Medium Term Plan
Plants

P levels
Performance attainment targets (P scales) and performance descriptors are used for pupils aged 5 to 16 with special educational needs (SEN) who are working below the standard of the national curriculum tests and assessments. PSTT recognises that the national curriculum levels used in this document are no longer current. We have had so many requests to return these materials to the website that they remain in the documents as a guide for those who have used them in the past. The written statements may be useful to others as an indication of children's development. For further information about P levels see: https://www.gov.uk/government/publications/p-scales-attainment-targets-for-pupils-with-sen

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Primary Science Teaching Trust recommends that a full risk assessment is carried out before undertaking in the classroom any of the practical investigations contained in the plans.

Safety Note
PSTT advises teachers to refer to either CLEAPSS website or SSERC website for up to date health and safety information when planning practical activities for children.

Teacher's Notes: Plants

Big Questions

- What do different plants have in common?
- What makes plants special?
- What is a plant?
- Can we live without plants?
- Do plants feed?
- Are all leaves green?
- Can plants hear?
- Are plants coordinated?
- Are plants dangerous in the bedroom?
- Do plants have sex?
- Do plants ever move?
- What do plants need and why?

Answers

- With the exception of parasites, most plants produce their own food: they are autotrophs.
- Most plants photosynthesise: they contain a pigment called chlorophyll.
- A plant is a multicellular organism: its cell walls contain cellulose. Note - fungi and algae are not plants.
- Plants are essential because they produce the food that animals and humans need for growth and energy.
- Most plant leaves are green because they contain a pigment called chlorophyll. Some leaves look red/purple because they also contain other chemicals but chlorophyll is still there.
- Plants cannot hear as we do but they are sensitive and react to temperature changes, wind, light and even human touch.
- Plants can coordinate movement in response to plant hormones.
- In the dark, plants respire so they take in oxygen and release carbon dioxide but the amounts are very small and will not be dangerous.
- Plants have male and female parts so they can reproduce sexually but they do not 'have sex'.
- Plants can move towards or away from different stimuli: light, gravity, water, chemicals and touch.
- Plants need oxygen for respiration (all the time) and carbon dioxide, water and light for photosynthesis (some of the time).

Learning Objectives

Pupils will have opportunities:

- To explore the parts of a plant
- To begin to link different parts of a plant with their function
- To explore plant reproduction and growth
- To recognise what plants need to keep healthy

Quick review activities

- Attach labels or symbols to plant parts
- Listen to They Might Be Giants - C is for conifers http://www.youtube.com/watch?v=FijQbZeTGNc
- Listen to They Might Be Giants – Photosynthesis http://www.youtube.com/watch?v=LgYPeeABoUs
- Needs of a plant song http://www.schooltube.com/video/7ef63fe536015231930c/
- Draw a poster to show what a plant needs to keep healthy
- Nursery rhyme song eg 'Mary Mary quite contrary' – pupils to select equipment and water plant
- Pupils take a sequence of photos and create a diary of the growth of the plants
- Pupils use counting bricks to measure the growth of the plant and record results
- Pupils to sequence photos of a field, tree over the four seasons

Vocabulary relevant to this topic

- Photosynthesis – series of chemical reactions by which green plants make their food from carbon dioxide, water using energy taken from sunlight.
- Stamen – male part of the flower
- Pollen – male sex cells
- Anther –part where pollen is made
- Carpel – female part of flower
- Stigma – female part of flower, landing site for pollen
- Ovary - female body containing the ovules (female sex cells)
- Sepal – protects flower in bud
- Stem – contains small tubes to carry water and sugar round plant
- Transpiration – loss of water by evaporation through the leaves
- Petal – brightly coloured, sometimes smelly, part of plant to attract insects: makes the flower
- Seed – embryo plant and food store in protective coat
- Roots – hold plant in ground and absorb water

- water, grow, wet, dry, space, yellow, pale, thin, spindly, conditions
- light, dark
- flower, leaves, leaf, trunk, branch, bulb
- shape, size, colour, smell, texture

Background information about this topic

- Green plants are multi-cellular organisms that contain chlorophyll and make own food by photosynthesis. They include:
- mosses and liverworts – have simple leaves/ leaf form and reproductive spores
- ferns – have proper roots and stems with leaf like fronds and reproduce with spores
- conifers – large plants with seed bearing cones e.g. pine, fir
- Flowering plants – the largest group of plants with seed bearing flowers. Can be divided into monocotyledons e.g. grass, iris and dicotyledons e.g. foxglove, oak.
- Although algae look like simple plants and do photosynthesise, they are not because they can be unicellular or colonial as well as multicellular. Also they do not have leaves, stems or roots, nor do they have a vascular system.
- Fungi are not plants either because they do not photosynthesise.
- Some plants that were around when dinosaurs were include cycads, horsetails, gingko (maidenhair tree), ferns, liverworts and mosses.
- It is not easy for pupils to appreciate that plants are living things nor that plants manufacture their own food. Pupils often think that plants require food to live because of they see bottles and packets of 'plant food' - they do need essential vitamins to grow well just like humans need vitamins. The process of photosynthesis turns carbon dioxide (which enters through the leaves) and water (which enters through the roots) into glucose (sugar) using the energy from sunlight which is trapped by the chlorophyll. Many pupils and adults find this counter intuitive because it is hard to imagine a liquid and a gas making solid parts of plants such as wood. The rate of photosynthesis can be affected by the temperature, amount of light, colour of light, amount of water and amount of carbon dioxide. The leaf is the main part of the plant where photosynthesis takes place and they are often wide and flat to trap as much sunlight as possible, darker green on the upper surface because chlorophyll is concentrated there and have small holes (stomata) to allow for gas exchange and also transpiration of water.

