Living things and their habitats

Statutory requirements

Pupils should be taught to:

♣ describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals

♣ give reasons for classifying plants and animals based on specific characteristics.

Notes and guidance (non-statutory)

Pupils should build on their learning about grouping living things in year 4 by looking at the classification system in more detail. They should be introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. Through direct observations where possible, they should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). They should discuss reasons why living things are placed in one group and not another. Pupils might find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification.

Pupils might work scientifically by: using classification systems and keys to identify some animals and plants in the immediate environment. They could research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.

Year Group = 6

AFL Questions:

- How do we know something is alive?
- How does classifying living things help/benefit scientists?
- Do you agree that all micro-organisms are harmful?
- What is the same/different between a vertebrate and an invertebrate?
- Why do you think that humans have become the dominant living species on the planet? Is it a good or a bad thing to have one dominant species? What impact could this have for the future?

Animals including humans

Statutory requirements Pupils should be taught to:

♣ identify and name the main parts of the human circulatory system, and describe 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.

Notes and guidance (non-statutory)

Pupils should build on their learning from years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system) to explore and answer questions that help them to understand how the circulatory system enables the body to function. Pupils should learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body.

Pupils might work scientifically by: exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.

Year Group = 6

AFL Questions:

- If one organ from the human circulatory system was removed/damaged, would/could a human survive?
- How can humans optimise their body to function at its best?
- What impact would severe dehydration have on a living thing? Is this the same/different for plants and animals?
- Do drugs always have a negative impact on the human body?
- What impact does exercise have on the circulatory system directly after vigorous exercise? Why is this impact not consistent?

Evolution and inheritance

Statutory requirements

Pupils should be taught to:

♣ recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago

♣ recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents

♣ identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Notes and guidance (non-statutory) Building on what they learned about fossils in the topic on rocks in **Year 3**, pupils should find out more about how living things on earth have changed over time. They should be introduced to the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, labradors are crossed with poodles. They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox. Pupils might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution.

Note: At this stage, pupils are not expected to understand how genes and chromosomes work. Science – key stages 1 and 2 33 Notes and guidance (non-statutory)

Pupils might work scientifically by: observing and raising questions about local animals and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.

Year Group = 6

AFL Questions:

- Why are fossils a useful source of information for learning about the past?
- How does knowing about the past impact our knowledge of what may happen in the future?
- Based on knowledge of evolution in humans up to the present day, how do you think humans will have evolved in another 1000 years' time? Why?
- Why do we not look identical to either of our parents?
- What benefits to survival are there by inheriting certain physical characteristics to one or both of our parents?
- Why is it important that plants adapt to suit their particular environment?

Light

Statutory requirements

Pupils should be taught to:

♣ recognise that light appears to travel in straight lines

♣ use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye

♣ explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes

♣ use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Notes and guidance (non-statutory)

Pupils should build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection and shadows. They should talk about what happens and make predictions.

Pupils might work scientifically by: deciding where to place rear-view mirrors on cars; designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works.

They might investigate the relationship between light sources, objects and shadows by using shadow puppets. They could extend their experience of light by looking a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur).

Year Group = 6

Opportunities to promote curiosity:

Explore light in fairground rides

Investigating shadows

Making a periscope

Mirroring games - dance

AFL Questions:

- What happens to the shadow? Why? (Investigation into the size and shape of an object depending on how close to the light source it is.)
- What factors the size and shape of a shadow?
- How do we see the colour of an object?
- What is refraction?
- Opaque, translucent and transparent. Differences between them. How can we tell which material/object is which? How does it impact on light?

Electricity

Statutory requirements

Pupils should be taught to:

♣ associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit

♣ compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches

♣ use recognised symbols when representing a simple circuit in a diagram. Notes and guidance (non-statutory) Building on their work in **Year 4**, pupils should construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. They should learn how to represent a simple circuit in a diagram using recognised symbols.

Note: Pupils are expected to learn only about series circuits, not parallel circuits.

Pupils should be taught to take the necessary precautions for working safely with electricity.

Pupils might work scientifically by: systematically identifying the effect of changing one component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or some other useful circuit.

Year Group = 6

AFL Questions:

- What factors could impact on the brightness of a bulb?
- Before beginning an experiment involving electricity, what steps would you take to ensure you were going to be safe?
- Will an electrical component e.g. a buzzer work wherever you place it in a series circuit? Which element of the circuit is vital to ensure this happens?
- What impact does a higher voltage have on a series circuit?