Plants Scientific Knowledge

Introduction

As part of the new framework, OFSTED inspectors will evaluate the extent to which "Teachers have a good knowledge of the subject(s) and courses they teach". This guidance has been provided to help you develop a broader knowledge of the concepts in this area of science and not just of the content taught in year 1. This will help you to anticipate and answer questions the children may pose. Alongside this, we have also provided some examples of the possible misconceptions you may find the children have.

Lesson	Scientific Knowledge	Possible Child Misconceptions
Lesson 1 Making Observations	Seeds are formed after the plant is pollinated. The seed contains the plant embryo and a food store, so the plant can start to grow. Germination is the process by which plants start to grow. The seedling will use the food in the seed's food store until it is able to make its own food through photosynthesis. Plants that grow from seeds tend to be annuals (complete life cycle within a year), biennials (complete life cycle across two years) or perennials (live for many years). Plants with asexual reproduction can grow from bulbs, tubers or runners. In asexual reproduction, there is only one parent plant. The new plants are clones. Bulbs and tubers develop underground. They are food storage organs that will grow next year's plant. Examples: onions are bulbs and potatoes are tubers. Plants like strawberries can grow from runners. The new plant on the runner is a called a plantlet.	Children may not associate the seed with a growing plant. This could be addressed by also growing something like cress in a plastic cup on cotton wool. This would allow the children to observe germination.

Lesson 2 Parts of a Plant	Roots - the part of the plant that lies below the ground. • Roots anchor a plant in the soil. • They also transport water and nutrients from the soil. • They store nutrients for future use. Stem - generally found above the ground. • The stem holds the leaves and the flower in the best position for, for example, catching sunlight. • The stem also transports water and nutrients to the leaves and other parts of the plant and sugar is transported from the leaves. Leaves - found above the ground. • Photosynthesis is a chemical reaction that takes place in the leaves, producing food (glucose) for the plant Light, carbon dioxide and water are all needed for photosynthesis. Flowers - the reproductive part of many plants. • During pollination, the pollen from the anther is transferred (by wind, water, insects, birds or other animals) to the stigma. It may be transferred to a different plant or to the same plant (self-pollination). Fruit: • Fruit is produced by the female part of the plant, after fertilisation. Fruit can be fleshy (such as berries and apples) or hard (such as nuts).	Children may think that plants are not living things. This can be addressed in year 1 by drawing attention to the fact that plants grow and need water. If 'food' is discussed for plants, it is important that children realise that plants do not eat like animals do. Some children may mention plant food. It would be useful to clarify that plant food is useful to help plants to grow, but they do not need it as they make their own food.
Lesson 3 Garden and Wild Plants	Garden plants are those that are cultivated by humans. There are many plants that could be considered to be both wild and garden plants - ivy and grass are just two examples.	Children may be a little confused about some plants being considered both wild and garden plants. It is important that children understand that the difference between the two is the involvement of humans in their growth.

Lesson 4 Terrific Trees	Deciduous trees lose their leaves to conserve resources over the winter months. Evergreen trees have a thick, wax-like coating on their leaves that protects them from the cold weather. Although they don't lose leaves as deciduous trees do, they do lose some leaves sporadically over the year.	As there is a physical difference between smaller plants and trees, children may think that trees are not plants. They may also find it difficult to relate the parts of a plant to the parts of a tree. Drawing comparisons between different plants and trees (such as a sunflower and a tree) may help with this.
Lesson 5 Fruit and Vegetable Plants	Fruit is the ripened ovary of a plant. Fruit only grows after the plant has been fertilised. Fruit contains seeds. Some foods that are often thought to be vegetables are actually fruit, for example peapods (the pod is the fruit and the peas are seeds), cucumber and tomatoes. Vegetables can come from many parts of the plant. This includes bulbs, tubers, stem, leaves and flowers. The key thing to remember is that vegetables do not have seeds.	The culinary distinction of fruit is different from that of botanists. Children may need some support in understanding that fruit have seeds (unless grown by humans without seeds) and that fruit is not always sweet.
Lesson 6 Comparing Plants	All living things are classified by scientists according to their structures or characteristics.	Children should be looking for similarities in the groups they create. This does not have to be the taught classifications for plants, as long as children can explain the characteristics, structures or features that the plants have in common.