



## 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> <li>- They could also use video creation tools such as Quik or iMovie on a tablet to create their guide. The children could record four to five 20 second videos, add them to the video editor app and edit by trimming, adding titles and narration 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  Notes and guidance	<ul style="list-style-type: none"> <li>- Describe the life process of reproduction in some plants and animals.</li> <li>- Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants</li> </ul>
Computing		<ul style="list-style-type: none"> <li>- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.</li> </ul>