Year 2 - Animals including humans

Reference to the Programme of Study 2014

Pupils should be taught to:

- Notice that animals, including humans, have offspring which grow into adults
- Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
- Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

The learning journey: Animals including humans

Year group	Statutory Requirements from the Programme of study
1	• Identify and name a variety of common animals that are birds, fish, amphibians, reptiles and mammals • Identify and name a variety of common animals that are carnivores, herbivores and omnivores. • Describe and compare the structure of a variety of common animals (birds, fish, amphibians, reptiles and mammals, and including pets). • Identify, name draw and label the basic parts of the human body and say which parts of the body is associated with each sense.
2	• Notice that animals, including humans, have offspring which grow into adults • Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.
3	• Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • Identify that humans and some animals have skeletons and muscles for support, protection and movement.
4	• Describe the simple functions of the basic parts of the digestive system in humans • Identify the different types of teeth in humans and their simple functions • Construct and interpret a variety of food chains, identifying producers, predators and prey.

5	• Describe the changes as humans develop from birth to old age.
6	• Identify and name the main parts of the human circulatory system, and explain the functions of the heart, blood vessels and blood • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • Describe the ways in which nutrients and water are transported within animals, including humans.

How the children should learn science at Key Stage 1

The principal focus of science teaching in Key Stage 1 is to enable pupils to **experience and observe phenomena**, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to **be curious and ask questions** about what they notice.

Suggestions for Working Scientifically

Pupils might work scientifically by: observing, through video or first-hand observation and measurement, how different animals, including humans, grow; asking questions about what things animals need for survival and what humans need to stay healthy; and suggesting ways to find answers to their questions

Further guidance

These opportunities for working scientifically should be provided across Years 1 and 2 so that the expectations in the programme of study can be met by the end of Year 2. Pupils are **not** expected to cover each aspect for every area of study.

Asking questions. Children should ask simple questions and recognise that they can be answered in different ways.
Scientific enquiries. They should be able to do the following types of enquiry:
Observations**.** They should observe closely, using simple equipment.
Simple tests
Identifying and classifying
Secondary sources. They should use simple secondary sources to find answers.
Recording. They should gather and record data to suggest answers to their questions. With help, they should record in a range of ways and begin to use simple scientific language.
Analysing observations. They should use their observations and ideas to suggest answers to questions. They should notice patterns and relationships in their observations. They should talk about what they have found out and how they found out.
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Preparation for this unit of study

A baby visit

Find out whether there is a mother within the school who is willing to bring a baby into class so that the children can relate this to human growth.

Preparing the children and adults for all weathers

Often the biology units of study within primary schools are only learnt during pleasant spring or summer days. However, the new curriculum states that: 'Pupils should use the local environment throughout the year to explore and answer questions about animals in their habitat'. Therefore, we need to ensure that children and adults have the correct clothing and attitude to learn outside in all of the terms. This is essential if children are really going to understand the changes that occur over time. Thus, schools might consider purchasing different sizes of waterproof jackets and possibly even welly boots. Children and some adults will also need to learn that as scientists the children will need to learn in all types of weather.

Plan when in the year is best to do the different aspects of learning

Aspects of this unit of study could be covered at different times in the year. Before the year begins, the teacher must plan ahead, deciding when each of the aspects of learning will be covered. So, for instance, if looking for minibeasts, the children are going to have the most successes if they look between April and the end of summer. However, be aware of when things happen in your wildlife area. So, for instance, you might find frogs going back to water in med-February, or butterflies feeding on plants in late July. Many birds are great to watch in mid-January when there are not so many leaves on the trees.

Preparing the indoors for learning

1. Display. Ensure that your display board on animals and other animals is interactive. There could be questions that the children have created, key science words, and pieces of information.
2. A short-term terrarium. A terrarium is a container in which some types of invertebrates can be kept for a short period of time. It could be a transparent tank covered with secured plastic sheet. Inside you will need to place damp garden soil, covered with decaying leaves. This should be kept in a cool and dimly lit place. Animals should only be kept for a day or two. Do NOT keep worms in them, and don't place in too many animals or there could be too many droppings. You can feed the animals on sliced vegetables and fruit.
3. Purchase particular minibeasts that can be studied over time: e.g. ladybirds and butterflies.

