



Medium Term Plan

Life cycles



The content of these plans is ©PSTT 2019 but may be freely reproduced by teachers in schools for educational purposes.

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 PSTT recognises that the national curriculum levels used in this document are no longer current.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

PSTT is not liable for the actions or activities of any reader or anyone else who uses the information in this document or the associated classroom materials. PSTT assumes no liability with regard to injuries or damage to property that may occur as a result of using the information contained in these plans.

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.

Big Questions

- Do all living things grow?
- Do all living things reproduce?
- Are life cycles affected by size?
- Are seeds dead?
- Are males always bigger?

Learning Objectives

Pupils will have opportunities:

- To explore different life cycles and growth
- To explore aspects of human reproduction

Quick review activities

- Do all living things grow?
- Do all living things reproduce?
- Are life cycles affected by size?
- Are seeds dead?
- Are males always bigger?

Answers

- All living things grow. Growth is the increase in size and mass of that organism. It should not be confused with development which involves the transformation of the organism as it goes through the growth process.
- Sexual reproduction requires the two cells from different individuals unite to produce the first cell of a new organism. In asexual reproduction a single organism can reproduce without the aid of another.
- Life-cycles vary in time depending on the species of animal, and can be as short as just a few weeks for insects, to up to 200 years for sea urchins. Larger animals often have longer life cycles but not always.
- Seeds contain a living embryo and so they are alive. Some seeds can live for a long time before germination. A dormant seed is one that is unable to germinate in a specified period of time under a combination of environmental factors that are normally suitable for the germination of the non-dormant seed.
- In mammals and birds, it is common for males to be larger than their females. However, females are the larger sex in most reptiles other than lizards and crocodilians; in most amphibians and fishes; in the vast majority insects, spiders and other arthropods.

Vocabulary relevant to this topic

- Life cycle – the stages an organism goes through during its lifetime to reproduce itself
- Penis – carries sperm from testicles
- Vagina – tube that connects womb to outside world
- Breasts
- Womb/ uterus – where the baby develops
- Oviduct/ egg tube – carries egg to womb
- Scrotum – bag of skin that holds testicles
- Testicles – make the sperm
- Metamorphosis – change of shape/form
- Baby; child; adult; grow; change; teenager; toddler; middle-aged; pregnant
- Alternative everyday names for human reproductive bits e.g. willy;

Background information about this topic

- A life cycle is the series of events that take place from the time an organism reproduces to the time its offspring reproduce. It is more like a spiral than a cycle because there can be an overlap of generations. Life cycles can vary in length depending on the species. Insects can be a few weeks but sea urchins can be up to 200 years. Some animals have a free-living young stage in the life cycle which is a larva e.g. tadpoles, caterpillars. The siren salamander remains in larval form all its life and it is thought they reproduce externally.
- All animal life cycles begin with growth and development followed by reproduction: Reproduction marks the end of the life cycle

and many animals die after they have reproduced. Insects have interesting life cycles some go through a complete change or metamorphosis so that the young look completely different to the parents e.g. butterflies, ants, bees, beetles, flies. About 12% go through a gradual change or incomplete metamorphosis where the young looks like the adult and gradually gets bigger by moulting e.g. cockroaches, locusts, bugs. Only insects and amphibians go through metamorphosis – amphibians being the only vertebrates to do so.

- Some bizarre life cycles include:
 - the cuckoo – lays eggs in other birds nest and the young cuckoo may eject other young to ensure its own survival
 - the octopus –mother octopus doesn't eat while taking care of the eggs (2-10 months) and usually dies shortly after they hatch
 - the kangaroo –young kangaroos weigh about 2 g when born and they climb up into the pouch where it attaches to a milk teat for about 9 months.
-
- Plant life cycles are best restricted to flowering plants with pollen carried either by insects or wind. Some plants with interesting life cycles include:
 - Saguaro cactuses –life span of 150-175 years: produce 40 million seeds but only 1 will outlive parent. Uses animals to disperse seeds
 - Pitcher plants – carnivorous plants that feed on insects with seeds dispersed by the wind
 - Squirted cucumbers –when ripe the slightest touch or vibration causes them to squirt seeds
 - Mexican jumping beans – seed pods of a Mexican spurge plant that a blue moth lays its eggs in. When the larva hatches it eats the inside of the seed pod and then makes the pod jump as it moves. It is thought this helps it survive.
 - Baobab trees – sometimes called upside down trees. Reputed to have life span of 3000 years! Flowers last just 24 hours and are pollinated by bats (it is thought)
 - Rafflesias –largest flower in the world and smells of rotten meat to attract flies. It is a parasite plant with no leaves, stems or roots and the flower only lasts 5 days.

