Medium Term Plan
Environment

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 PSTT recognises that the national curriculum levels used in this document are no longer current.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

Disclaimer
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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: Environment

Big Questions

- Do all food chains start with a green plant?
- What does disease do to a food web?
- Would the world exist without humans?
- Are patterns useful to animals?
- What is a species?
- Is warm blooded better than cold blooded?
- Was I once part of a dinosaur?
- What would happen without decay?
- Do all living things die?
- Do all insects have 6 legs?

Learning Objectives

Pupils will have opportunities:

- To explore similarities and differences between living things , where they live and how to group them.

Answers

- A food chain starts with a producer, an organism that makes food. This is usually a green plant but in the ocean it could be algae or phytoplankton.
- If disease reduces the numbers of one species in the food chain, the numbers of 'producers' for this species may increase and the 'consumers' of this species may decrease.
- If humans became extinct, the world would exist but the numbers of different animal and plant species would change.
- Some prey animals have patterns which may camouflage them and protect them from their predators
- A species is a group of organisms capable of interbreeding.
- There are advantages for both warm blooded and cold blooded animals. A warm blooded animal can regulate its body temperature so it may seek food in all kind of temperatures. A cold blooded animal will not survive in a cold environment but they require less food and have a better immune system than warm-blooded animals.
- Living organisms are made up of carbohydrates and proteins containing carbon and nitrogen. When plants and animals die, the carbon and nitrogen is recycled so it is possible that atoms that were once part of a dinosaur are now part of you.
- Without decay, carbon and nitrogen would not be replaced in the soil and plants would not be ale to grow.
- All living things die and decompose.
- All insects have 6 legs - if it doesn't have 6 legs it's not an insect.

Quick Review activities

- Play the game http://www.bbc.co.uk/schools/scienceclips/ages/5_6/ourselves.shtml to sort things that are alive and not living
- Watch musical video http://www.youtube.com/watch?v=8r3jAZRk1CQ or Sesame Street - Is it alive WMV V9.wmv and pause to ask pupils what makes something alive
- Watch http://www.youtube.com/watch?v=BhIq4SoZFAQ and sing along.

- Collect objects from the local environment and decide if they are/ were alive
- Listen to song about being cold blooded http://www.gamequarium.org/cgi-bin/search/linfo.cgi?id=8925
- Sing the invertebrate song http://www.youtube.com/watch?v=8EWhDdyy_IQ
- Watch video

Vocabulary relevant to this topic

- Environment – conditions in which something lives
- Adaptation –suited to the environment where the plant or animal lives
- Species – a group of living things that can breed together to produce fertile offspring
- Variation – small differences between members of the same species
- Herbivore – animal that eats only plants
- Carnivore – animal that eats only meat
- Omnivore – animal that eats both plants and animals
- Key – questions which lead to name of plant or animal
- Vertebrate – animal with backbone
- Invertebrate – animal without backbone
- Fish – animal group with cold blood and scales
- Reptiles – animal group with dry scaly skin, lay eggs and cold blooded
- Amphibians – animal group that lives on land and in water, smooth moist skin, cold blooded
- Birds – animal group with feathers and warm blood
- Mammals – animal group with fur/hair, live young and warm blooded

- Food, names of common minibeasts e.g. worm, snail, fly, spider, grass, tree, teeth,, claws, fur, feathers, wings, legs, feet, paws, ears,