Recording findings throughout the year

It may be worth keeping a **large floor book** (like a giant scrap book) in which 'evidence' of the animal world developing in the school can be placed – e.g. photos of habitats in different seasons and the animals found there.. Some of this 'evidence' could be **collected at different points throughout the year**, but used in the studies during this unit of work.

Preparing the learning spaces

Make sure that you have **a great range of habitats in the school grounds.** This will mean having: long grass areas, wild flower area, garden flower area, trees, plants in and around a pond, vegetable allotment, hibernation areas, ponds, etc. You will need to mark where particular spaces are for particular activities. This could be done by laminating letters or number with a background of a particular colour that links to a particular activity. This will help not only for the children to focus in on the animals that are relevant to their activity, but can help the children to make links over time.
Use information from CLEAPSS (Developing and Using Environmental Areas in School Grounds L221), as well as organisations such the Bee Conservation Trust, the Butterfly Conservation Trust and the RSPB to ensure that plants you grow and the habitats that you develop are useful for the range of animals that could live in your school grounds.

Also, look out for any **national surveys** that may be taking place which are looking different plants in local environments.

Resources

- Pictures of various animals at many of their stages of development.
- A variety of resources for keeping the minibeast/s being studied healthy.
- Sketches of life cycles of a range of animals - http://www.kidzone.ws/animals/lifecycle.htm
- Ladybirds (adults) available from various suppliers (e.g. http://www.greengardener.co.uk/product.asp?id_pc=34&cat=75)
- Caterpillars available from various suppliers – e.g. http://www.wwb.co.uk/ and http://www.insectlore-europe.com/
- Variety of materials for making containers in which to keep the minibeasts.
- Minibeast eggs (found outside)
- Incubator
- Chicken eggs
- Children's clothes (different ages)
- Photos of the children and their families
- Home-made measuring charts
- Card strips on which are written the needs of animals
- Home-made 'Needs spinner'

- Lunchboxes containing different types and amounts of food.
- Large floor book (can be made from A2 sheets of card/sugar paper folded and stapled).
- Video camera
- Digital camera
- Animal identification charts from Gatekeeper (www.gatekeeperel.co.uk)

Key vocabulary

Scientific Language
They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways.
Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1

- Classification - Birds, fish, amphibians, reptiles, mammals and invertebrates
- Classification - Carnivores, herbivores, omnivores
- Stages of growth of many insects – egg, larva, pupa, adult
- Names of some invertebrates – ladybirds, butterflies, dragonflies, etc
- Names of some amphibians – smooth newt, common frog, toad
- Stages of life –baby, toddler, child, teenager, adult
- Life processes – growth, nutrition (feeding), respiration (breathing is part of this)
- Hygiene – clean, wash, germs
- Foods – healthy, grow, strong, energy

Key information for teachers

Life cycles of minibeasts

There are a range of life-cycles of minbeasts:

1. Worms, snails, woodlice, spiders and centipedes: egg ---'miniature' adult ---adult.
2. Most insects: egg ---larva --- pupa ---adult.
3. Some insects, e.g. dragonflies and grasshoppers have a comparatively simple cycle: egg --- nymph --- adult.

Life processes of living things

The seven characteristics of living things are:

1. Movement – most animals can move freely from place to place
2. Respiration – is the process by which animals release the energy from their food; using oxygen from the air dissolved in water. Respiration takes place in all living cells.
3. Sensitivity – is the ability to respond to stimuli and change behaviour as a result of this.
4. Nutrition (feeding) – animals obtain their energy by feeding on plants or other animals.
5. Excretion – animals get rid of waste materials produced as a result of processes taking place in their cells.
6. Reproduction – if an animal lives until it can reproduce, it may than pass on its genetic material to a new generation of offspring.
7. Growth – is the increase in complexity and size of an animal. Animals will grow up to a particular age and then the growth of new cells is then diverted towards replacing old cells.