- Some of the sugar is used by the plant in respiration so that the plant can grow, function and develop. Minerals are also needed to make new cells. Plants are able to use nitrogen and glucose to make protein. They can also turn glucose into cellulose, fats and oils.
- Plants respire all the time, including during the day, so it isn't true to say plants just photosynthesise during the day – they also respire BUT they produce more oxygen than they use.
- When plants die the chemicals they contain are recycled to maintain a chemical balance. Plants are an integral part of the natural cycles for nitrogen, carbon and phosphorus.
- Plants can reproduce in two ways - sexually and asexually. The ones with sweet smelling, colourful flowers reproduce by insect pollination whereas dull, green, flowers e.g. grass rely on wind pollination. These are both forms of sexual reproduction. Some plants reproduce asexually by producing runners e.g. strawberries, small plants e.g. Mexican hat plant, or by using bulbs/ corms/tubers. Plants can be made to reproduce asexually by taking cuttings, layering or grafting.

Plants P1-3

Objective 1: To explore the parts of a plant

Descriptions of intended outcomes at different levels of attainment

- Tolerates touching plants or part of them (P1i)
- Shows random fleeting response to a different plant parts (P1ii)
- Accepts and engages in coactive exploration of plant parts (P2i)
- Shows more consistent and differentiated response to the same experience (P2ii)
- Begins to communicate intentionally actions or gestures e.g. to touch particular plants or seeds (P3i)
- Actively explores using all senses with support (P3ii)

Plants P1-3

Objective 1: To explore the parts of a plant

Possible Activities:	Resources:
Pupils to experience moving through leaves outside the classroom or use a fan/cool hairdryer on a tray of leaves inside the classroom Film pupils responses to the moving leaves activity and show to pupils after the activity	Autumn leaves, trays Fan, hairdryer

Optional activities you might like to try include:	Resources:
Pupils to experience touching different types of seeds	Coconuts, conkers, acorns, lettuce seeds, corn on the cob, mango stone, avocado stone
Pupils experience touching different parts of a plant – stems, flowers, roots	

Points to Note:

Pupils at this level are often unaware of other living things so they need this wider experience.

If using desk fan ensure it has been checked and that students keep fingers away from it.

Piles of different types of leaves make different sounds.

Watch that pupils do not try to eat seeds.

Plants P1-3

Objective 1: To explore the parts of a plant

Possible Activities:	Resources:
Pupils explore feely-bags/boxes containing a variety of leaves eg furry, smooth, crisp and dry, large veined	Leaves of different textures e.g. African violet, monkey puzzle, holly, fir, lambs' ears (stachys) , grass, savoy cabbage, wheat just before harvest,

Optional activities you might like to try include:	Resources:
Pupils to experience different types of lettuce leaves	Romaine , round and iceberg lettuce, endive, radicchio, Lollo Rosso lettuce, chard, spinach, rocket, water cress.
Pupils to experience the smell and possibly taste of herbs	

Points to Note:

Be aware that some plants can be sharp or prickly

Be aware some common houseplants may be poisonous e.g. ivy , lilies,

Plants P1-3

Objective 1: To explore the parts of a plant

Possible Activities:	Resources:
Pupils to make crayon rubbing of leaves . Look closely at patterns of veins.	Leaves, wax crayons, paper

Optional activities you might like to try include:	Resources:
Pupils to sort leaves e.g.by colour/size/shape with support and create a pictogram (using real leaves) to show the number of each type in a tray	Selection of leaves, large paper, glue/paste.
Pupils to look at the roots of different plants. Are they all the same? They can try pulling weeds up to see if they are easy or hard to pull up – do roots stay in the ground or stay attached to the plant?	

Points to Note:

Beware of pupils ingesting `found` leaves.

Which leaf am I game? – adult says which leaf has....? e.g. 'smooth edge' and pupils select from actual specimens or photos.

