YEAR 4: SPRING 2 – OCEAN SURVIVORS
SCIENCE: Living things and their habitats

UNDERSTAND, DESCRIBE AND EXPLAIN: CLASSIFICATION

To understand that living things can be grouped in a variety of ways using classification keys

Living things	***Classify/Group***	***Classification***	***Common traits***	***Binomial name***	***Living organisms***	***Classification key***
Animals	***Habitat***	***Plants***	***Flowering***	***Non-flowering***		
Vertebrates	***Fish***	***Amphibians***	***Reptiles***	***Mammals***	***Birds***	
Invertebrates	***Marine invertebrates***	***Molluscs***	***Crustaceans***	***Worms***	***Insects***	***Spiders***

Classification is the method used by scientists to ***order living organisms*** by ***traits*** they have in ***common***. All species have a ***unique classification*** that results in a ***binomial name***. ***Vertebrates*** are an example of a classification group. Within each group, there are ***more specific classification groups*** until you can, eventually, ***classify/name*** an individual organism.

Learning links:

Science:

Y6: Living things and habitats
Classification system/ Vertebrates/ Invertebrates/Living things/Habitat

THINKING POINT:

Why do we need a classification system for all living things?

One way to classify living things is by whether they have a backbone (vertebrate) or not (invertebrate).

Classifying Vertebrates (have a backbone):

Fish: Fish are animals that ***live in the water***. They have ***gills*** that allow them to ***breathe under water***. Different species of fish may live in fresh water or salt water. Some examples of fish include the brook trout, the great white shark, lionfish, and the swordfish.
Birds: Birds are animals that ***have feathers, wings, and lay eggs***. Many, but not all, birds can fly. Some examples of bird species include the bald eagle, the cardinal, the flamingo, ostriches, and the red-tailed hawk.
Mammals: Mammals are ***warm-blooded*** animals that ***nurse their young*** with milk and ***have fur or hair***. Some examples of mammals include humans, dolphins, giraffes, horses, and spotted hyenas.
Amphibians: Amphibians are ***cold-blooded*** animals. They ***start*** out their ***lives*** living in the ***water with gills*** just like fish. Later, they ***develop lungs*** and can ***move to dry land***. Amphibians include frogs, toads, newts, and salamanders.
Reptiles: Reptiles are ***cold-blooded*** animals which ***lay eggs***. Their ***skin*** is covered with ***hard and dry scales***. Reptile species include alligators, crocodiles, snakes, lizards, and turtles.

THINKING POINT:

What are the main differences between amphibians and reptiles?

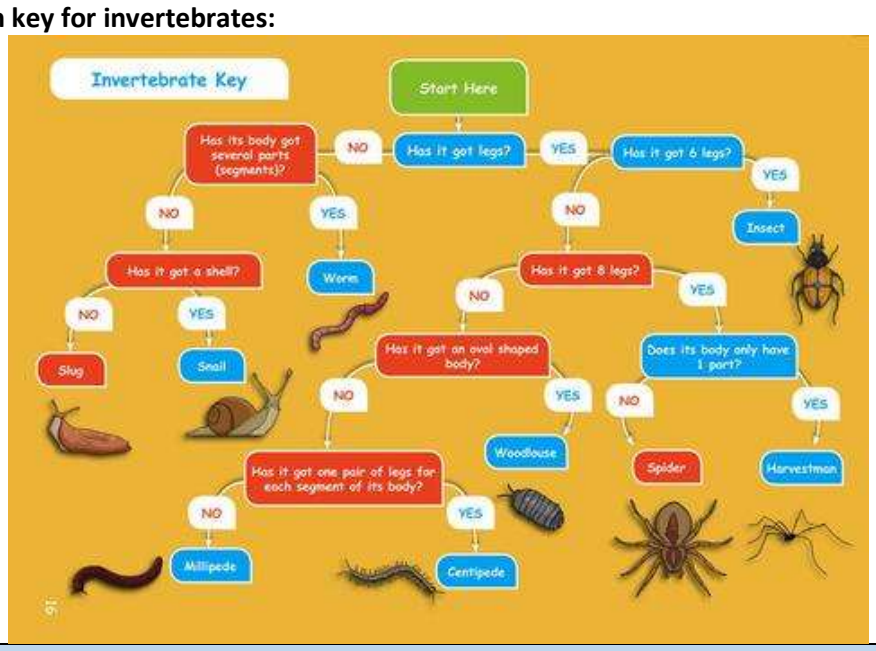
Classifying Invertebrates (no backbone):

