two parents. Contrasting it with asexual reproduction often helps them to understand the difference.	
Suggested activities		Resources	Useful links
<p>Show the class examples of life cycles they have studied. Offspring are formed from two adults. Ask whether human offspring can be formed from one adult. <i>This may lead to discussions on IVF – there are always two parents, but one may be an anonymous donation. Cloning humans has not been carried out, and is illegal anyway. Some animals have been cloned, but this is on a small scale by scientists.</i></p> <p>A living thing which is produced from <b>one</b> parent is called a clone – it is an <b>exact copy</b> of the parent.</p> <p>Animals (with a very small number of exceptions, like stick insects – google parthenogenetic if you have some interested students, but emphasise that only a very few types of animal can do this) can't reproduce on their own. They have to carry out sexual reproduction (which means reproduction from two adults). Plants can carry out Asexual reproduction (reproduction without sex – offspring made from one adult only).</p> <p>Students can try and clone plants – plant potatoes, take cuttings from different places. <i>Potatoes are a store of energy for a plant to get through winter – they are not a seed made from two parents.</i></p>		Plants for taking cuttings* Clean, sharp knife Potting compost Seed trays/containers Root hormone powder Potatoes  *Basil plants from the supermarket work well  Spider plants clone themselves – 'baby' plants sprout at the end of stems – students love to plant these and watch them grow	<a href="https://www.rhs.org.uk/advice/profile?pid=307">https://www.rhs.org.uk/advice/profile?pid=307</a> RHS – how to take cuttings  <a href="https://cleverbloom.com/root-plant-cuttings-water/">https://cleverbloom.com/root-plant-cuttings-water/</a> Great guidance on how to take cuttings in water (which is good for the students to see what is going on). Video suitable for teachers, not for showing to a class

They could plant seeds (which are produced from sexual reproduction – emphasise that pollination happened from another plant), and compare the plants which are produced with those from cuttings.

*You may need hormone rooting powder to help with taking cuttings. Lots of instructions online. This does not 'add' anything to the plants, it's a chemical that 'tells' it to start growing roots. If we put this or any chemicals on animals, it won't make them grow new parts!*

Discussion of sexual reproduction often leads on to much more discussion on the difference between that and 'sex'.