Plants P1-3

Objective 2: To begin to link different parts of a plant with their function

Descriptions of intended outcomes at different levels of attainment

- Is present during the experience but shows no or just reflex response (P1i)
- Shows intermittent response to different scents (P1ii)
- Changes body language in a more sustained way e.g. smiles when sitting under trees (P2i)
- Gathers further sensory evidence by smelling for a short but sustained period when presented with scented plants (P2ii)
- Positively or negatively anticipates event e.g. covering head when watering plants (P3i)
- Responds to options and choices e.g. selects a plant to smell or not smell (P3ii)

Plants P1-3

Objective 2: To begin to link different parts of a plant with their function

Possible Activities:	Resources:
Compare pond plants with local and plants either from school pond or local garden centre. E.g. shape and thickness of leaves, rigidity of stem, size of roots if any. Use magnifiers to look at pond plants that have all parts submerged and which oxygenate the water. Can they see any bubbles coming off the plant e.g. goldfish weed? Pupils could try the plant in dim and bright light to see if there is a difference – video the plant.	Examples of pond plants that grow on edge or completely in water e.g. water lily, duck weed, rushes, starwort, magnifiers

Optional activities you might like to try include:	Resources:
Set up a bog garden in area of school grounds or in a large plastic container https://www.edenproject.com/learn/for-everyone/how-to-make-a-bog-garden Talk about the conditions the plants need. It might be useful to keep one or two bog plants in deep water to see the effect – this is like water logged ground.	Area to create bog garden, pond liner, selection of bog plants,

Plants P1-3

Objective 2: To begin to link different parts of a plant with their function

Compare plants that survive dry conditions to local land plants and watch clip below http://www.bbc.co.uk/learningzone/clips/how-cacti-survive-in-the-dry-desert/66.html Measure a dried up indented type of cactus and measure the height, diameter and angle between indents. Soak in bowl of water for 24 hours and then re-measure everyday over next week.	

Points to Note:

Aquatic plants are less rigid as they rely on the water to keep them upright. Some have huge flat leaves. Many do not have roots and they instead absorb nutrients through their leaves. Water plants such as bladderwort have visible air sacs that help them stay afloat and capture food. Tiny aquatic life trapped and digested in each bladder provides the plant with nourishment.

Plants P1-3

Objective 2: To begin to link different parts of a plant with their function

Possible Activities:	Resources:
Compare the growth of plants when the soil is covered/uncovered and watered. Try inside and outside the classroom.	Cling film/plastic disc to cover soil, water, healthy plants.

Optional activities you might like to try include:	Resources:
Cover an area of grass with black plastic and clear plastic and examine regularly. Photograph the change over a week.	plastic sheets/bin bags, camera

Plants P1-3

Objective 2: To begin to link different parts of a plant with their function

Possible Activities:	Resources:
Show video clip of plants swaying on a windy day or simulating a windy day using a fan in class on tall plants e.g geraniums. Compare weeds with roots and with roots removed over a couple of days.	Desk fan, geraniums, weed plants – possibly in pots so can be in the classroom

Optional activities you might like to try include:	Resources:
Show pupils photos of building that have sedum roofs. Feel different leaves to make pupils aware of way layer. Find out which leaves make the best roofing material.	Selection of different leaves form local trees, glue or staples to fix leaves to roof, card to make roof, watering cans to mimic rain
Explore Air Plants http://plants.web-indexes.com/airplants/airplant-basics.html What happens if they are not watered? Can the roots be removed?	

Points to Note:

If using desk fan ensure it has been checked and that students keep fingers away from it

Plants P1-3

Objective 3: To explore plant reproduction and growth

Descriptions of intended outcomes at different levels of attainment

- Tolerates touching seeds and vegetables (P1i)
- Focuses attention on seeds for short periods of time (P1ii)
- Begins to show interest in the activities (P2i)
- Performs actions often by trial and improvement e.g. trying to touch seeds in fruit (P2ii)
- Remembers some learned response for longer e.g. intentionally revisits an experience like picking up a vegetable or putting hands in sprouting seeds (P3i)
- Responds to options and choices with actions/ gestures e.g. touching one fruit or vegetable in preference to another (P3ii)

Plants P1-3

Objective 3: To explore plant reproduction and growth

Possible Activities:	Resources:
Encounter fruit being cut open to show seeds inside. Touch seeds.	Pumpkin, melon, apples, oranges, pears, plums, mango, avocado

Optional activities you might like to try include:	Resources:
Encounter different vegetables by feeling shape and texture	Carrots, cabbage, potatoes, onion, courgette, egg plant
Encounter different sprouted seeds and beans by placing them on trays. If appropriate could encounter the dried seeds first e.g. spread on tray or shake in jar	

Points to Note:

Some pupils may be resistant to touching fruit

Plants P1-3

Objective 3: To explore plant reproduction and growth

Possible Activities:	Resources:
Drag an old jumper through undergrowth and look at the seeds that stick to it. Plant some of the seeds to see if they grow	Old woollen jumper, pots, compost

Optional activities you might like to try include:	Resources:
Explore how some seeds are dispersed by wind. Try dropping different seeds and blowing with a hair dryer or fan to see how far they go. If appropriate pupils can try attaching wings to a seed to see if makes a difference.	Sycamore seeds, ash keys, dandelion heads, fan or hairdryer, selection of other seeds, glue, thin card cut into wing shapes,
Explore how some seeds are dispersed by water e.g. coconuts, water plants. Try floating different seeds on water to find out which float. Show pupils what happens to seeds left in water for a few days. Explain that need to find something that might help seeds last longer in water. Try coating seeds and then leaving some in water and some in soil for a week. What happens? Do they rot? Do they still germinate?	

