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| Subject: Science Year: Phase 3 – Year B Animals and Evolution  NC/PoS:  Describe the changes as humans develop to old age. |
| Prior Learning (what pupils already know and can do)  Name and label the parts of the human body including the digestion system, skeleton and muscles. Know that animals, including humans, have offspring which grow into adults. The basic needs of animals, including humans, for survival is a balanced diet, water, air and shelter. Humans need the right amounts of nutrition from the food groups. The life cycle of a human is birth, growth, reproduction and death. |
| End Goals (what pupils MUST know and remember)   * Know the digestive system of most reptiles and amphibians include mouth, oesophagus, stomach, small intestine and large intestine. * Know the digestive system of a salmon includes mouth, teeth, tongue, oesophagus, stomach, intestine. * Know what a marsupial is and how it differs from other animals. Consider evolution of animals that are not found in other continents. * Know that some animals have more than one stomach to aid digestion e.g. alligator, cow. * Know how animals’ teeth are different. * Know animals have different lifespans * Know animals have different gestation periods. * Know that animals produce offspring that look like their parents and pass on characteristics. * Describe the differences in the life cycles of a mammal, an amphibian, an insect, and a bird * describe the life process of reproduction in some plants and animals * Know that there are distinct types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. * Know that sexual reproduction in plants involves pollen from one flower fertilising the egg of another to produce a seed. * Know asexual reproduction in plants happens without pollen or an egg. The new plant grows from cuttings from the parent plant. * Know the life cycle of a dolphin (mammal) - live young born and get milk from mothers, grow from babies to adults, reproduce * Know the life cycle of a newt (amphibian)- egg in jelly laid in water, develops tail, and legs, grows lungs to breathe and leaves water, takes 2 years to grow to adult size * Know the life cycle of a butterfly (insect) - eggs laid by the female insect; eggs hatch and larva are born; when the larva moults for the last time, a pupa is formed * Know some insects only have 3 stages: born as an egg, hatches as a nymph and changes into an adult * Know the life cycle of a robin (bird) – egg, hatches and is fed by the parents, juvenile– leaves the nest when flight feathers are grown, adult attracts mate to reproduce * Know the life cycle of an alligator (reptile) - egg, hatches able to feed itself but stays with mother for at least a year, juvenile, adult * Identify how animals are adapted to suit their environment in diverse ways and that adaptation may lead to evolution: sealion, different butterflies, different breeds of hen, breeds of dog, different fish and sharks, different birds. * Know most animals can only live in certain environments, know animals are adapted to their habitat * Know living things can develop adaptations to suit the place they live. * Know that the living things that are best adapted to their habitat are more likely to survive. * Know that over time, increasingly of the animals will end up with features that make them well-adapted to their habitat. * Know when living things change over time – this is evolution. |
| Key Vocabulary:  mouth, tongue, oesophagus, stomach, small intestine, large intestine, rectum, anus, water, air, food, shelter, gestation period, life span, species, pattern, offspring, asexual, sexual, reproduction, Life cycle, hatch, mammal, amphibian, fish, bird, reptile, inheritance, heredity, traits, characteristics, climbers, deciduous, evergreen, defence, inheritance, heredity, traits, characteristics, evolution, changes over time, natural selection, fossil |
| Session 1: Recap: what is the digestion system – name the parts and their function. What are the basic needs of all animals?  Introduce careers: geriatric medicine <https://www.youtube.com/watch?v=584Eh0cXa1Y>  paediatrician <https://www.youtube.com/watch?v=ZKKNQ_lA1HQ>  Children to be split into groups to research the digestion of different creates and then present back to the class. most reptiles and amphibians include mouth, oesophagus, stomach, small intestine and large intestine.  Children to research the digestive system of a salmon, alligator, cow, human, bird.  Vocabulary: mouth, tongue, oesophagus, stomach, small intestine, large intestine, rectum, anus, water, air, food, shelter |
| Session 2: Recap the digestive system of a salmon.  Introduce that animals have different life spans and different gestation periods.  Children know the differences in the life cycles of a mammal, an amphibian, an insect, and a bird  Children to look at for any patterns between life span and gestation periods.  [| STEM](https://www.stem.org.uk/resources/elibrary/resource/35389/animal-gestation-periods)  Children complete a table using secondary sources of information which look at gestation period, average number of offspring and the life span of the animal. They then answer questions which look at patterns in the data and go on to predict the length of gestation and number of offspring for different sized animals.  Vocabulary: gestation period, life span, species, pattern, offspring |
| Session 3: Recap: what is life span and gestation period? Ask the children what the gestation period of previously researched species.  Introduce asexual and sexual reproduction in plants and animals. [What are the stages of a plant's life cycle? - BBC Bitesize](https://www.bbc.co.uk/bitesize/articles/zyv3jty)  Children to research the stages of asexual reproduction in plants and compare with the sexual reproduction of a plant. Children to learn about the asexual reproduction of an animal.  Vocabulary: asexual, sexual, reproduction |