Key scientists

David Attenborough (1926 -) http://www.davidattenborough.co.uk/biography/

Learning Expectations	Possible Tasks	Resources
To know that animals have offspring that grow into adults. To be able to use observations to suggest answers to questions. To be able to record data (flow diagram).	**Hook – Creating a wildlife workshop** You could inform the children that they are going to be learning about how animals change, what animals need to survive and stay healthy. At the end of the term they will be visited by an 'audience'; this could be parents or other children. During this visit they must be able to share what they have learnt – maybe by showing pictures, drawing, photos, videos, etc. **Observing and recording the lifecycle of animals** This area of science could be made quite dry to children. With a little more pre-planning and a few resources it could be made much more exciting for them. **Videos – Animals and their offspring** When looking at the photos, ask the children to work out the order of the animal's life cycle. http://www.bbc.co.uk/learningzone/clips/african-animals-and-their-young/12646.html http://www.bbc.co.uk/learningzone/clips/what-are-baby-animals-like/12670.html **Ordering the stages of animals' development** How can you work out the order of the animals' life cycles? Provide children with pictures of different animals at various points in their development. Children will need to put together the pictures of the same animal. They will then order each of the animals' pictures from young to adult. It would be more challenging to include a range of different	• http://www.cleapss.org.uk/attachments/article/0/G206.pdf?Primary/Resources/Guides/ • http://www.cleapss.org.uk/attachments/article/0/L071.pdf?Primary/Resources/Guides/ • http://www.butterflyschool.org/teacher/raising.html • Pictures of various animals at many of their stages of development. • A variety of resources for keeping the minibeast/s being studied healthy. • Sketches of life cycles of a range of animals - http://www.kidzone.ws/ani

Learning Expectations	Possible Tasks	Resources
	types of lifecycles: 1. A chicken - http://learncreatelove.com/?p=8013 2. A frog - http://www.topmarks.co.uk/spring/FrogLifeCycle.aspx?age=ks2 3. A newt 4. A dragonfly 5. A butterfly **Investigating animals over time** This is an opportunity for the children to actually see the different stages of some animals' life cycles. A couple of possibilities are described below: **Ladybirds** Most minibeasts life-cycles are too long for children to observe all events from egg to adult but ladybirds are an exception. They have a life-cycle of 4 to 5 weeks. You can either try to find ladybirds yourself in early May (as described below), or purchase some. Only purchase ladybirds that are native to your area. You could purchase about 25 adult ladybirds for about £15. 1. Start breeding ladybirds in **early May**. The sexes are not easy to tell apart, so try to capture two that are pairing, or keep in a container until you see mating taking place. 2. After mating has occurred remove the male as he may eat eggs that the female lays. Keep the female in a transparent container and provide her with greenfly (aphids). 3. Remove the female to another container once she has produced one batch of eggs. By doing this, she might lay eggs in different containers, so there is more for children to observe. 4. Once the larvae have hatched from the eggs, be sure to provide plenty of greenfly or they may eat each other. 5. Each larva will moult 3 times and then turn into a pupa which should **not be disturbed**. After a further 4-6 days an adult will emerge	mals/lifecycle.htm • Ladybirds (adults) available from various suppliers (e.g. http://www.greengardener.co.uk/product.asp?id_pc=34&cat=75) • Caterpillars available from various suppliers – e.g. http://www.wwb.co.uk/ and http://www.insectlore-europe.com/ • Variety of materials for making containers in which to keep the minibeasts. • Minibeast eggs