Points to Note:

http://www.bbc.co.uk/learningzone/clips/seed-dispersal/2258.html
might be a useful clip to show pupils

Plants P1-3

Objective 3: To explore plant reproduction and growth

Possible Activities:	Resources:
Place seeds, facing different directions in a plastic bag or clear container. Observe how shoots and roots grow. Do seeds have a right way up?	Large seeds e.g. broad beans or runner beans, plastic bag, compost

Optional activities you might like to try include:	Resources:
Find out if the depth of planting a seed affects its growth.	Compost, pots, pea seeds, water
Find out if seeds need light to germinate	

Points to Note:

Ensure beans are not ingested and that students wash their hands after handling them.

Plants P1-3

Objective 3: To explore plant reproduction and growth

Possible Activities:	Resources:
Dissect a simple flower and label petals, where pollen is made and where seeds are made. Watch video clip of insects landing on flowers. Pupils to create collage of variety of plants and visiting insects	Gladioli, carnations, daffodils, pea flowers, paper, sellotape, coloured paper, flower pictures, insect pictures

Optional activities you might like to try include:	Resources:
Look more closely at flowers - do they all have the same number of petals? With help arrange flowers in order of number of petals	Range of different flowers, unifix cubes to count number of petals
Explore pollen by touching stamens of different plants with a paint brush and putting on paper. Is it the same colour? Does it look the same? Look at some pollen using a magnifier or photograph using digital microscope. Talk about what pollen could be like if it has to attach to insects	

Points to Note:

Ensure flowers are not ingested and that students wash their hands after handling them.

Plants P1-3

Objective 3: To explore plant reproduction and growth

Possible Activities:	Resources:
Dissect, display and label flowers to show different parts. Compare different flowers to see if they have the same parts. Talk about what happens during pollination Take cuttings from different plants and compare how they grow. Does the soil make a difference? Does rooting powder help?	Selection of flowers, paper, sellotape, labels/ symbols to attach to flower. Geraniums, lavender, rosemary and other plants to use for cuttings. Small pots, soil/ compost, rooting powder

Optional activities you might like to try include:	Resources:
Compare a wind pollinated flower with an insect pollinated one. Look at plants that reproduce by producing small versions of themselves or use a swollen stem, leaf or root to carry them over the winter	Grass flower or catkins or other wind pollinated flower, rose or other insect pollinated flower. Spider plant, Mexican hat plant, strawberry plant, bulbs and tubers
Visit natural environment. Observe which part of the plant insects land on and head for. Carry out a survey on different flowers to see which attract the most insects.	

Points to Note:

https://www.bbc.com/bitesize/clips/zmrb4wx
This is a useful clip showing insect pollination

Plants P1-3

Objective 4: To recognise what plants need to keep healthy

Descriptions of intended outcomes at different levels of attainment

- Is present during the experience but shows no or just reflex response (P1i)
- Shows intermittent responses to the different plants (P1ii)
- Accepts and engages in coactive or shared exploration (P2i)
- Communicates consistent preferences /dislikes for particular plants (P2ii)
- Explores plants in increasingly complex ways and/or for longer periods of time (P3i)
- Selects or chooses the plant to 'record' result e.g. plant that shows result if no water or light (P3ii)

Plants P1-3

Objective 4: To recognise what plants need to keep healthy

Possible Activities:	Resources:
Visit sensory garden or create own indoor garden using herbs or other fragrant plants	Scented plants e.g rosemary, thyme, basil lavender

Optional activities you might like to try include:	Resources:
Experience scents from different flowers include some with little or no scent (check that cut flowers do have scents)	Scented flowers include -roses, freesia, honeysuckle, mimosa (acacia), jasmine, lily, lilac, lily of the valley
Experience touching Tickle me plants and also different types of bark	

Points to Note:

Pupils at this level are often unaware of other living things so they need this wider experience

Some pupils may have allergies e.g hay fever

Plants P1-3

Objective 4: To recognise what plants need to keep healthy

Possible Activities:	Resources:
Pupils experience sitting under trees e.g. sounds of leaves, sunlight coming through leaves, shade	Trees in school grounds or local park

Optional activities you might like to try include:	Resources:
Pupils experience long and short grass –maybe using whole body or hands and feet	Access to area of mown or unmown grass outside or if not possible samples of turf on Tuff spots or large trays
Pupils experience a visit to a garden centre or create one in school using lots and lots of different pot plants	