| Session 4: Recap asexual and sexual reproduction of a plant, can the children identify the stages?  Split the children into groups to research the life cycle of different species. Children are then to present back to the rest of the class. Children to look at the life cycle of a dolphin, newt, butterfly, butterfly, robin, alligator.  Vocabulary: Life cycle, hatch, mammal, amphibian, fish, bird, reptile. |
| Session 5: Recap the life cycle of a newt.  Recap: What do all animals need from their habitat? Name 5 different habitats  Children learn that humans can live all over the world because they can wear clothes and build houses suited to different conditions. Most plants and animals can only live in certain environments. Animals and plants are adapted to their habitat.  LO: To Research animals that have adapted to suit their environment  <https://www.youtube.com/watch?v=ZT8YswmQuAg&t=133s> watch mud skippers 15.15 – 18.55   * The otter has special adaptations: eyes and nostrils that close underwater, webbed feet to move in water and long whiskers to feel vibrations to help find food * A bullfinch has a short cone-shaped beak for cracking seeds and a toe pointing backwards so they can perch * The camel has adaptations to survive hot environments: store water in their bodies, sandy for camouflage, big feet to stop sinking into sand, loses less water through small amounts of sweat and wee and most of its body fat in hump to able to lose heat via rest of body * The penguin has adaptations to survive cold environments: rounded body shape to reduce heat loss, streamlined body for swimming, a layer of fat all over body for warmth, oily feathers to keep them waterproof and webbed feet   N.B: adaptation means the process of change by which an organism or species becomes better suited to its environment.  Introduction to Charles Darwin <https://www.youtube.com/watch?v=JOk_0mUT_JU>  Introduction to Alfred Wallace <https://www.youtube.com/watch?v=KT2YbugYcjQ>  and to evolutionary biologists  Vocabulary: adaptation, habitat, environment, species. |
| Session 6: Recap: how have the following adapted to their environment: camel, penguin, otter, and bullfinch? Why?  Children learn living things can develop adaptations to suit the place they live. The living things that are best adapted to their habitat are more likely to survive. Over time, increasingly the animals and plants will end up with features that make them well-adapted to their habitat.  Lo: to research plants that have adapted to suit their environment  Watch <https://www.youtube.com/watch?v=moOCK8OggBw> (4.55 – 6.40)   * a cactus has: long roots to find water, fleshy stems to store water and thin needle leaves to limit water * water lilies, float on the surface of the water. Water lilies can thrive in muddy water because of this adaptation. Since their leaves float, they can easily take in light. The light does not have to go through muddy water in order to reach the leaves. * Plants in the lowest part of the rainforest are short and grow close to the ground. Since very little light gets to this part of the rainforest, these plants adapted to have very large leaves. The sizable surface area of their leaves allows them to catch as much light as possible, which helps them survive.   Look at the adaptation sheet for plants and observe plants in the school grounds and discuss how they have adapted. Research other plants’ adaptations  Vocabulary: climbers, deciduous, evergreen, defence |
| Session 7: Recap: how have the following adapted to their environment: deciduous trees, ivy, cactus, water lilies? Why?  Children learn that animals and plants produce offspring that look like their parents. Parent plants or animals pass on characteristics.  LO: to observe how offspring are not identical to their parents  Watch <https://www.youtube.com/watch?v=K3F5BV82Lg8> for teachers  <https://www.youtube.com/watch?v=GqEConjFPvg> looking at dogs  Usual human inherited traits: hair colour, eye colour, shape of nose, dimples, hairline, height  N.B: Inheritance - something is passed on to the next generation. Offspring are not identical to their parents and some characteristics are inherited. Other differences new in the offspring – mutations  Vocabulary: inheritance, heredity, traits, characteristics |
| Session 8: Recap: why are offspring not identical to their parents? Name 3 inherited traits  Children learn when living things change over time – this is evolution. Charles Darwin’s (an English naturalist) scientific theory of evolution by natural selection became the foundation of modern evolutionary studies. An example of evolution is Darwin’s finches – beaks adapted over time based on food source.  Lo: To observe how Darwin’s finches adapted and evolved  <https://www.youtube.com/watch?v=s64Y8sVYfFY>  Research and use finches' sheet to observe differences  N.B: Evolution - a change in the characteristics of living things over time. It happens when there is competition to survive (natural selection). Happens when there are differences within a species caused by inheritance and mutations.  Vocabulary: evolution, changes over time, natural selection |
| Session 9: Recap: how did Darwin’s finches adapt and why?  Children learn that fossils show how living things have changed – how they have evolved  LO: to compare fossils to modern animals  <https://www.youtube.com/watch?v=fEYJUk3sz8c> fossils and evolution  <https://www.youtube.com/watch?v=pktDqFy5IcE> David Attenborough  Compare woolly mammoth fossil to an elephant  Look at evidence of horse evolution over last 50 million years  N.B: Evolution - a change in the characteristics of living things over time. It happens when there is competition to survive (natural selection). Happens when there are differences within a species caused by inheritance and mutations.  Vocabulary: evolution, changes over time, fossils |
| Link to career:  geriatric medicine <https://www.youtube.com/watch?v=584Eh0cXa1Y>  paediatrician <https://www.youtube.com/watch?v=ZKKNQ_lA1HQ> |
| Scientists who have helped develop understanding in this field:  Charles Darwin  Mary Annings |