Learning Expectations	Possible Tasks	Resources
	Butterflies/caterpillars **Caterpillar hunt – <u>Choose a warm sunny day in late spring or early summer</u>** and make some outdoor observations: • How many caterpillars? • Do any occur on more than one plant? • Do they occur on a particular part of a plant? • Can anyone find a caterpillar eating? Information on keeping caterpillars can be found at the bottom of these plans Please ensure that you have planned where to release any butterflies that you might have bought as caterpillars. Butterflies and their caterpillars are very fussy about the plants that they need to feed upon. **Other larvae** 1. **Beetle and fly larvae**. Look in rotting logs in spring. Keep some of the larvae on a piece of rotting log in a sealed transparent bag. 2. **Large plants galls.** Oak 'apples', thistle and rose galls are good sources. Cut one open to find a larva. Store again in a sealed transparent bag. **Eggs of minibeasts** **Egg hunt <u>– Spring to late summer</u>** is a good time to try and find the eggs of minibeasts. Places to look include: soil, damp crevices, under bark, under branches and stones, the under surface of leaves, and where leaves join the stem. Observation children can record outside: • Are the eggs attached to anything? • Are they easy to see? • Are they found on their own or in groups? • Where in the wildlife area were they found? (They could make a map)	

Learning Expectations	Possible Tasks	Resources
	Making observations of invertebrate eggs indoors As well as ladybird eggs, you could use: snails, slugs, cabbage butterfly and water snails. Keep eggs in a container on the material they were found on outside (unless it is likely to decay). Keep the temperature cool and even. **Tadpoles of frogs** **http://www.cleapss.org.uk/attachments/article/0/G206.pdf?Primary/Resources/Guides/** The website above provides all the information you will require for making sure that you look after tadpoles in careful manner. **Birds** Video. The following is a video of chaffinch chick being fed and growing - http://www.bbc.co.uk/learningzone/clips/the-growth-and-development-of-a-chaffinch-no-narration/7521.html A good idea is to install a webcam into a bird box. The children can then keep a diary to show how the changes that take place. Have these ready during the winter so that the birds can nest in them come spring time. **Recording** The children can keep their own diaries showing the development of the different animals over time.	
To know that animals have offspring that grow into adults. To be able to observe using simple	**Investigation over time – Chicken eggs** You could hire an incubator and some chicken eggs. There are companies now that will do this and ensure that the chicks are properly housed after you studies. **Recording** The children could keep their own diaries showing the development of the egg and chicks.	• Incubator • Chicken eggs

Learning Expectations	Possible Tasks	Resources
equipment.		
To know that human offspring grow into adults. To be able to record data (flow diagram).	**Stages of human development** **Visiting baby.** If possible, arrange for a mother and baby to visit. Children can discuss the differences between them and the baby. They begin to develop an idea as to how long it takes humans to develop. **Investigating children's clothes.** Children can sort children's clothes from different ages of children and discuss the changes that have occurred. **Studying photos of humans of different ages** Photos of children and their families. Once again the children can sort into order and then discuss changes. Video - http://www.bbc.co.uk/learningzone/clips/how-do-we-change-as-we-grow-older/56.html Recording Children could draw the different stages of human life. Measuring body parts of children of different ages Investigate relationships between age of children and size of body parts. Children can investigate the length of a body part (e.g. feet) of children of different ages across the school. To enable the children to measure using non-standard units, ensure that you have prepared a sheet with three	• Children's clothes (different ages) • Photos of the children and their families • Home-made measuring charts

Learning Expectations	Possible Tasks	Resources
	different colour lines starting from the same start line and going across the page. One of the lines should be length of some of the smallest feet in the youngest class; the other lines need to be longer. Children therefore only need to record the number of children with feet that are the length of a particular colour of line. Recording Children could show on a table the age of different children and the length of their feet. They could, with some support, show this information on a scatter graph.	
To be able to find out about and describe the basic needs of animals, including humans, for survival (water, food and air).	**A healthy lifestyle** When discussing the needs of humans it is best to consider the bigger picture; i.e. What makes a healthy lifestyle? The children's ideas might be stimulated by the following video: http://www.bbc.co.uk/learningzone/clips/a-healthy-lifestyle/2274.html **Animals have basic needs** Discuss with the children what they think the needs are for every animal in order for it to stay alive. Ones they might identify: to maintain a comfortable body temperature, to avoid being eaten, to have space to grow, to have food, to be able to take in oxygen, to be able to have young in a place where they can survive. **Survey – Finding animals and identifying their needs** Go outside and place out card strips on which are written the needs of animals. The children must find and capture different minibeasts and then work out the needs of these animals and how their habitats provide for these. **Recording** The children could draw each of their animals and then briefly explain how they survive. **Needs spinner**	• Card strips on which are written the needs of animals • Home-made 'Needs spinner'