Plants P1-3

Objective 4: To recognise what plants need to keep healthy

Possible Activities:	Resources:
Pupils experience touching plants Pupils experience plants being watered using different ways. For pupils who can imitate the use of a hose pipe, learning when to stop watering Pupils visit an outside space, a garden centre, allotment or a market The routine of watering a plant could be associated with a personal (self care) such as drinking water after a snack	Healthy and less healthy plant samples. Rain, hose pipe, different attachments for hose pipe, inside and outside watering cans, umbrellas

Optional activities you might like to try include:	Resources:
Provide pupils with plants that have been growing in the light and ones that have been growing in the dark Experience feeling different wet and dry soil	Plants grown in light and dark. Soil, large trays or pots, water
Provide pupils with plants that have been grown with water and left with no water Experience feeling different soils and growing media	

Points to Note:

Pupils may not be aware that too much water will kill the plant.
Some pupils may have allergies.
Remember to wash hands after these activities.

Plants P1-3

Objective 4: To recognise what plants need to keep healthy

Possible Activities:	Resources:
Find out if sunflower seeds prevent germination of other seeds Or Find out if plants grow differently in artificial light.	Sunflower seeds, carrot seeds, cress seeds, bean seeds, quick growing brassicas. Grown living cress or lettuces from a supermarket. compost, pots.

Optional activities you might like to try include:	Resources:
Find out if plant 'food' affects growth by planting seeds in washed sand. Water some with distilled water and some with distilled water plus drops of babybio as directed on label. Compare how they grow	Plant food like baby bio, washed sand, pots, bean or maize seeds, distilled water
Find out if different plant 'foods' make any difference to plant growth using the same approach as in revisit 1 but vary the plant 'foods' used.	

Points to Note:

Remind pupils not to eat seeds and to wash hands after activity

Washed sand can be purchased from builders yards or garden centres. The washing removes any silt, soil or clay that could provide nutrients to the plants.

Plants P4-6

Objective1 : To explore the parts of a plant

Descriptions of intended outcomes at different levels of attainment

- Shows interest in activities and explores using vocalisation (P4i)
- Makes simple choices about which leaves/plants to touch (P4ii)
- Anticipates or begins to initiate activities with support (P5i)
- Responds to simple instructions involving more than one step e.g. “pick the plant part to grow and put it in water” (P5ii)
- Begins to show an awareness of treating things in the same way e.g. using the same hand lens to look at different leaves (P6i)
- Communicates what they have done with support (P6ii)

Plants P4-6

Objective 1 : To explore the parts of a plant

Possible Activities:	Resources:
Pupils to look for and collect leaves from their local environment/park Pupils to observe the leaves they have collected using a visualiser/OHP Create a leafy table for pupils to explore using hand lenses with support	Leaves, visualiser, hand lenses

Optional activities you might like to try include:	Resources:
Make a collection of plants that humans eat Explore 'Tickle me' plants	Cabbage, carrot, beetroot, corn on the cob, beans, cauliflower, herbs. Tickle me plant seeds, pots, compost
Make a collection of plants that can be harmful to animals – use photos if examples not available. Not all plants affect all animals Try growing plants from different parts of a plant that are often discarded when preparing vegetables	

Points to Note:

Be aware some common houseplants may be poisonous e.g. ivy , lilies.

Be aware that some plants can be sharp or prickly .

Plants P4-6

Objective 2: To begin to link different parts of a plant with their function

Descriptions of intended outcomes at different levels of attainment

- Follows a simple procedure with step-by-step support to gather evidence (P4i)
- Responds to prompts to observe sensory based outcomes of an experiment (P4ii)
- Indicates a before and after of changes in plants (P5i)
- Responds to simple scientific questions e.g. what colour is the leaf? (P5ii)
- Completes a procedure following simple instructions (P6i)
- Responds to simple scientific questions that require a more detailed response than P5 e.g. what has changed? (P6ii)

Plants P4-6

Objective 2: To begin to link different parts of a plant with their function

Possible Activities:	Resources:
Observe or take part in watering plants using different containers. Emphasise that we water the soil and not the leaf/stem. Let pupils try watering two similar plants from the top and the bottom to see if it makes any difference.	Various plants, trays, indoor and outdoor watering cans, jugs, measuring cylinders

Optional activities you might like to try include:	Resources:
Plant small seedlings or re-pot plants. Emphasise roots in the soil and leaves above the soil and preventing root damage. Demonstrate what happens to plants when roots are damaged during transplanting.	Pots, compost, seedlings, other plants.
Keep carnivorous plants in the classroom for pupils to observe. Watch You Tube videos e.g. https://www.youtube.com/watch?v=ktIGVtKdgwo	

Points to Note:

Some gardening books recommend that African violets, streptocarpus (Cape primrose), Sansevieria (Snake Plant), sundew and other carnivorous plants are watered from the bottom.