Background information about this topic

- Living things have to meet 7 characteristics -often referred to as Mrs Gren and this stands for Move, Respire, Sense, Grow, Reproduce, Excrete and Nourish, It isn't always obvious that this applies to all living things e.g. when do plants move or sense? Tickle me plants move very quickly and time lapse photography also shows movement: plants grow towards light and their roots towards water
- It is possible to construct groups to sort living things based on different aspects of life e.g. How they 'feed' (producers, consumers, decomposers) e.g. Where they live (terrestrial, aquatic) e.g. Physical aspects (feathers or fur? Seeds or cones?). In 1735 Carl Linnaeus set out a classification system that is still the basis of that used today. Living things are assigned systematic Latin names e.g. Homo sapiens (man)- the first name has a capital letter and is the genus, and the second name, with a small letter, is the species. This is understood by scientists across the world. However, many plants and animals have simpler common names and these can vary in different parts of the country. For example, Arum maculatum is also known as Lords and ladies, cuckoo pint, toad's meat, dog bobbins and so on. Keys are a useful way of naming unknown plants and animals using a series of questions to which the answer is often yes or no. Some keys will have a choice of feature which then takes them to another clue which may name the living thing or take them t further clues.
- Although animals and plants vary they are also similar in many ways. The most important similarity is that males and females can reproduce and produce fertile offspring. Living things that can do this are called a species. Some species that look very similar may be closely related e.g. monkeys, gibbons, orang-utans. But this is not always true for example whales and hippos are closely related as are donkeys and rhinos. Variation is vital for evolution.
- Variation in a species happens as a result of difference in genes and the environment. An example of variation caused by the environment can be in certain plants like hydrangeas that change colour depending on the acidity of the soil. There are limits to variation though e.g. in the size of living things. The range between the two limits is called a Normal Distribution. There are two sorts of variation – continuous and discontinuous.
- Continuous variation– controlled by genes but can be influenced by the environment. This variation shows a smooth gradation in

characteristics, e.g. height, handspan

- Discontinuous variation – is not affected by the environment and there is no smooth gradation e.g. there are specific groups like blood groups or the living has or doesn't have a characteristic (can roll tongue).
- Nearly all ecosystems are governed by two facts:-
- A supply of energy from the sun is constantly being added to Earth – this energy travels in one direction along a chain
- New supplies of raw materials are not being added to Earth – these have to be recycled round the ecosystem
- Decomposers are vital (e.g. bacteria and fungi) and the waste they produce are the chemicals that plants need to absorb to grow. Decomposers are vital organisms in recycling materials. Food chains and webs show how energy is passed from producers to consumers: most but not all producers are green plants, e.g. it is bacteria in hydrothermal vents. Food chains link together to make food webs. Only about 10% of the energy is passed onto the next organism in the food chain- 90% is used to keep the organism alive and is the reason most food chains are only 3 or 4 organisms long because there is very little energy remaining for the top of the food chain. Food webs give more information about a habitat than a food chain and give a better picture of the complex relationship between organisms.
- Counting the numbers of organisms at each stage in a food chain gives a 'pyramid of numbers'. As energy is lost at each stage the secondary and tertiary consumers have to eat larger amounts of food than the stage below and so numbers decrease. These pyramids can look odd if the producer is large e.g. 1 tree. If mass was measured instead of number then this would form a 'pyramid of biomass' instead.
- Food chains and webs can be badly affected by toxins (such as pesticides), pollution, diseases and non-native species. Killing off one organism can have dire implications for all organisms in the chain or web. DDT is often used as an example which was fatal to birds in large doses but also caused the shells of birds' eggs to thin so that they were crushed during incubation. Sometimes a non native species affects other organisms in the food web, e.g. American minks that escaped from mink farms became another predator of the water vole causing a huge decline in numbers.

Environment P1-3

Objective: To explore similarities and differences between living things , where they live and how to group them

Descriptions of intended outcomes at different levels of attainment

- Encounters a range of sensory evidence during activities (P1i)
- Shows random fleeting response to activity eg. responses to the sensory stimuli by reaching out to engage with an object (P1ii)
- Accepts and engages in coactive or shared exploration (P2i)
- Begins to be proactive in interactions (P2ii)
- Observes the results of their own actions with interest (P3i)
- Actively explores objects and events for more extended periods of time (P3ii)

Possible Activities:	Resources:
Pupils experience being near, looking at and responding to a range of living things in the classroom e.g. earthworms in soil, meal worms, woodlice, African snails, caterpillars, plants in pots. Use a visualiser if appropriate. Use the story "What's Alive?" by Kathleen Weidner Zoehfeld or listen to is at http://www.youtube.com/watch?v=k98DCCjWgg8 and use a range of sensory props Experience the school garden or poly tunnel e.g. planting seeds, growing potatoes, growing salad vegetables.	Worms, snails, woodlice, small mammals (e.g. pet) stick insects, butterflies, chicks, fish tank, range of plants e.g. venus fly trap Visualiser, IWB, speakers, internet access, props e.g. toy cat, flower in pot, toy bird, feathers, stone, doll, bike, water, food, air, egg, access to school garden or grow bags, seed potatoes, other seeds to grow