Learning Expectations	Possible Tasks	Resources
	Create a spinner on which are written the different needs of animals. In small groups children can choose an animal picture from a pack and then spin the spinner. If it lands on 'avoid being eaten' then they must say how they think there animal avoids being eaten – e.g. long legs to run fast or good camouflage.	
To know the importance for humans of eating the right amounts of different types of food.	**Classifying – Which foods make a healthy diet?** Show children an example of a lunchbox. Discuss with children why some food when eaten in too large amounts is bad for our health – e.g. sugar, salts and fats. With the children, classify the foods in the lunchbox: green for foods we can eat quite a lot of, amber for those we can eat quite often, and red for foods we can eat as treats. Provide children with lunchboxes with different contents. They can classify each one using the 'green, amber, red system'. They can decide what advice they would give to the owners of each of the lunchboxes. **Recording** Children could draw an unhealthy and a healthy lunchbox.	• Lunchboxes containing different types and amounts of food.
To know the importance for humans of exercise. To be able to record data (table). To be able to perform a simple	**Importance of exercise** Discuss with children why it is important to exercise. They might identify: to maintain a healthy weight, to be flexible, to have strong muscles, to make sure organs like the heart and lungs are in good shape, and to make yourself feel good. Video - http://www.bbc.co.uk/learningzone/clips/the-importance-of-exercise/2268.html **Explore - What happens when you exercise?** The children could investigate what happens to their bodies when they try different forms of exercise. After exercise they could touch their foreheads to see whether they are warm, or feel their chests to find out whether their hearts are pumping faster and their lungs are working	•

Learning Expectations	Possible Tasks	Resources
test.	harder. **Investigate – Which exercise makes you puff the most?** Children could decide three different exercises to try. After doing each exercise a partner can hold a sheet of paper in front of the child and count the number of breaths (the paper moving upwards). Discuss with the children which exercise made their bodies work hardest. **Recording** The children could show on a table the different exercises and the number of breaths taken after each of them.	
To know the importance to humans of hygiene. To be able to record data (tally chart).	**Survey – How often do we wash ourselves?** Children could find out from each other how often they have to clean themselves. Recording Children could tally how many children perform particular cleaning activities each day: clean teeth, wash hands, have a shower, have a bath, wash hair, etc. Keeping food clean. Discuss the importance food hygiene wit the children. Recording Children could draw a poster showing how someone could look after their food: place in fridge/freezer, wash all container and cutlery, wash hands, etc.	•

Keeping caterpillars

You do not need a fancy insect terrarium to raise a caterpillar. Just about any container large enough to accommodate the caterpillar and its food plant will do the job. Since some caterpillars burrow in the soil to pupate, it's a good idea to line the bottom of your container with about an inch of slightly moist sand or soil. The soil should not be too wet – you don't want to end up with condensation on the sides of your jar. Other caterpillars hang from twigs or other surfaces to pupate. Add a stick or two, secured in the soil and leaning against the side. This also gives the caterpillar a way to climb back on its food plant, should it fall off. To keep the caterpillar's food plant fresh, place the stems in a small jar of water. Fill any space between the stems and the lip of the small jar with wadded paper towels or cotton balls to prevent your caterpillar from falling into the water and drowning. Put the small jar with the food plant into the caterpillar jar. When the butterfly or moth emerges, it will need a place to cling while it unfurls its wings and dries them. Once the caterpillar pupates, you can tape a paper towel to the wall of the jar or aquarium to give the adult a place to cling. Place the tape at the top, and allow the paper towel to hang freely to the bottom. Sticks also work well for giving the butterfly or moth a place to hang. You don't need to provide water – caterpillars get their moisture from the plants they consume. Cover the jar opening with a fine mesh screen or cheesecloth, and secure it with a rubber band.

