

## Stage 4: Growing vegetables without seeds

### Learning objective:

To explore ways in which plants reproduce without seeds

### Stage overview:

In this stage, the children learn about asexual reproduction in plants and have the opportunity to research different ways that this can be used artificially by growers. The children will then grow a second vegetable to use in their recipes using one of the methods that have been researched.

This gives them an opportunity to consider the advantages and disadvantages of sexual and asexual reproduction in plants, drawing on their practical experience of growing plants using both methods.

### Materials needed:

- Strawberry plant with runners
- Spring onion root ends
- Compost
- Small plant pots/ yoghurt pots/ cups x30 (labelled for each child/ pair)
- Access to the internet or library for research

### Presentation notes:

Slide 2: Thinking time	<ul style="list-style-type: none"> <li>- Start the children's thinking by displaying the questions on the slide and asking them to discuss them: Thinking back to stage 2, what needs to take place for seeds to be produced? Can you think of any problems that this might cause?</li> <li>- Why might it be useful for plants to reproduce without producing seeds?</li> </ul>
Slide 3: Asexual reproduction	<ul style="list-style-type: none"> <li>- Introduce the concept of asexual reproduction: plant reproduction using seeds is known as sexual reproduction as it involves female and male cells. Some plants reproduce using asexual reproduction which means that only one parent plant is required and, as a result, the offspring plants are genetically identical to the parent and to each other (they are clones).</li> <li>- One of the most amazing things about plants is that every part has the ability to grow into a new clone of the original plant with all its parts and functions. Let's look at strawberry plants to see an example of how this works.</li> </ul>

Slide 4: Strawberry propagation	<ul style="list-style-type: none"> <li>- Talk through the stages of the strawberry propagation diagram to demonstrate how asexual reproduction in plants can occur naturally.</li> <li>- Strawberry plants grow runners in order to produce new plants. Runners are offshoots of the parent plant with their stems growing along the ground. Where the runners make contact with the soil, nodes appear. From each node, a daughter plant can develop, complete with roots and leaves. This daughter plant will be a clone of the parent plant.</li> <li>- Give the children the opportunity to share any experience they have of propagating plants by planting bulbs, taking cuttings or growing potatoes etc.</li> </ul>
Slide 5: Practical application	<b>Task 1:</b> Ask the children to use one of the propagation methods discussed to grow a second crop that they could use to make their product. Re-growing spring onions is a simple way to illustrate this concept.
Slide 6: How to re-grow spring onions	<ul style="list-style-type: none"> <li>- This slide demonstrates the method for re-growing spring onions</li> </ul>
Slide 7: Written application	<p><b>Task 2:</b> Ask the children to research some other vegetable propagation methods and write an illustrated 'how to' gardening guide to provide detailed instructions on growing plants without seeds for a new gardener.</p> <ul style="list-style-type: none"> <li>- Give the children a choice about how to present their gardening guides e.g. they could produce a mini-booklet, tri-fold leaflet, power point, video etc.</li> </ul>
Slide 8: Critical thinking	<ul style="list-style-type: none"> <li>- In mixed ability groups, challenge the children to consider the advantages and disadvantages of sexual and asexual reproduction in plants and lead a debate- style discussion to allow them to share their ideas.</li> </ul>

### Links to the National Curriculum:

Science	Living things and their habitats	<ul style="list-style-type: none"> <li>- Describe the life process of reproduction in some plants and animals.</li> </ul>
	Notes and guidance	<ul style="list-style-type: none"> <li>- Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants</li> </ul>

English	Spoken Language	<ul style="list-style-type: none"> <li>- Articulate and justify answers, arguments and opinions</li> <li>- Maintain attention and participate actively in collaborative conversations, staying on topic and initiating and responding to comments</li> <li>- Use spoken language to develop understanding through speculating, hypothesising, imagining and exploring ideas</li> <li>- Speak audibly and fluently with an increasing command of Standard English</li> <li>- Participate in discussions, presentations, performances, role play, improvisations and debates</li> <li>- Gain, maintain and monitor the interest of the listener(s)</li> <li>- Consider and evaluate different viewpoints, attending to and building on the contributions of others</li> </ul>
	Writing composition	<ul style="list-style-type: none"> <li>- Plan their writing by identifying the audience for and purpose of the writing, selecting the appropriate form and using other similar writing as models for their own, noting and developing initial ideas, drawing on reading and research where necessary</li> <li>- Draft and write by selecting appropriate grammar and vocabulary, understanding how such choices can change and enhance meaning, précising longer passages, using a wide range of devices to build cohesion within and across paragraphs, using further organisational and presentational devices to structure text and to guide the reader [for example, headings, bullet points, underlining]</li> </ul>