- Growth – as plants and animals develop they get larger and heavier so that mass and volume increase. This happens because external substances are taken in and become part of the plant or animal in new cells. The plant or animal may also become more complex as it grows and develops. Plants usually grow throughout their lives but animals usually stop at a particular age e.g. 18 years for humans. Not all parts of an organism grow at the same rate e.g. human head size doesn't change much from birth. Even when growth has stopped there is still replacement! It has been estimated that all the chemicals in the human body are replaced by new ones every 7 years.
- Making new cells is fundamental to growth and this happens when a single cell divides: it makes a copy of the genetic information so that there is a complete set for each cell. For most single celled organisms splitting into two is their complete life cycle. All animals begin as a single cell that divides many times to make a multi-cellular organism with different types of cells doing different jobs: this is tissue. Most animals make specialised reproductive cells containing half the genetic information which becomes a complete set at fertilisation. Many plants too have specialised reproductive cells made in the anthers and ovary. Again these contain half the genetic information which becomes a complete set after pollination/ fertilisation in each seed. A number of plants can reproduce without reproductive cells because they have tissues that contain cells that can develop into any of the cells that make up the plant e.g strawberries, willow trees, Mexican hat plants. Gardeners use this property when they take cuttings or artificially propagate.
- Pupils may perceive gender as determined by external things like clothes, hairstyles, names and behaviour. They could think that a mother eats 'things' to make a baby in the stomach or that an egg looks like a bird egg.

Life cycles P1-3

Objective 1: To explore different life cycles and growth

Descriptions of intended outcomes at different levels of attainment

- Is present during the experience but shows no or just reflex response (P1i)
- Shows a random fleeting response to the experience (P1ii)
- Shows a more consistent response to the experience (P2i)
- Shows more consistent and differentiated response to the same experience (P2ii)
- Begins to communicate intentionally e.g. shows likes or dislikes of animals (P3i)
- Actively explores using all sense with support (P3ii)

Life cycles P1-3

Objective 1: To explore different life cycles and growth

Possible Activities:	Resources:
Experience touching different pets to raise awareness that animals exist	Visitors who can bring in different pets
Optional activities you might like to try include:	Resources:
Experience touching different farm animals to raise awareness that animals exist	Visitors who can bring in farm animals
Experience touching African land snails and giant millipedes	

Points to Note:

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

Be aware of allergies

Be aware of hygiene issues after touching animals. Refer to CLEAPSS guidance

Life cycles P1-3

Objective 2: To explore aspects of human reproduction

Descriptions of intended outcomes at different levels of attainment

- Encounters some objects linked to birthdays (P1i)
- Shows a random fleeting response to birthday activities (P1ii)
- Shows interest in aspects of birthday items (P2i)
- Shows consistent or differentiated response to birthday items (P2ii)
- Participates in shared activities exploring birthday items (P3i)
- Actively explores aspects of birthday items for more extended periods (P3ii)

Life cycles P1-3

Objective 2: To explore aspects of human reproduction

Possible Activities:	Resources:
Experience activities linked to birthdays such as opening presents and candles on cakes	
Optional activities you might like to try include:	Resources:
Experience a birthday party	
Experience touching / hearing different birthday cards and wrapping paper	

Points to Note:

Beware that some pupils at this stage may still be using baby toys.