Marine Invertebrates: There are a wide variety of interesting ocean animals that are invertebrates. These include sponges, corals, jellyfish, anemones, and starfish.
Molluscs: Molluscs have a ***soft body*** that is ***covered*** by an ***outer layer*** called a ***mantle***. Many molluscs live ***inside a shell***, but not all of them. Some examples of molluscs include squid, snails, slugs, octopuses, and oysters.
Crustaceans: Crustaceans are a type of ***arthropod***, meaning that they have ***jointed legs***. They also have an ***exoskeleton*** (their ***bones*** are on the ***outside*** like a shell). Some examples of crustaceans are crabs, lobster, shrimp, and barnacles.
Worms: The term "worm" is not a scientific word, but is often used to refer to ***invertebrate*** animals that ***don't have legs***. Worms may live in the soil, in the water, or even inside other animals as parasites. Some examples include the tapeworm, the leech, and the earthworm.
Insects: Insects are part of the ***Earth's largest animal group***, the ***arthropods***. There are over ***1 million species*** of insects including such animals as the grasshopper, dragonfly, yellow jacket, butterfly, and praying mantis.
Spiders, Centipedes and Scorpions: These animals are all part of the ***arthropod group***. Spiders and scorpions are ***arachnids*** because they have ***eight legs***. Centipedes and millipedes are ***myriapods*** and have ***lots of legs***.

THINKING POINT:

What are the main differences between insects and spiders?

Here is an example of a classification key for invertebrates:



EXPLORE AND INVESTIGATE:

HYPOTHESISE
ENQUIRE
TEST
RECORD
REPORT
CONCLUDE

To classify animals and plants in to groups:
Guided by the teacher, exploring the school grounds or local area, find a wide selection of living things that include animals and flowering plants and non-flowering plants. If it is unlikely that living things will be found, hidden images of selected living things could be used.
Once found, pupils can use a classification key to put:

- Vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals.
- Invertebrates into snails and slugs, worms, spiders, and insects.
- Plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants, such as ferns and mosses.

Classify the living things in to groups and record this with explanations. Can the children classify and name the trees of Ocean Academy?

KEY ASSESSMENT AND APPLICATION OPPORTUNITIES:

EXS:

1. Describe what classification is and why living things are sorted into categories.

GDS:

1. Explain how you know that bats/dolphins/frogs are mammals/fish/reptiles/birds/amphibians.

YEAR 4: SPRING 2 – OCEAN SURVIVORS
SCIENCE: Living things and their habitats

UNDERSTAND, DESCRIBE AND EXPLAIN: HUMAN IMPACT

To understand that environments can change and that this can sometimes pose dangers to living things

Environments	***Habitats***	***Natural Resources***	***Pollution***	***Deforestation***	***Global warming***	***Conserving***	***Sustainability***
Littering	***Fossil fuels***	***Population***	***Conservation***	***Nature reserve***	***Impact***	***Living things***	

Learning links:

History:

Y3: Stone Age
The beginning of agriculture & farming

Learning links:

Geography:

Y5: Rainforest/Biomes
Deforestation/ Sustainability/ Human impact

The human impact on the Earth:

Since ***farming*** began, ***10,000 years ago***, many ***wild landscapes*** have been ***transformed*** to create fields for ***crops*** and ***raising animals***. ***Swamps*** and coastal ***marshes*** have been ***drained***. ***Forests*** have been ***felled*** and ***grasslands*** have been ***ploughed***.
This has had a ***massive impact*** on the wildlife of the Earth.
Over ***six billion people*** live on planet Earth. As the population grows, we are taking ***more and more land*** to live and using up more of the world's ***natural resources***. Many human activities also ***produce pollution***, which is ***damaging*** the Earth's ***environment***.
One of our main challenges is to find the right ***balance*** between ***using and conserving*** Earth's ***natural resources***. The human species dominates Earth in a way that no species has done before. Our ***demands*** for ***fuel, water, land, and food*** are beginning to place a ***strain*** on the planet's limited ***resources***.
All over the world, factories, power plants, farms, businesses, and homes ***produce huge amounts of pollution*** by releasing chemicals and other substances that ***pollute***, or dirty, the ***natural environment***. As people's use of energy and other resources grows, the Earth is becoming more polluted. However, what makes ***humans different*** from other species, is our ***ability to recognise*** these ***global problems*** and our ***inventiveness*** in ***doing something*** about them – to ***live sustainably***.

THINKING POINT:

Why is the earth becoming more polluted?