Plants P4-6

Objective 3: To explore plant reproduction and growth

Descriptions of intended outcomes at different levels of attainment

- Follows a simple procedure with step-by-step support to gather evidence (P4i)
- Imitates actions e.g. taking cutting (P4ii)
- Follows a more complex experiment with a range of prompts (P5i)
- Indicates where similar changes have happened e.g. all sprouting seeds have roots (P5ii)
- Begins to make connections e.g. between soaked bean seeds and faster growth (P6i)
- Engages in experimentation using familiar equipment e.g. seeds, pots, soil (P6ii)

Plants P4-6

Objective 3: To explore plant reproduction and growth

Possible Activities:	Resources:
Grow soaked and unsoaked bean seeds. Is there a difference to how fast they grow? Cut open bean and pea seeds to show that there isn't a curled up plant there	Broad bean seeds; blotting paper, jars,

Optional activities you might like to try include:	Resources:
Grow seeds on different media and see if it makes any difference Demonstrate taking a cutting from a geranium – pupils to copy and do own	Small pots, cotton wool, sand, soil, vermiculite, sawdust, cress seeds,
Grow different sprouting seeds in jars Cut fruit to find seeds inside and then plant them. Record using photographs	

Points to Note:

Geranium plant cuttings should root easily and not need rooting powder.
http://www.wikihow.com/Propagate-Geraniums-from-Cuttings

Plants P4-6

Objective 4: To recognise what plants need to keep healthy

Descriptions of intended outcomes at different levels of attainment

- Communicates awareness of some obvious changes in the plants (P4i)
- Responds to prompts to observe sensory based outcomes of an experiment (P4ii)
- Completes a simple task with guidance e.g. putting plants in different places (P5i)
- Indicates the before and after of plant changes (P5ii)
- Recalls the stages in the experiment as it is carried out (P6i)
- Records using the plants e.g. places the one that had no water or light on the symbol that shows no water or light (P6ii)

Plants P4-6

Objective 4: To recognise what plants need to keep healthy

Possible Activities:	Resources:
Grow plants in the light and dark and observe what happens. Eg cover a small area of grass with black plastic. Remove to observe the effect after a few days Pupils use descriptive symbols i.e yellow, green, healthy, unhealthy to record the differences between plants	Identical plants e.g. geranium, water, dark cupboard or black paper Or use a shoe or egg box, with top left half open and plant in the box or 'egg compartments'. Photos of plants grown in dark and light

Optional activities you might like to try include:	Resources:
Grow two identical plants – water one and leave the other dry. Observe what happens e.g. pupils take a sequence of photos of the plants	Identical plants e.g. geranium, begonia, water Digital cameras Photos of watered and non watered plants Happy and sad visual prompts
Grow two identical plants in a warm and cold place. Observe what happens Grow your own lawn in the classroom using some of the things pupils know that plants need	

Points to Note:

If plant is put in fridge for cold this also makes it dark!
If black plastic is used outside the classroom, secure safely to prevent the hazard of tripping.

Plants P7-8

Objective 1: To explore the parts of a plant

Descriptions of intended outcomes at different levels of attainment

- Communicates simple observations either verbally or with symbols (P7i)
- Makes simple records of findings e.g. pictorial or photographic/video (P7ii)
- Contributes to planning an investigation e.g. by suggesting something to change (P8i)
- Makes or indicates suggestions about what they have found out e.g. which flowers lasted longest (P8ii)

Plants P7-8

Objective 1: To explore the parts of a plant

Possible Activities:	Resources:
Survey flowering plants in school ground or local park. Can be grouped by colour or size and done on screen of photos have been taken	Trays to collect flowers, cameras to take photos of flowers

Optional activities you might like to try include:	Resources:
Find out which flowers last longest in water. Does it make any difference adding substances to water? Or putting in coke?	Different flowers, sugar, baby bio, bleach, coke, water, beakers/ pots
Compare artificial and real flowers. Show how a tulip stem will straighten if a small pin is put through it just below the head. Find out if this works for other plants. Does this or cutting bottom off the stem either straight or at angle or bashing ends of stems make a difference to how long flowers last?	

Points to Note:

Some pupils don't think trees, weeds or vegetables are plants

Plants P7-8

Objective 2: To begin to link different parts of a plant with their function

Descriptions of intended outcomes at different levels of attainment

- Makes simple record of observations (P7i)
- Begins to respond to encouragement to repeat or modify tasks e.g. use less soil or water when carrying out plan experiments (P7ii)
- Locates the right equipment to use for simple investigations e.g. seed trays, compost/soil, seeds and watering can (P8i)
- Notices when something has not worked and tries a different approach or suggests a way to improve it e.g. putting seeds in warmer place to help them grow (P8ii)

Plants P7-8

Objective 2: To begin to link different parts of a plant with their function

Possible Activities:	Resources:
Pupils compare two identical plants, cut the roots off one and water both as normal. Make a simple record of what happens . Compare it to putting a paper towel in coloured water.	2 identical plants per group, water, camera, pots,