If you don't know for sure what kind of caterpillar you've found, feeding it can be tricky. Most caterpillars are herbivores, eating only plants. Some caterpillars feed on a variety of food plants, while others consume only a specific plant. You can't force a caterpillar to eat something different – it will simply stop eating. A little trial and error may be required to find the proper food. Your first and most important clue is where you found the caterpillar. Was it on a plant? If so, there's a good chance that's its food. Take some cuttings of the plant, and be sure to include both new and old leaves, as well as flowers if the plant has bloomed. Some caterpillars prefer old leaves to new ones, and others may feed on the flowers. Offer the cuttings to your caterpillar, and see if it eats anything. If the caterpillar was not on a plant at the time you found it, you'll have to make some educated guesses about what to feed it. What plants are nearby? Start with those, taking cuttings and offering them to the caterpillar. If it eats one, you've solved the mystery and should continue to collect that plant for feeding. If you're still really stumped about the caterpillar's food preferences, you can try introducing one or more of the most common caterpillar food plants. Popular tree species include oak, willow, cherry, poplar, birch, apple, and alder. Some herbaceous plants, like dandelions and clover, are also common hosts for larvae. Whatever your caterpillar does eat, you will need an abundant supply of the food plant. Remember, a caterpillar's job is to eat and grow. As it gets bigger, it will eat more. You need to keep a fresh supply of food available to the caterpillar at all times. Change the food once most of it has been eaten, or if it starts to wilt or dry out. Since caterpillars eat a lot, they also produce a lot of droppings. You'll need to clean out the caterpillar's housing regularly. When the caterpillar is on its food plant, it's a fairly easy process. Just remove the food plant and the caterpillar, and let it continue munching away while you clean house. Make sure you clean out the small jar holding the food plant, too. If conditions become too moist in the housing, you may discover fungus forming in the soil layer. When that happens, be sure to remove the soil completely and replace it.

You won't need to do much once the caterpillar successfully pupates. Remove the food plant. The pupa can dry out if conditions become too dry, or become moldy if too damp. Some lepidopterists recommend removing the pupa from the caterpillar housing, but this isn't necessary if you check the jar once in a while. If the soil appears extremely dry and crumbly, a light spray with water will add a little moisture. If condensation appears on the jar, wipe it down.

Spring and most summer caterpillars may emerge as adults within a few weeks after pupating. Autumn caterpillars usually overwinter in the pupal form, meaning you will have to wait until spring to see the moth or butterfly. Keep any overwintering pupae in a cool basement or unheated garage, to prevent premature emergence. When the adult emerges, it will need time to dry its wings before it can fly. This may take a few hours. Once it is ready to fly, it may begin fluttering its wings rapidly, which can damage its wings if the butterfly or moth is left in the jar. Take the jar outdoors, preferably to the area where you collected the caterpillar, and release your butterfly or moth.

Year 2 – Animals including humans

Assessing children's knowledge and understanding of the nature, processes and methods of science

Learning expectation	Group 1 (lower ability)	Group 2 (average ability)	Group 3 (higher ability)	Comments
To know that animals, including humans, have offspring that grow into adults.				
To know that human offspring grow into adults.				
To be able to find out about and describe the basic needs of animals, including humans, for survival (water, food and air).				
To know the importance for humans of eating the right amounts of different types of food.				
To know the importance for humans of exercise.				
To know the				

importance to humans of hygiene.				
To be able to use observations to suggest answers to questions.				
To be able to record data (flow diagram).				
To be able to observe using simple equipment.				
To be able to record data (table).				
To be able to perform a simple test.				
To be able to record data (tally chart).				

Children <u>below</u> the learning expectations	**Children <u>above</u> the learning expectations**