Humans' negative impact:

Rising population: The ***rising population*** of humans means that more ***wild space*** is being ***flattened and built on*** to create more housing, factories, shopping centres, wider roads and more space for farming. By destroying the wild space, we are ***destroying the habitats*** of the local wildlife. If this wildlife is unable to find a new habitat, it will die.

Littering: The rise in ***plastic and synthetic packaging*** has had a negative impact on wildlife across the world. Animal ***habitats*** are being ***ruined*** by vast amounts of litter and ***dangerous chemicals*** are released in to nature by this synthetic packaging. Many animals are ***dying through suffocation*** when being caught up in plastic litter in their natural habitat. Plastic packaging takes thousands of years to ***biodegrade*** (naturally disappear).

Burning Fossil Fuels and pollution: To ***create energy*** (electricity, power, heat) factories are ***burning fossil fuels*** like oil, coal and natural gases which are being taken from deep in the ground. Burning these fuels ***creates poisonous and dangerous smoke and gases*** to be released in to the air making it harder for plants to take in the carbon dioxide that they need and also contributing to ***global warming*** by ***harming the atmosphere***.

Deforestation: Wood is a ***valuable natural resource*** used by humans for many reasons. In order to produce the wood needed, large numbers of trees and ***huge areas of forest must be cut down***. This is ***destroying the habitats*** of many living things and adding to the pollution of the air as there are ***less trees to remove the carbon dioxide*** from the air. Also, when trees are cut down, they ***release the carbon dioxide*** stored within them in to the ***atmosphere***.

THINKING POINT:

If you could stop one of these negative impacts today, which would you choose and why?

Humans' positive impact:

Conservation projects: Without human intervention, many species of plant and wild life would ***die out and become extinct***. There are many human-led conservation projects, which are ***protecting*** the ***wild spaces*** of the world, protecting ***species from extinction*** and maintaining and ***restoring habitats***. Conservation projects ensure that ***wildlife*** is ***well looked after*** and ***flourishes*** in a healthy habitat.
Ecologically planned reserves/gardens/parks: More and more humans are ***designing havens for wildlife*** – the ***perfect habitats*** for wildlife to thrive. In schools, businesses, hotels and individual homes, people are creating ***mini-reserves*** to encourage wildlife to grow: bug hotels, ponds, wild gardens… This supports wildlife and encourages their development.
Sustainable use of resources: Major ***companies*** and corporations are now being ***regulated*** to ensure that they are ***using their resources sustainably***. For example, companies who use wood as a product must plant a tree for every tree that they chop down and there are limits on what they are allowed to use. Areas of land and wildlife are now protected and are not allowed to be farmed or destroyed.
Changing perceptions and raising awareness: Humans are being ***made more aware*** of the ***impact*** that they are having on the ***natural world*** and what they have a ***responsibility*** to do to ensure that we look after our Earth. For example: Major governments are making plans to be '***emissions and waste free'*** in the near future. Lots of companies are ***reducing the amount of plastic*** they use too. Major contributors to litter and pollution come from plastic packaging, bags straws and bottles. Lots of shops are offering ***paper alternatives*** now.

THINKING POINT:

Which of these options do you think can have the biggest impact?

EXPLORE AND INVESTIGATE:

HYPOTHESISE
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Litter Biodegradability Test:
The children will test the biodegradability of different materials and, once discarded, how long it will take for a material to biodegrade.
Materials to test:

Crisp packet	Newspaper	Drinks Can	Drinks bottle	Plastic bag	Paper bag

In a washing up bowl filled with cold water (to represent a river/stream), one at a time, place each item in to the water.
With a large spoon, stir the water in one direction 10 times to represent the current of the stream/river.
Remove the item from the water and observe what has happened – has it been degraded at all? If yes, where has it gone? If no, why not?
Repeat the process to see what happens to the different items: has the can or bottle or crisp packet changed at all? Why not? How could this be harmful to the environment and the habitats of living things?
What has happened to the paper items? Have they really vanished? Where have they really gone? Is that good for marine life?
Explain that the following items take a very long time to biodegrade and, even when they do, the chemicals released in to the environment is harmful to living things and their habitats.

Crisp packet 100 years	Newspaper 3-6 weeks	Drinks Can 500 years	Drinks bottle 450 years	Plastic bag 1,000 years	Paper bag 3-6 weeks

KEY ASSESSMENT AND APPLICATION OPPORTUNITIES:

EXS:
1. Identify what humans do that negatively affects plant and animal habitats. Explain how people in our local community could live more sustainably.

GDS:
1. As a conservationist, how could we make Ocean Academy a better place for the environment and local wildlife? Can you persuade Mrs Quarrie?