Life cycles P4-6

Objective 1: To explore different life cycles and growth

Descriptions of intended outcomes at different levels of attainment

- Shows interest in living things (P4i)
- Communicates an awareness of changes in the animals (P4ii)
- Indicates before and after of animal changes (P5i)
- Responds to simple questions (P5ii)
- Recognises distinctive features of some of the animals (P6i)
- Records by matching (P6ii)

Life cycles P4-6

Objective 1: To explore different life cycles and growth

<p>Possible Activities:</p>	<p>Resources:</p>
<p>Experience hatching eggs in schools. Sometimes the baby chicks may be kept to develop into hens.</p>	<p>Fertile eggs, incubator and lamps</p>
<p>Optional activities you might like to try include:</p>	<p>Resources:</p>
<p>Observe the life cycle of a butterfly. Younger pupils might like the Very Hungry Caterpillar Book.</p> <p>Help children to see that even though the young are different to parents they are the same species.</p>	<p>Butterfly kits; soft toy of chrysalis that becomes butterfly (e.g. from TTS)</p>
<p>Observe frog spawn development over a few weeks. This could be linked to PE and exploring the movements of different stages.</p> <p>Help children to see that even though the young are different to parents they are the same species.</p>	

Points to Note:

Pupils might not make links between young and adult version of the same animal Help pupils to see that even though the young are different to parents they are the same species

Check CLEAPSS guidance on keeping frog spawn in school.

TTS can provide eggs and incubators

Life cycles P4-6

Objective 1: To explore different life cycles and growth

Possible Activities:	Resources:
<p>Explore the concepts of bigger and smaller by comparing chickens and hens</p> <p>Match familiar baby and adult animals where babies resemble parents</p>	
Optional activities you might like to try include:	Resources:
<p>Explore the concepts of bigger and smaller by comparing butterflies with caterpillars</p> <p>Identify mis- matched parents and babies</p>	
<p>Explore the concepts of bigger and smaller by comparing frogspawn and adult frogs</p> <p>Match less familiar baby and adult animals where babies resemble parents</p>	

Points to Note:

For all animals except humans keep growth to a simple size comparison

Pupils are unlikely to make links between food and growth

Life cycles P4-6

Objective 1: To explore different life cycles and growth

<p>Possible Activities:</p>	<p>Resources:</p>
<p>Talk about why animals need food and link to growth.</p> <p>Investigate what foods mealworms prefer. By placing them in container with 4 different foods in each corners</p>	<p>Meal worms; containers; 4 foods e.g. Weetabix, soil, cabbage, dog food/ biscuits</p>
<p>Optional activities you might like to try include:</p>	<p>Resources:</p>
<p>Talk about what might happen if animals don't have enough to eat. Compare pictures of starving animals with healthy ones.</p> <p>Measure out the correct amounts of dried dog food for different sized dogs. Can they see a pattern? It might help to use bags of sugar or similar on a carrier bag to represent the weight of different dogs so pupils can lift it and compare to the amount of food. Make display of this.</p>	<p>Animals pictures; dried dog food; scales or measuring beakers; plastic bags and bags of sugar; large chair scales to sit bags on</p>
<p>Investigate how stick insects grow by collecting and displaying shed skins</p>	

Points to Note:

Be aware of pupils who might be upset by pictures of starving animals

Life cycles P4-6

Objective 1: To explore different life cycles and growth

<p>Possible Activities:</p>	<p>Resources:</p>
<p>Introduce pupils to looking at objects with magnifying glasses so that they can begin to appreciate that things can be made of or contain smaller part.</p>	<p>Magnifying glasses, objects to look at e.g. dry and wet moss, cotton wool, hair, skin</p>
<p>Optional activities you might like to try include:</p>	<p>Resources:</p>
<p>Look at objects with bioviewers and compare then to looking at objects with a magnifying glass.</p>	<p>Magnifying glasses; bioviewers; objects to look at e.g. pond water; plant parts</p>
<p>Look at different crystals with a magnifying glass and then put a drop of saturated solutions onto a slide and observe what happens as the water evaporates. This is a good experiment to use the time lapse function on a digital microscope.</p>	

Points to Note:

Pupils can generally relate magnifications of 10X to real life and plenty of experience of this before moving onto microscopes

