


### Biosphere Explorers 2: Plant Life Cycles (outdoors, for P4+).

**SCN 2-14a:** By investigating lifecycles of plants and animals, recognise different stages of development.


75 minutes

Time	Activity	Description	Resources/Notes	Benchmark
10 mins	Review of knowledge	<p>Ask your class what we use plants for, and what other uses they have. You can ask them to name types of plants or where they might be found.</p> <p>Discuss what a life cycle is, and what is included in a life cycle.</p>		
10 mins	Germination Game	<p>Using chalk or paper signs (held by pupils), have five stations around a play area/field:</p> <ul style="list-style-type: none"> <li>• Water</li> <li>• Warmth</li> <li>• Oxygen</li> <li>• Roots</li> <li>• Worms</li> <li>• For older classes, you can add soil and fertiliser instead</li> </ul>	<p><b>Paper and pens, or chalk.</b></p> <p>5 signs or stations created (see left).</p>	Investigates and explains how the seed germinates into a plant using water, warmth, food store, and oxygen.

		<p>Shout out one of the stations. Pupils must run to it if they think that seeds need that to germinate. Swap sign holders every so often, and talk about the answers.</p> <p>At the end, ask them what last thing seeds need to germinate that we don't have on the signs (food).</p>		
15 minutes	Growth	<p>In groups or individually, explore an outdoor area that has plant life – even in Winter, you will find grass, trees, bushes, leaves, moss, and lichen.</p> <p>You can divide your class into three groups to look for Winter life, new growth, and flowers – and discuss the cycle of seasons and corresponding life/growth.</p>	No resources needed.	

10 mins	Flowering	<p>Using chalk on suitable ground, draw out a big flower with a stem. Pupils can help you to label the petals and stem.</p> <p>Then, tell your pupils to imagine that we are cutting the flower down the middle to have a cross section. Draw the additional female and male parts, and have students guess which is which (see link).</p> <p>Next, draw pollen on the top of the male parts (stamen). Once pupils have guessed what that is, show how a bee or other pollinator comes to get the nectar at the base of the flower, and brushes past the pollen which sticks to it. The bee then buzzes around pupils before dropping back onto the flower again. Explain how the pollen falls off the bee and onto the female part of the flower (stigma), travels down the pollen tube, and then joins</p>	<p><b>Chalk</b></p> <p>Diagram: <a href="https://schoolgardening.rhs.org.uk/Resources/Info-Sheet/Flower-structure-diagram">https://schoolgardening.rhs.org.uk/Resources/Info-Sheet/Flower-structure-diagram</a></p> <p>For younger pupils, stick with the major parts of the flower – petal, stem, pollen, leaf, and male/female. Older pupils could have more terms introduced if appropriate.</p> <p>You can use a bee toy to help visualise things, or create pollen out of coloured or felt paper with Velcro on the back (make sure to use the side that will stick to clothes). You can stick this pollen onto the toy or onto some clothes to show how it's sticky.</p>	<p>Describes how pollination occurs when the male cell (pollen) lands on the stigma.</p> <p>Describes how fertilisation occurs when the genetic information in the male cell joins with the genetic information in the female cell.</p> <p>Describes how the fertilised ovule develops into a seed and how the ovary ripens to form a fruit.</p>
---------	-----------	--	--	--



		<p>with the female cell. Ask pupils what they think that makes (a seed).</p>		
<p>15 mins</p>	<p><b>Seed Dispersal game</b></p>	<p>The class now know how a seed forms. But the question remains: how does a seed get out of plant and into soil?</p> <p>Divide the class into 3 groups as evenly as possible. Discuss the 3 main types of seed dispersal: wind (e.g. sycamore or 'helicopter' seeds), explosion (gorse or pea plants), and animal dispersal (sticky willow/goose grass – it works like Velcro and sticks to clothes with burrs).</p>	<p>No resources needed.</p> <p>Seed dispersal information:  <a href="https://www.bbc.co.uk/bitesize/topics/zxfrwmn/articles/z28dpbk">https://www.bbc.co.uk/bitesize/topics/zxfrwmn/articles/z28dpbk</a></p> <p>You could include a water dispersal team too, but for the sake of ease we stick to the three main types in this lesson plan.</p>	

# Inspiring action. Repairing Nature.

		<p>Set up a relay race and explain how each team will be moving differently. Team 1 jumps (burst/explosion), team 2 runs with a friend (animal dispersal) and team 3 runs (wind).</p> <p>Team 2 should typically finish first, with team 3 shortly after. Team 1 will usually take a while!</p> <p>You can swap how each team moves so they all get a chance to experience this, and then recap the methods of seed dispersal and the examples.</p>		
5-10 minutes		<p>Have a look at seeds to help pupils visualise what they've just learnt. You can use this time to recap the germination needs as well.</p>	<p><b>2-3 seed examples in clear bags or taped plastic pockets.</b></p> <p>As an extension activity, if you created pollen that sticks to clothes, you could have a game of tag using the pollen to mark who is 'it'.</p> <p>As an extension activity, plant some seeds in pots indoors, like sunflowers, or outdoors like wildflowers. Make sure to use peat-free</p>	



# Inspiring action. Repairing Nature.

			compost ( <a href="https://www.carboncentre.org/post/protect-our-precious-peatlands">https://www.carboncentre.org/post/protect-our-precious-peatlands</a> ). You can refer back to this growing plant as a way to help pupils recall what you learnt in this lesson.	
5 minutes		Recap/move indoors - If drawing a model of the flower outdoors was not suitable, use the board indoors instead at this point.	Optional – Class board and board pens	



This lesson plan is from Crichton Carbon Centre's Biosphere Explorers 2 project, funded by Galloway Glens.