Optional activities you might like to try include:	Resources:
Pupils compare a cut daffodil with one attached to the bulb. Make a simple record of what happens and which survives longer.	Daffodils growing form bulbs, scissors, pots, water, camera
Pupils compare the growth of cress or white mustard plant seedlings when one of the two seed leaves are removed	

Points to Note:

It is a good idea to grow cress or white mustard seedlings in individual

Plants P7-8

Objective 3: To explore plant reproduction and growth

Descriptions of intended outcomes at different levels of attainment

- Makes simple suggestions of what to do to find the answer (P7i)
- Shows an awareness of amounts to use e.g. how much soil to use when growing seeds (P7ii)
- Begins to ask some of their own questions (P8i)
- Locates the right equipment to use for simple investigations (P8ii)

Plants P7-8

Objective 3: To explore plant reproduction and growth

Possible Activities:	Resources:
Grow plants / cress seeds covered with box or black paper container with small hole in one side. Observe the direction the plant grows in.	Selection of plants, cress seeds, soil, boxes, black paper

Optional activities you might like to try include:	Resources:
Find out if the colour of light makes a difference to how plants grow by placing different coloured bags over the plants.	Plants or cress seedlings, coloured plastic bags e.g. black bin bags, green recycling bags, white bin liners,
Test different seeds to see if they contain starch.	

Points to Note:

Pupils may believe that seeds need light to germinate when temperature is the important factor

http://www.polybags.co.uk/shop/coloured-grip-seal-bags_c1259.htm is one site that has coloured plastic bags

Plants P7-8

Objective 4: To recognise what plants need to keep healthy

Descriptions of intended outcomes at different levels of attainment

- Responds to questions requiring an informed decision e.g. how many seeds shall we use? (P7i)
- Uses skills learnt and uses in different context e.g. knowing they need soil and water to grow seeds and not planting too deeply (P7ii)
- Shows an awareness of amounts to use e.g. how much soil to use when growing seeds (P8i)
- Makes simple predictions based on something already encountered e.g. lots of seeds might not grow very well (P8ii)

Plants P7-8

Objective 4: To recognise what plants need to keep healthy

Possible Activities:	Resources:
Find out what happens if plants are overcrowded by growing different numbers of seeds in the same size pot	Pots, compost, cheap bird seed

Optional activities you might like to try include:	Resources:
Make home made weed killer and then try it out on different weeds. Does it work? You need to spray on a dry day or have weed plants in pots in classroom	Home made weedkiller (1/2litre of white vinegar, ¼ cup of salt, table spoon of strong washing up liquid), spray bottle, weeds.
Keep a plant enclosed in a plastic bag for a few weeks and observe what happens. Ask pupil why the plant hasn't died because they would if they had a plastic bag on their heads.	

Plants L1-3

Objective 1: To explore the parts of a plant

Descriptions of intended outcomes at different levels of attainment

- Name some plants and their parts found around the school (L1i)
- Records observations with support e.g. using pre-drawn tables (L1ii)
- Communicates findings of an investigation using everyday language (L1iii)
- Identifies things to observe or measure that help to answer the question being investigated (L2i)
- Responds to prompts to suggest different ways they could have done things (L2ii)
- Compares some of the things they have found out (L2iii)
- Records results in a variety of ways e.g. pictures, tables, bar charts (L3i)
- Makes quantitative measurements (L3ii)
- Explains what they have found out in their experiments linking cause and effect (L3iii)

Plants L1-3

Objective 1: To explore the parts of a plant

Possible Activities:	Resources:
Take pupils on a plant hunt around the school e.g. find: a tree with flowers, grass flower, white flower etc. Name some of the plants pupils find eg daisy, dandelion and some groups of plants eg trees, grass. Pupils draw/paint pictures of plants seen in the school ground or in the classroom showing what they are like. They name/label the flower, stem and leaves. Visit botanic gardens or parks or garden centres to observe and draw less familiar plants. Identify flowers, leaves, stem and roots. Simple 'build a plant' activity. Pupils put sections of basic plant picture in order. Name the flower, stem, leaves and roots as they build the picture. Re-pot a plant that has grown too large for its pot. Show pupils the roots. Pupils think why it needs re-potting.	Drawing equipment Coloured pencil/paint Part of plant labels

Plants L1-3

Objective 1: To explore the parts of a plant

Optional activities you might like to try include:	Resources:
Have a prepared, large, outline plan of the area visited around the school and ask pupils to stick labels or plant pictures where they were found. Make a collage of a plant by reading instructions eg make a plant with 6 petals, one stem, four roots and three leaves Using visual support i.e symbols if necessary. Pupils make and label a model plant using cup cake cases as flowers and leaves and stem from coarse paper , roots from string. wool, rope	Large outline plan of school ground, pens, pencils, pictures of plants found in the school ground or labels with name of plants . Cup cake cases, construction paper, string, wool, rope, scissors,
Pupils could compare bark rubbings taken around the school/ park Use string to measure the circumference of different stems and record in different ways Make a wall collage of the school environment showing places where the plants were found. Use 'drag' and 'drop' programs to put labels against appropriate plant parts Play 'pin the part on the plant' game in the same way as pin the tail on the Donkey. Can be done in teams.	

Plants L1-3

Objective 1: To explore the parts of a plant

Points to Note:

Some children do not think that ‘weeds’ , vegetables or trees are plants.

Some children are allergic to some plants eg hyacinth bulbs.

Some plants are poisonous e.g. ivy, yew.

Forest Stewardship Council (FSC) produce a key to plants commonly found in school fields. https://www.fsc-uk.org/en-uk

Plants L1-3

Objective 2: To begin to link different parts of a plant with their function

Descriptions of intended outcomes at different levels of attainment

- Responds to prompts to say what happened and describes simply what they found out (L1i)
- Begins to use comparative language e.g. more ink moved up this flower (L1ii)
- Uses senses or simple equipment to make observations (L1iii)
- Plans simply how to find the answer to a question with some support (L2i)
- Identifies things to measure or observe that are relevant to the question or idea they are investigating (L2ii)
- Draws on their observations and ideas to offer answers to questions (L2iii)
- Recalls roots act as an anchor for plants and take up water (L3i)
- Records results sequentially and with enough to show any patterns (L3ii)
- Suggests improvements to their working methods (L3iii)

Plants L1-3

Objective 2: To begin to link different parts of a plant with their function

Possible Activities:	Resources:
Observe coloured water travelling upwards through stem to leaves (celery) or flower (carnation) during a lesson. Pupils to draw their observations at different stages during the lesson.	Beaker of coloured water (ink) Freshly cut carnations/celery with leaves

Optional activities you might like to try include:	Resources:
Find out if white carnations can be made to change colour using different coloured liquids	Different coloured inks, water coloured by paint, different coloured fruit squash, Freshly cut white carnations, beakers
Find out if all white flowers will change colour when put in coloured water	

Points to Note:

Pupils often believe roots suck up water.

Some pupils might think that photosynthesis is a substance.

Sometimes pupils think that plants grow at night when they are not watching.

If using stains observe CLEAPSS safety advice.

Plants L1-3

Objective 3: To explore plant reproduction and growth

Descriptions of intended outcomes at different levels of attainment

- Describes plants response to sunlight using everyday language (L1i)
- Recognises the basic features of flowers (L1ii)
- Begins to use comparative language e.g. more, less (L1iii)
- Draws on their observations and ideas to offer answers to questions (L2i)
- Makes comparisons between the basic features of flowers (L2ii)
- Presents their ideas and evidence in appropriate ways (L2iii)
- Uses straightforward scientific evidence to answer questions about plants response to light or pollination (L3i)
- Makes systematic and accurate observations (L3ii)
- Selects equipment or information sources from those provided to address a question or idea under investigation (L3iii)

Plants L1-3

Objective 3: To explore plant reproduction and growth

Possible Activities:	Resources:
Leave established plants in different parts of a room. Observe position of leaves over several days. Move positions and observe again.	Range of plants, access to room with windows

Optional activities you might like to try include:	Resources:
Find out if the colour of the light makes a difference to the direction a plant grows in	Selection of plants, cress seeds, boxes, black paper, coloured acetate to tape over hole in box

Points to Note:

Also see the experiments for P7-8.

Sunflower plants grown from seed can be used to show change in direction as flower turns to face the sun.

Plants L1-3

Objective 4: To recognise what plants need to keep healthy

Descriptions of intended outcomes at different levels of attainment

- Presents evidence in simple templates provided for them (L1i)
- Identifies what has changed during the period of the experiment (L1ii)
- Makes suggestions in response to evaluation questions e.g. Which part worked best? Could we do it a different way? (L1iii)
- Spots when a simple test is unfair (L2i)
- Responds to suggestions to identify some evidence needed to answer a question (L2ii)
- Presents their ideas and evidence in appropriate ways (L2iii)
- Says what they are keeping the same or changing to make a fair test (but need help to carry out in practice) (L3i)
- Uses scientific forms of language when reporting on findings (L3ii)
- Identifies simple advantages of working together on experiments or investigations (L3iii)

Plants L1-3

Objective 4: To recognise what plants need to keep healthy

Possible Activities:	Resources:
For some secondary pupils it might be appropriate to carry out the standard experiments relating to the need for carbon dioxide, light and chlorophyll and then testing leaves for starch.	

Optional activities you might like to try include:	Resources:
For some secondary pupils it might be appropriate to carry out the standard experiments relating to the need for carbon dioxide, light and chlorophyll and then testing leaves for starch.	
For some secondary pupils it might be appropriate to carry out the standard experiments relating to the need for carbon dioxide, light and chlorophyll and then testing leaves for starch.	

Points to Note:

Some pupils believe the plant in the dark will not grow. However it will try and grow towards the light but the plant will be spindly and pale i.e not healthy.

Ref CLEAPSS website for investigations to test for starch.