## Biology Unit: Plants

What does progression of knowledge look like?

| Year | Progression of knowledge. |
|---|---|
| 1 | • Flowering plants have a root, stem, leaves and a flower<br>• Trees can be deciduous which means the leaves are lost yearly- usually in the autumn<br>• Trees can be evergreen which means there are always leaves on the tree (leaves are continually replenished throughout the year<br>• Trees and plants have roots, stems and leaves but plants have a softer stem<br>• Trees are made of roots, trunk, branches and leaves.<br>• Grasses and ferns consist entirely of leaves.<br>• In autumn, the leaves on deciduous trees change colour, fruits and nuts fall to the ground. Farmers can harvest the crops.<br>• In Spring, birds sing, trees produce leaves and flowers blossom and the landscape changes<br>• Trees are examples of plants |
| 2 | • Plants can grow from seed or bulbs<br>• Seeds and bulbs germinate and grow into seedlings<br>• Seedlings grow into mature plants<br>• Plants need light, water, space, suitable temperature in order to grow<br>• Some plants grow best in full sun<br>• Some plants grow best in the shade<br>• Some plants need lots of water<br>• Some plants don't need much water<br>• Some plants grow quicker than others. |
| 3 | • Plants contain roots to absorb water and nutrients from the soil<br>• Plant roots also anchor the plant to provide support<br>• Plants contain a stem/ trunk which is responsible for transporting water and nutrients around the plant.<br>• Plants contain flowers which contain the stamen, carpel, petal, ovule, sepal and stem<br>• Plants need light, water, space, suitable temperature in order to grow<br>• The level of nutrients required depends on the type of plant<br>• Insects like bees and wasps transfer the pollen from the male part of a flower to the female part of other flowers<br>• Seeds can also be dispersed by wind, animal fur, animals eating them (and excreting them), in water and if the seed pod explodes<br>• The roots absorb water from the soil, the stem transports it to the leaves, water evaporates from the leaves which causes more water to be absorbed from the soil |
| Key Stage 3 (7-9) | • Draw and label a plant cell<br>• A plant cell has a cell wall, chloroplasts and vacuoles- and animal cells do not (inc. functions)<br>• Label a diagram of plant organs and state the function of each of the organs<br>• Name specialised plant cells, tissues and organs, stating their functions<br>• Describe how to prepare and view and onion skin slide in microscopy<br>• Identify biotic and abiotic factors in an ecosystem<br>• Identify causes of environmental change and understand seasonal and daily changes in plants<br>• Describe how plants compete<br>• Describe what herbicides and pesticides are used for (and their advantages/ disadvantages inc. bioaccumulation)<br>• Understand that plants are producers in a food chain |
| | • Understand the role of plant-based food related to nutrition<br>• Plants and other organisms can be classified according to their similar appearances<br>• Plants have scientific names according to their classification<br>• Explain sexual and asexual reproduction in plants (including hybrids)<br>• Describe inherited variation in plants<br>• Identify the parts of a flower<br>• Explain cross and self-pollination and how fertilisation leads to the formation of a seed.<br>• Investigate seed dispersal<br>• Describe the stages of germination |
| | • Know that photosynthesis is required for plants to produce glucose in order for respiration to occur and so the plant can make cell walls, membranes or store it as starch, seeds, oils in order to help it survive<br>• Describe the adaptations of a leaf and the features of efficient gas exchange<br>• Root hair cells absorb water and minerals in the roots of plants and describe the importance of K and Na ions and nitrates.<br>• Xylem tissue in the stem transports water to the leaves of the plant. Describe how xylem vessels are adapted for their function<br>• Phloem transports a solution containing sugars and ions from the leaves to the plant<br>• Investigate the production of starch in plants<br>• Relate crop yield to the work of a farmer and evaluate the use of fertilisers, pesticides and clearing land<br>• Evaluate organic and intensive farming and how different aspects of farming affect the Carbon Cycle |