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Optional activities you might like to try include:	Resources:
Experience living things outside e.g. lie on the grass or touch with hands and feet, feel bark, sit under trees to hear birds or leaves moving, feed ducks in park/ local pond, Invite petting zoo to school for pupils to have hands on experience Experience growing parts of vegetables e.g. potato 'eyes' , onion over water, carrot or parsnip tops in plate of water.	Access to outside – grass, trees, pond or river, local mobile petting zoo, onions, carrots, parsnips, potatoes, saucers, jars
Experience finding plastic animals and plants from a tub filled with non living things e.g. pebbles, wool, sand Experience a walk round the school grounds or locality to collect nonliving things. Experience holding or touching some of the objects	

Environment P1-3

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Points to Note:

Meal worms can be bought form a pet shop and kept in a tub of bran (from health food shop). They do not need water or any other food and will undergo a life cycle in the bran ending up as beetles which just stay in the bran.

Pupils at this stage will not distinguish between live and dead and certainly the more challenging 'never been alive'

http://apps.rhs.org.uk/schoolgardening/uploads/documents/sen_report2009-10_final_1049.pdf has information on school gardens and SEN

Be aware of allergic reactions e.g. to fur asthma

Observe hygiene when handling organisms

Be aware of harm that can be caused by waste from animals

Some plants and animals should not be removed from their natural habitats e.g. newts, bluebells

Environment P4-6

Objective: To explore similarities and differences between living things , where they live and how to group them

Descriptions of intended outcomes at different levels of attainment

- Imitates actions of different living things (P4i)
- Shows interest in objects and activities (P4ii)
- Responds to simple scientific question e.g. can you show me an animal? (P5i)
- Groups and/or matches objects in terms of single obvious feature (P5ii)
- Records using the objects provided (P6i)
- Recognises distinctive features of objects and where they belong (P6ii)

Environment P4-6

Objective: To explore similarities and differences between living things , where they live and how to group them

Possible Activities:	Resources:

Optional activities you might like to try include:	Resources:

Points to Note:

Environment P7-8

Objective: To explore similarities and differences between living things , where they live and how to group them

Descriptions of intended outcomes at different levels of attainment

- Makes more detailed observations (P7i)
- Sorts materials with help and obvious given criterion (P7ii)
- Explores and observes similarities, differences and changes (P8i)
- Begins to ask some of their own questions e.g. What lives here? Where does this live? Why am I here? (P8ii)

Environment P7-8

Objective: To explore similarities and differences between living things , where they live and how to group them

Possible Activities:	Resources:
Pupils and adults bring in photographs of a range of pets or of their favourite animal. Pupils match pets to their species e.g. dog, cat Pupils sort pictures of animals according to a chosen feature e.g. legs/no legs, wings, fur, feathers Invite an outside visitor to show a range of mini beasts eg' The Bug Man' http://www.thebugman.co.uk Talk about how they know if something is alive. With support pupils sort the plants into dead and alive using simple criteria e.g. colour of leaves. Talk about some plant parts that may look dead e.g. branch with buds, seeds, apple, onion and set up tests to watch them grow Watch clips on characteristics of vertebrates http://www.youtube.com/watch?v=aj0Vs-LUjfg&list=PL6E3648A9F7DA2ECE&index=10 And make a class poster about each group – pupils can stick on different examples of each in the right place and add labels/ symbols of characteristics	Selection photographs or different animals or pupils' own pets, symbols and signs for different features, IWB, speakers, internet access, paper for posters, photos of vertebrate animals, labels/ symbols of characteristics

Environment P7-8

Objective: To explore similarities and differences between living things , where they live and how to group them