Some crystals might be toxic and pupils will need to wash their hands

Life cycles P4-6

Objective 1: To explore different life cycles and growth

<p>Possible Activities:</p>	<p>Resources:</p>
<p>Compare what baby and adult animals can and cannot do. E.g. baby kittens are born blind, only drink milk, can't hunt for food</p>	<p>Clips of baby animals: Life of Penguins: puffins</p>
<p>Optional activities you might like to try include:</p>	<p>Resources:</p>
<p>Compare the number of offspring born with the amount of parental care and pressure from predators book if appropriate</p>	<p>Access to internet or books</p>
<p>Find out about some strange or bizarre life cycles e.g. octopus, cuckoo, seahorse</p>	

Points to Note:

For younger pupils you might like to use the book Owl Babies

Life cycles P4-6

Objective 1: To explore different life cycles and growth

<p>Possible Activities:</p>	<p>Resources:</p>
<p>Introduce pupils to looking at objects with hand lenses and then comparing with low magnification on a microscope so that they can begin to appreciate that things can be made of or contain smaller part. Ask them to draw what they can see.</p> <p>Look at newspaper print to see what happens to the image when viewed under a microscope.</p>	<p>Microscopes or digital microscope: slides and cover slips; everyday objects to look at e.g. hair, leaf, wood, paper,</p>
<p>Optional activities you might like to try include:</p>	<p>Resources:</p>
<p>Talk to pupils about what body is made of. Focus on external features e.g. eyes, ears, skin etc and explain that these are some organs that help to make body. Then use hand lenses to look more closely at skin. What can they see? Does it look as though it is made of lots of smaller bits? Teacher could dissect and eye for pupils to see different parts</p>	<p>Hand lenses; digital microscope, eyeballs from butcher, dissecting kit, tray</p>
<p>Look at some prepared slides under the microscope and draw what they can see.</p> <p>Introduce the word cell and make 3D models</p>	

Life cycles P4-6

Objective 1: To explore different life cycles and growth

Points to Note:

It might be easier to use a digital microscope as some pupils will find fine motor control difficult.

For some pupils it might be useful to show them some of Robert Hooke's early drawings of cells

If dissecting an eye pupils need to have the option to opt out or can use

<https://www.bbc.com/bitesize/clips/zf9c87h>

Life cycles P4-6

Objective 2: To explore aspects of human reproduction

Descriptions of intended outcomes at different levels of attainment

- Shows interest in the photos (P4i)
- Explores using vocalisation (P4ii)
- Anticipates the activities and takes turns (P5i)
- Responds to simple scientific questions (P5ii)
- Recognises distinctive features of stages of human life cycle (P6i)
- Sorts photographs or clothes using one criterion (P6ii)

Life cycles P4-6

Objective 2: To explore aspects of human reproduction

<p>Possible Activities:</p>	<p>Resources:</p>
<p>Look at differences between boys and girls to be sure pupils have identified what sex they are.</p> <p>Compare the differences between the two sexes.</p>	<p>Photos or pictures of a variety of boys and girls</p>
<p>Optional activities you might like to try include:</p>	<p>Resources:</p>
<p>Look at differences between boys and girls as they develop i.e. at puberty</p>	<p>Photos of boys and girls at different stages of development</p>
<p>Look at differences between old and young people possibly by visiting an old people's home and nursery</p>	

Points to Note:

Looking at differences between boys and girls might be too difficult for primary aged pupils at this level who haven't yet got a concept of themselves

Symbols are available for male and female body parts

Ensure all pupils are aware of changes in the opposite sex as well

Life cycles P4-6

Objective 2: To explore aspects of human reproduction

<p>Possible Activities:</p>	<p>Resources:</p>
<p>Look at photos of themselves or adults in class at different life stages</p>	<p>Photos of pupils or adults at different stages</p>
<p>Optional activities you might like to try include:</p>	<p>Resources:</p>
<p>Sort clothes into ones for babies and one for pupils own age or adults</p>	<p>Selection of different clothing</p>
<p>Select objects from a group that different ages of humans might use</p>	

Life cycles P4-6

Objective 2: To explore aspects of human reproduction

<p>Possible Activities:</p>	<p>Resources:</p>
<p>Shows some clips/photos of pregnant mums and talk about what is happening. If appropriate begin to look at male and female reproductive parts.</p>	<p>Models, photos of reproductive organs; videos;</p>
<p>Optional activities you might like to try include:</p>	<p>Resources:</p>
<p>Show pupils pictures/ video of the baby developing inside the womb. Identify how the baby changes</p>	<p>Models of baby's growing in the womb; use video clips</p>
<p>Talk about birth using photos and video as appropriate. Show how a newborn baby responds e.g. reflex actions; turning cheek when touched</p>	

Life cycles P4-6

Objective 2: To explore aspects of human reproduction

Possible Activities:	Resources:
Talk about things that babies need and why– maybe have a mum and baby visit.	Baby catalogues; some baby equipment e.g. bottle, high chair; nappies etc
Optional activities you might like to try include:	Resources:
Identify things that babies can't do that they can	Pictures or clips of babies
Compare baby foods for taste and texture.	

Points to Note:

Be sensitive to any pupils who may still be using nappies

Life cycles P4-6

Objective 2: To explore aspects of human reproduction

<p>Possible Activities:</p>	<p>Resources:</p>
<p>Investigate what makes the best baby food. Discuss what baby food needs to be like and why. Does the length of time cooked for make a difference? Are some foods better than others? Test by seeing which goes through the sieve. Pupils could carry out a taste survey in the school</p> <p>Draw a bar chart of life expectancy for humans over the ages e.g. world averages Stone Age =20: Iron Age =26: Ancient Roman or Greek =28: 1200s=30: 1600s =35: early 1900 =31: early 2000's =67. Talk about why they think there could be a difference.</p>	<p>Access to food tech room; timers; pans; different foods to try; sieves; Secondary resources about human life expectancies, unicubes or post it notes to create kinaesthetic bar charts</p>
<p>Optional activities you might like to try include:</p>	<p>Resources:</p>
<p>Investigate the absorbency of nappies</p> <p>Talk about getting old and things that happen. Try to mimic 'old age' by seeing what it feels like by using some of the artefacts in the resources list to do different tasks e.g. looking through glasses with scratched lenses to write or read a book.</p>	<p>Different nappies; water; measuring cylinder or syringes: Glasses with scratched lenses/ covered with sellotape(cataracts), thick gloves (loss of dexterity), ear plugs/ cotton wool, crepe bandages to wrap round knees and elbows to restrict movement,</p>

Life cycles P4-6

Objective 2: To explore aspects of human reproduction

Invite a mother in with a baby to show feeding, nappy changing, bathing etc–pupils could prepare questions in advance and record some of the answers to listen to again and talk about in lessons

Talk about what they think it might feel like to be old and what things might old people need to help them. Have some artefacts ready.

Points to Note:

When talking about old age try not to give an overly negative impression and make it clear that not everyone experiences the same changes.

Also when looking at things that old people might need e.g. thick glasses, hearing aids, walking sticks, false teeth, medicines etc that some pupils be in the same position.

Be aware that some pupils may be wearing incontinence pads and may be sensitive to this

It is advisable for students to prepare questions in advance when inviting a guest in – so there are fewer unpleasant surprises.

Some pupils may have the same aids that older people need so handle with sensitivity.

Life cycles P7-8

Objective 1: To explore different life cycles and growth

Descriptions of intended outcomes at different levels of attainment

- Communicates simple observations (P7i)
- Makes simple records of findings (P7ii)
- Observes changes and describes them when asked (P8i)
- Makes suggestions for planning and saying what they found out (P8ii)

Life cycles P7-8

Objective 1: To explore different life cycles and growth

<p>Possible Activities:</p>	<p>Resources:</p>
<p>Sequence life cycles of animals where young resemble the parents</p> <p>Record simply the length of different stages of chick life cycle.</p>	<p>Cut up life cycles; simple recording sheet using a calendar or symbol sheet with days of the week</p>
<p>Optional activities you might like to try include:</p>	<p>Resources:</p>
<p>Draw life cycle in the wrong order for pupils to identify the errors</p> <p>Record simply the length of different stages of butterfly life cycle. Compare to chick life cycle length</p>	<p>Life cycles drawn in wrong order. Simple recording sheet using a calendar or symbol sheet with days of the week</p>
<p>Sequence life cycles of animals where young don't resemble the parents. Link to butterflies or frogspawn kept in classroom</p> <p>Record simply the length of different stages of frog life cycle compare to chick and butterfly life cycles</p>	

Life cycles P7-8

Objective 2: To explore aspects of human reproduction

Descriptions of intended outcomes at different levels of attainment

- Names some of the stages of the human life cycle (P7i)
- Sequences the human life cycle (P7ii)
- Describes some of the ways a baby changes in the womb (P8i)
- Sorts objects/ activities using simple criteria (P8ii)

Life cycles P7-8

Objective 2: To explore aspects of human reproduction

<p>Possible Activities:</p>	<p>Resources:</p>
<p>Show pupils the main stages in the human life cycle i.e. baby, toddler, teenager, adult</p> <p>Make a collage of humans at different ages</p> <p>Role play taking on different ages</p>	<p>Human life cycle stages; catalogues are a useful source of human pictures at different ages</p>
<p>Optional activities you might like to try include:</p>	<p>Resources:</p>
<p>Make a collection of objects associated with different ages</p>	<p>Baby toys, nappies, false teeth, walking stick etc</p>
<p>Use human life cycle models for pupils to sequence and begin to look at some differences between them</p> <p>Create a timeline to demonstrate the times for each stage in the human life cycle</p>	

Points to Note:

Some pupils may need to be made aware that hair and nails grow.

Life cycles L1-3

Objective 1: To explore different life cycles and growth

Descriptions of intended outcomes at different levels of attainment

- Describes what they found out using everyday language e.g. how adult and baby animals differ (L1i)
- Records information simply (L1ii)
- Begins to identify simple patterns in what they found out (L2i)
- Compares some of the things they have found out (L2ii)
- Records what they have found out in variety of ways (L3i)
- Explains some of the things they have found out (simple linking of cause and effect) (L3ii)

Life cycles L1-3

Objective 1: To explore different life cycles and growth

<p>Possible Activities:</p>	<p>Resources:</p>
<p>Investigate lengths of different life cycles and see if there are any patterns between them e.g. do bigger animals have longer life cycles?</p> <p>Draw a timeline to show how humans change from birth to old age</p>	<p>Access to internet or books on life cycles</p>
<p>Optional activities you might like to try include:</p>	<p>Resources:</p>
<p>Investigate the life cycle of brine shrimps or tadpoles</p>	<p>Large pop bottles; brine shrimps or tadpoles; tanks for tadpoles</p>
<p>Investigate the life cycle of meal worms</p>	

Life cycles L1-3

Objective 2: To explore aspects of human reproduction

Descriptions of intended outcomes at different levels of attainment

- Describes simply the process of puberty (L1i)
- Names simple male and female reproductive parts (L1ii)
- Records results in pre-drawn tables (L1iii)
- Describes simply what they found out (L1iv)
- Recognises the functions of sperm and eggs in the beginning of a new life (L2i)
- Sequences the development of a baby in the womb (L2ii)
- Shows an awareness of aspects of antenatal care (L2iii)
- Plans simply how to find the answer to a question with some support (L2iv)
- Records results in an ordered way (L2v)
- Ranks results in order (L2vi)
- Explains simply how humans reproduce (L3i)
- Names main stages of birth
- Describes the development of a baby in the womb (L3ii)
- Describes aspects of caring for a baby (L3iii)
- Constructs tables to record their results (L3iv)
- Explains what their results show (simple linking of cause and effect) (L3v)

Life cycles L1-3

Objective 2: To explore aspects of human reproduction

Possible Activities:	Resources:
Optional activities you might like to try include:	Resources:

Points to Note:

The whole process of reproduction needs to be age appropriate and will be revisited over the years with a different focus and more complexity as pupils mature

Be aware that some pupils may be wearing incontinence pads and it may cause confusion with nappies and sanitary towels