Optional activities you might like to try include:	Resources:
Visit a local farm or children's zoo, taking photos of the different animals. Try to sort them into groups once back in the classroom. Give pupils some objects to decide if they are living or have never been alive (avoid things that might have been alive once or come from living things e.g. wool) Using a web cam or visualiser pupils observe daphnia moving in water, before feeding to goldfish (e.g. of carnivore.) Link to snack time! Observe stick insects eating privet (e.g. of herbivore) Pupils make animal masks and select the matching tabards of different animals coverings e.g. masks: rhino, lion, parrot, lizard, goldfish. Tabard: fur, scale, feather, leather Play 'What am I?' using features of familiar pets. E.g. I have fur, I live in a desert, I have a hump… Revisit the characteristics of different vertebrate groups e.g. Let pupils touch some tapioca that's been sprinkled in a small bowl filled with boiling water and touch a few grapes laid on sand or dirt in a bowl. What are the differences between them? Which do they think are like reptile eggs? Amphibian eggs? Compare to a bird's egg e.g. Let pupils touch a piece of clay with rows of shelled sunflower seeds stuck in it and a piece of plastic wrap sprayed with thin layer of non-stick cooking spray. How does each feel? Which do you they think is like reptile skin? amphibian skin?	Selection photographs or different animals or pupils' own pets, symbols and signs for different features, IWB, speakers, internet access, paper for posters, photos of vertebrate animals, labels/ symbols of characteristics RV1: Local farm or zoo, web cam, visualiser, deep trays, daphnia, goldfish, stick insects, cage, privet leaves or other examples of carnivores and herbivores, objects to sort into living/never been alive e.g. stones, plastic plant and animal, dead plant and animal, toy animal, plastic box, nail, candle Create and craft masks, scales, feathers, faux fur /leather, sugar paper/plastic bags to make tabard, bibs, tapioca, grapes, bowls, boiling water, sand, hen's eggs, clay, sunflower seeds, cling film, non stick cooking spray RV2 Leaf litter, magnifiers, trays, materials to support identification, plastic plant and animal, dead plant and animal, toy animal,IWB, speakers, internet access, photos of vertebrates

Environment P7-8

Objective: To explore similarities and differences between living things , where they live and how to group them

Pupils collect and sort leaf litter or other habitat such as under stones, window ledges, shaking branches of a tree, pond water. Try to name some of the minibeasts found. Use simple pictures of the main possibilities http://www.ypte.org.uk/animal/minibeasts/30#minibeasts_in_leaf_litter Compare a dead and live plant: dead and live insect: live rabbit to toy one or plastic plant to live one Watch clip http://www.watchknowlearn.org/Video.aspx?VideoID=17136&CategoryID=6154 and identify the main features of each vertebrate group. Give pupils some vertebrate photos to allocate to different groups with support or use powerpoint	

Points to Note:

Some pupils may think a toy car, fire, cloud or a candle is living because they move and movement is often the main characteristic they look for. Pupils generally identify animals as living but not so a lot of plants especially trees .

Tree branches with buds should begin to grow when inside a vase of water .

Growing green onions in water is easy to do - https://www.gardeningknowhow.com/edible/vegetables/onion/growing-green-onions-in-water.htm

Ensure pupils handle living things with care and sensitivity

Environment L1-3

Objective: To explore similarities and differences between living things , where they live and how to group them

Descriptions of intended outcomes at different levels of attainment

- Draws on everyday experience to help answer questions (L1i)
- Presents evidence in simple templates provided for them (L1ii)
- Recognises the basic features of living things (1iii)
- Makes comparisons between the basic features or components of living things (L2i)
- Sorts and groups living things on the basis of what they have observed (L2ii)
- Presents their ideas and evidence in appropriate ways (L2iii)
- Uses scientific forms of language when reporting on findings (L3i)
- Makes accurate observations (L3ii)
- Presents their findings in more than one way (L3iii)

Environment L1-3

Objective: To explore similarities and differences between living things , where they live and how to group them

Possible Activities:	Resources:

Optional activities you might like to try include:	Resources:

Points to Note: