FOOD CHAINS & KEYSTONE SPECIES

(Key Stage 2/3)

LINKS TO NATIONAL CURRICULUM

Science

Living things and their habitats (Y4)

Pupils should be taught to:

- recognise that living things can be grouped in a variety of ways
- recognise that environments can change and that this can sometimes pose dangers to living things
- construct and interpret a variety of food chains, identifying producers, predators and prey

Key Stage 3

Pupils should learn about the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops

- how organisms affect, and are affected by, their environment

KEY QUESTIONS

1. **What is a food chain?**
2. **What is meant by a keystone species?**
3. **What are some other examples of keystone species?**
4. **How can we use our knowledge about keystone species to help the environment?**

Notes to Teachers

- These teaching notes run alongside a Powerpoint presentation and all slides are referred to in the notes. The information can be adapted to suit different ages of students by adding/deleting slides on the presentation and varying the level of detail used from the teacher notes.
- Activities given are suggestions only. The main purpose of these resources is to provide key information and visual aids for teachers to adapt to their needs.

KEY WORDS (in alphabetical order)

Biodiversity: The variety of living organisms in a given place.

Carbon dioxide: a gas that is formed by burning fuels, by the breakdown or burning of animal and plant matter, and by the act of breathing, and that is absorbed from the air by plants in photosynthesis.

Climate change: a large-scale, long-term shift in the planet's weather patterns and average temperatures.

consumer – an organism that feeds on other organisms. Consumers include herbivorous animals which feed on plants and carnivorous animals which feed on other animals. **Primary Consumer** - Animals that consume only plant matter. They are herbivores - eg rabbits, caterpillars, cows, sheep, and deer.

Decomposer - an organism such as bacteria and fungi that breaks down dead organisms and their wastes. . (They do not 'eat' the food like scavengers, as they have no mouth-parts. Instead they break down solid matter into liquids which they can absorb.)

Ecosystem: A community made up of all the living things in an area and the way they affect each other and the environment.

Food chain: the transfer of energy from one species to another.

Food web: the links between multiple food chains.

Habitat: The place or environment where a plant or animal naturally or normally lives and grows.

photosynthesis – a process by which green plants and other organisms turn carbon dioxide and water into carbohydrates and oxygen

Predator - a carnivorous animal that hunts, kills, and eats other animals in order to survive, or any other organism that behaves in a similar manner

Prey - an animal or animals caught, killed, and eaten by another animal as food

Producers – an organism that manufactures its own food from simple inorganic substances, e.g. a green plant

Species a group of similar organisms that can breed with one another to produce fertile offspring

Secondary Consumer - Animals that eat primary consumers (herbivores).

Tertiary Consumer - Animals that eat secondary consumers ie carnivores that feed on other carnivores.

Trophic cascade - an ecological term for a process of change that starts at the top of a food chain affects every species right down to the bottom

1. What is a food chain?

SUGGESTED STARTER ACTIVITY

Slide 3: Ask the children to discuss where they got their energy to come to school from this morning. Explore the idea that people get energy from the food they eat. How does the energy get into the food? Pairs of children try to trace their breakfasts back as far as they can. Eg. cereal was once growing in a field. An egg came from a chicken which once ate grain that was once growing in a field. How does the plant in the field get energy?

TEACHING INPUT

Slide 4: Without energy from nutrition, we could not live. This is true of every living thing on Earth. Microbes, worms, mice, hawks, flowers, fish, grass, trees, humans: if it's alive, it needs energy. All energy comes first from the sun... but how does that then help power a human? To understand that, we need to know a bit about where our food comes from.

Slide 5: Plants are able to draw nutrients and water from the soil through their roots. They also use **carbon dioxide** from the air and, with this combination, they can use a chemical process, called **photosynthesis**, to produce food from the sun's energy. This process happens inside the plant's leaves. Sunlight provides the energy needed for photosynthesis to take place. In this process carbon dioxide and water are converted into oxygen (a waste product that is released back into the air) and glucose (the source of energy for the plant).

Slide 6: Plants are **producers** of energy, as they make their own food (using sunlight, soil, and other elements). A producer makes food for itself and others can then feed off it. A producer is the first link in a **food chain**. It is often a green plant.

Slide 7 - 10 : Whilst plants are producers, animals are **consumers,** because they have to eat (consume) other animals and plants. There are four different types of consumers in the animal kingdom. A **carnivore** is an

animal that only eats other animals. A **herbivore** is an animal that only eats plants. An **omnivore** is an animal that eats both plants and animals.

Animals that eat only plants (herbivores) are called **primary consumers**. Primary means 'first' and these animals are the first consumers in a food chain.

Animals that eat herbivores are called **secondary consumers**, because they are the second animal in the food chain. Those that eat other primary and secondary consumers are called **tertiary** (third) **consumers**.

Let's have a look at how a food chain might work.

Slide 11: Here, we can see the way that energy passes from one animal to another as they eat plants, or one another. This flow of energy from one living thing to another is called a "food chain."

A food chain shows how each living thing gets its food. It shows what is eating what. The arrows here mean "is eaten by" .

Grass → Grasshopper → Toad → Snake → Hawk

The grass is eaten by the grasshopper, which is eaten by the toad, which is eaten by the snake, which is eaten by the hawk!

A food chain always starts with a plant, usually a green plant. All plants are producers. All the animals in a food chain are consumers. A food chain ends with a **predator** at the top of the chain.

Slide 12: Whereas a food chain shows just one set of links between animals finding food, a **food web** is made up of lots of food chains.

For example, the hawk above may also have eaten a mouse, a squirrel or a frog. The snake might have eaten beetles, caterpillars or other small animals. So a food web connects all the different food chains together. Here is a simple food web showing what some animals in a Savanna **ecosystem** might have eaten.

Slide 13: A predator is an animal that kills other animals to eat them. The animals that they hunt or kill to eat are called the prey. Some animals, called scavengers, eat other animals that are already dead. If a predator is

at the top of a food chain, meaning that there are no other animals in their ecosystem which hunt them, they are called the apex (top) predator.

Slide 14 - 15 : Decomposers are any organism within a food chain that break down organic material. Fungi and bacteria are examples of decomposers. They feed on decaying matter, such as dead animals and plants. This speeds up the decaying process that releases mineral salts back into the food chain ready for plants to absorb all over again and begin a new food chain. The recycled organisms are converted by the decomposers into chemical nutrients like carbon and nitrogen that are released back into the soil, air and water of an ecosystem. Without decomposers, dead animals and organisms would not be recycled into other living matter and would just pile up!

Slide 16: We call the whole community of organisms, animals, plants and microbes, together with their physical environment an ecosystem. Energy is transferred round through food chains and webs. All of the different organisms in the system play a part in helping keep things running smoothly. So what happens if part of the ecosystem is harmed?

SUGGESTED ACTIVITIES

Food chain dance

Using masks or props to represent different elements of a food chain, children work out moves to show which element is consumed by what. This can be an effective way to explain work on food chains in a whole school assembly. It also works well as a PE warm up activity, with children being allocated different roles in the food chain.

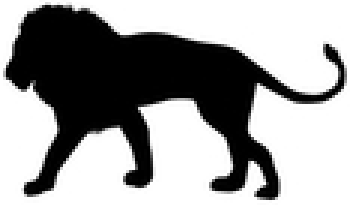
Food chain linking

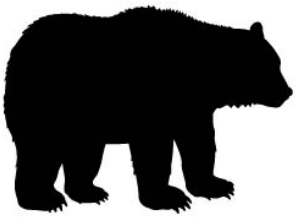
Using the animal and plant cards (provided below) ask the children to work in small groups to build the longest food chain that they can. Challenge them to use as many of the cards as possible to create a food web. Can they make their own cards to extend this?

Animal sort

Provide children with animal/ plant cards (below) and ask them to group them in different ways. This can be a useful assessment tool. Don't provide any criteria, but ask children to recombine the cards to show learning. For example a cow could be in the 'consumer' group WITH lion if the grouping is 'producers and consumers' but would be in a different set for 'herbivores and carnivores'. Challenge pupils by asking them to: 'sort into sets where x would be in same group as y'

Food chain sorting cards

deer	coral
 lion	hawk
frog	snake
leaves & grasses	grasshopper

spider	shark
wolf	trees
giraffe	turtle
hare	 bear

elk	raven
sea grass	cow
otter	beaver
mouse	parrotfish

2. What is meant by a keystone species?

SUGGESTED STARTER ACTIVITY

Slide 17: Provide games of 'Jenga' for children to play in small groups. Ask them to explain why the towers eventually fall down. Some of the blocks can be removed without the whole structure falling down, but if a particular block is removed, the others that are resting on it will topple.

TEACHING INPUT

Slide 18-19: In an arch, the keystone is the stone at the very top. It holds the top of the curve and pressure keeps all of the other bricks in place. In an ecosystem, a keystone species acts in the same way. It is a crucial organism that keeps the whole system together. Without this species, the ecosystem would look very different, or may collapse altogether.

As the term 'keystone species' is not a formal designation, scientists have different thoughts about which species should have the title (as all are important). However, it is a helpful way for the public to start to understand just how important the survival of one species can be for many others. The different groupings for these species also vary, but a common one is to sort them into predators, ecosystem engineers, or mutualists.

Slide 20: The tiger shark is a keystone predator and in Australia, their presence is vital to protecting seagrass beds. Sharks help ecosystems by catching fish which are old and ill, leaving healthier fish to flourish. They also prevent another species, the sea turtle, from becoming too prevalent in one place.

Slide 21 - 22: Sea turtles are a popular meal for a tiger shark. The turtles in turn feed on seagrass, which is food and home to many other organisms. Scientists have realised that when there are not many tiger sharks in an area, turtles will gather and quickly wipe out the seagrass beds in a particular area. However, with sharks around, the turtles are forced to graze a far wider area, which prevents the sea grass from being over-grazed.

Slide 23: Beavers are an example of an ecosystem engineer. The way that they build their homes has an amazing impact on other species in their ecosystem.

When European Colonists first arrived in North America, it's estimated that there were around 400 million beavers living in the country. Beavers live in dams which they build out of old and rotting wood. The beavers create these dams by gnawing down old branches with their strong teeth and dragging them into long piles. This has a variety of benefits.

Slide 24 - 25: Firstly, the removal of the older trees, allows new and healthy trees to grow and release oxygen into the air.

Secondly, the beaver's dams change the course of rivers, creating wetlands. These habitats support a huge amount of life. In some dry areas, the wetlands created by beavers can support 80 percent of that region's species whilst covering just 2 percent of the landscape. The wetlands become home to many more animals and plants, which become food for others and so, on, until the whole ecosystem is altered. All because of the beavers.

Beavers dams are also helping in other ways. As the planet heats up because of climate change, more precipitation falls on beavers' territories as rain, rather than snow. The rain can then run straight off, flowing quickly into the oceans. The weight of beaver ponds forces water down into the ground, which recharges the aquifers that humans are depleting rapidly.

Some researchers estimate that a beaver pond holds up to 10 times as much water below ground as above it. Beaver ponds also help prevent flooding after heavy rainfall by slowing, spreading, and storing water. During heavy storms, such as Storm Dennis in February 2020, networks of beaver dams in Devon and Cornwall helped keep farm tracks and villages free from floodwater.

Beaver ponds also trap harmful chemicals from fertilisers and prevent them from reaching the sea. Instead, the dams keep these pollutants nearer to their source and they also encourage bacteria to form which help change harmful nitrates in the fertilisers to gases, keeping the sea cleaner. Beaver ponds also prevent carbon from entering the atmosphere when

fragments of rotting wood, which contain carbon fall from the dams to the bottom of the pond. The Beaver population in the Rocky Mountain National Park alone once stored 2.7 million megagrams of carbon (a megagram is 1000 kilograms) equivalent to the amount of carbon trapped in 37,000 acres of living forest.

Unfortunately, in the 1600s, beavers became very popular for their fur, which was made into fashionable, warm and waterproof hats. Not until the 20th century did conservationists start to realise just how important the beavers had been for the environment. In 1948, 76 beavers were packed into a crate and dropped from a plane with a parachute into an area of Idaho, so they could re-colonise the area! Only one of the 76 didn't survive the landing. In 1944, Beavers were reintroduced to Acadia National Park where the area of wetlands nearly doubled by 1997.

Slide 26: Beaver ponds also provide a habitat for many other species from toads and otters to trout and salmon. The deep pools and slow-water channels created by beavers are ideal for salmon fry to rest, feed and shelter from predators. The beaver's dams also provide places for wood ducks and trumpet swans to build nests.

Slide 27 : A plant can also be a keystone species. Mangroves trees, which grow in tropical areas, are vital to coastlines for firming up the shore with their tangles of roots. They have become adapted to growing in saline (salt) water using a complex filtering system and their roots help them stay firm in waves. They prevent the ground from eroding into the sea and at the same time provide shelter and a safe place for many small fish to feed. Mangrove roots also provide habitats for algae, oysters, barnacles and sea sponges.

Slide 28: Sometimes, two or more species have a 'symbiotic' relationship. This means that they both need each other equally in order to survive. When the relationship between two species is mutually beneficial in this way, they are known as 'mutualists'. A good example is the bee. Bees are a keystone species because they are necessary for the survival of so many flowering and fruiting plants. In turn, the plants provide the nectar and pollen, which feed the bees. While the bees search for food, the pollen from the flowers becomes attached to their bodies and is spread from plant to plant, helping to fertilise them. Without bees, many plants would

die out… and with plants at the beginning of our food chains, this would be catastrophic for the rest of us!

SUGGESTED ACTIVITIES

Keystone chains

Children can use what they have learned to imagine what might happen if an animal of their choice was removed from the food chain (use animal cards provided, if children aren't sure which animal to choose). For example: Charles Darwin once suggested that areas with more cats would have more clover flowers. He reasoned that cats eat mice and mice destroy bees' nests. Bees, in turn, pollinate flowers. So if cats ate more mice, the eventual effect would be that more clover would grow! He was one of the first people to understand the ways that species in an ecosystem could be connected. Are there some animals which could be more easily removed from the food chain than others? Which ones?

Beaver pond display

A large display of a beaver pond makes a good starting point for a working wall on keystone species, as there are so many different ways that beavers benefit their ecosystem. Children could work in groups to research some of the different aspects of the system, such as tree growth, flood prevention, salmon breeding etc. and then the whole class could combine their findings on to the display to refer back to.

3. What are some other examples of keystone species?

SUGGESTED STARTER ACTIVITY

Slide 29: Shown are 3 more keystone species. Do the children recognise what they are? Ask children to pick one of the three shown and work together in pairs for a few minutes to see if they can work out why they might be so important to their ecosystems. Are they producers or consumers or both? What might they eat? What might eat them?

TEACHING INPUT

Slide 30: The Southern Sea Otter, sometimes called the California Sea Otter, is another example of a keystone species.

In the 1970s, a marine biologist called James Estes decided to make a study of the differences in the sea floor in places where sea otters had survived compared with those places where they had once been common, but had since been hunted into near extinction for their warm, thick fur. He was amazed by what he found. Islands that had healthy sea otter populations also had healthy forests of sea kelp growing and this provided a home for many other species. Where there were no otters, there was little sea kelp. Instead, the ocean floor was covered in huge sea urchins, and very little else.

Slide 31: In order to live in the sea, otters don't just need the thick fur that made them so attractive to hunters. They don't have any blubber to keep them warm, like seals or whales do, so they need to eat a lot. They especially enjoy eating sea urchins. A sea otter has to eat around 20 to 30 percent of its body weight every day. By eating sea urchins, the otters were preventing them from destroying the kelp forests. Hunting the otters had caused a '**trophic cascade**' - a dramatic effect on all species as a result of a predator at the top of the food chain being removed.

Slide 32: Sea kelp forests don't just provide food for sea urchins. They are home to many species of fish and they even help protect coastlines from strong storm surges. As well as all this, they help keep the carbon dioxide in the sea in balance. Levels of carbon dioxide are rising in the sea as well as in the air, causing the ocean to become more acidic, which is harmful to many species. Sea kelp forests are vital for ocean health, because they are able to absorb billions of kilograms of carbon each year.

Slide 33: The Saguaro Cactus (pronounced suh-WAR-oh) is adapted so precisely to the regional weather cycle of the Sonoran Desert in North America and North Western Mexico, that they are found there and nowhere else on Earth. The temperature has to be just right for them to grow and they need a precise amount of rain during the rainy season, which they then store up during dry spells. They can live for around 200 years.

Slide 34: The saguaro is a keystone species, because it provides food, shelter and protection to hundreds of other species. Birds such as gila woodpeckers create holes in the cactus to make nests, which are later used by other birds. Red tailed hawks and other large birds make their nests in the arms of the cactus and many birds use the arms to rest on or to hunt from.

Slide 35: In an area where very little else grows, the saguaro provides an important food source. Saguaros have hundreds of flowers that bloom from late April to early June. The flowers open at night and close during the afternoon. At night, the nectar from the flowers is food for bats. During the day, birds and honey bees come to feed. The fruits mature in June and early July during the peak of drought, providing one of the only moist food sources for many birds, mammals, and insects during this part of the year.

Slide 36: Parrotfish are rather unusual creatures. They are named for their bright colours, which can vary even within the same family, and for their beak-like mouths. They live in tropical and subtropical waters and can grow up to 4 feet long.

At night, some types of parrotfish secrete a special mucus to cover themselves in a sort of cocoon, like putting on some slimy pyjamas! Scientists think this may be to cover up their scent and keep them safe from predators. Parrotfish are also able to change from female to male and back again several times during their lives, in order to ensure their species' survival!

Slide 37: Parrotfish spend around 90% of their day eating. They nibble away at coral reefs with their beaks, eating all the dead coral and algae that

forms on coral. This keeps the coral clean and helps it - and all the other species that rely on it - stay healthy. Parrotfish also excrete limestone deposits that form the famous white beaches of the Caribbean, a process which is relayed in this catchy song!
https://www.youtube.com/watch?v=k_OyfZO3M58

Slide 38: The Belize Barrier Reef is the second largest network of coral reefs in the world and is home to hundreds of different species. Many more may not even be known about, as only around 10% of the reef has been explored. Parrotfish are a popular food in many areas of the Caribbean, once known as 'kind food'. But overfishing has had a terrible effect on the reefs which they help to protect. A 2006 survey of 140 reefs throughout Belize found that live coral cover had declined from approximately 30% in 1995 to an average of 11%. Another study found that a reef lagoon at Glover's Reef that had once had a healthy 75% coral cover had less than 20% coral cover in 2014 because the algae was taking over. Locals decided it was time to stop fishing parrotfish in order to help the reefs, and their livelihoods, survive.

The island of Barbuda in the eastern Caribbean, has realised the importance of Parrotfish, and has declared them a protected species. It's now illegal to catch, buy, sell or own a parrotfish in Barbuda and 33% of the coastline is protected in special marine reserves to stop people fishing.

Slide 39: Jaguars are the top (apex) predators in their environment and their hunting helps to control the numbers of their prey animals so that none of them become too prevalent, in turn having an effect on their own food sources. They are found in the rainforests of South and Central America and in Mexico and are the only surviving big cat species found in the Americas.

Slide 40: Jaguars have been known to eat pretty much any animals they come across from deer, sloths, peccary and tapirs to crocodiles. A jaguar's jaws can break a crocodile's skull and this big cat is a good swimmer and a stealthy hunter. They eat fish, eggs, turtles and birds. In this way, they actually help to manage areas of their jungle homes, keeping the other species in balance.

Slide 41: As a result of hunting for their pelts and of habitat loss due to human-caused deforestation, the jaguar is now a threatened species, with only an estimated 170 000 left anywhere in the world (compare this with over 900 million dogs...). Without the jaguar to keep the ecosystem balanced, rainforest habitats are at risk of serious and long lasting effects, many of which we may not fully appreciate until it is too late.

SUGGESTED ACTIVITIES

Animal research

Choose one of the keystone species from Lesson 3 and find out as much as possible about them. Where do they live? Are they endangered? What might happen if they were to disappear from their ecosystem? Is there work being done to support this species? Present any findings to the class.

Persuasive writing: Save the species posters and leaflets

Using the research carried out above, children create persuasive texts explaining the importance of their chosen species to convince people to help protect it. Extend this into a debate, for example between a 'save the jaguar' group and a group of local farmers scared that the jaguar will eat all of their cattle.

Ecosystem study

Using the keystone species from lesson three as a starting point, choose one of the following ecosystems for an in depth study as part of a geography topic on a contrasting location to compare with a local ecological area.

- The Belize Barrier Reef
- The Sonoran Desert
- Half Moon Bay (California)
- The Amazon Rainforest (for a link to a teaching pack on rainforests, go to**: https://ypte.org.uk/lesson-plans/rainforests**)

4. Can we use our knowledge about keystone species to help the environment?

SUGGESTED STARTER ACTIVITY

Slide 42: Long ago, predators such as bears and wolves used to roam around the forests in England! Would it be a good thing if they still did? What would the pros and cons of this be? Make a list of these.

TEACHING INPUT

Slide 43: Wolves need a lot of space for their packs to hunt. In Yellowstone Park, in America, there is a lot of open space. Environmentalists wanted to see what would happen if wolves were returned to their natural habitat there. Ferdinand Vandeveer Hayden was an American geologist who is known for his surveying expeditions of the Rocky Mountains in the late 19th century. In 1871, Hayden led a geological survey into the Yellowstone region of northwestern Wyoming. Back in those days, he recorded that wolves roamed the whole area in packs. By the end of the 1920s, there were no more wolves because they had been hunted by humans.

In 1995, ecologists were keen to see what the effect would be of reintroducing grey wolves back into a habitat that had once been theirs. Eight grey wolves were brought from the Jasper National Park in Canada and were placed in acclimatising pens.

Slide 44: One of the reasons for this decision was that in the seventy years since the wolves had gone, elk were starting to overgraze the park. Elk had been one of the main prey animals for the grey wolf, but with no wolves to keep their numbers down, the elk were eating more and more of the trees, shrubs and plants in the park.

Local farmers were very worried that the wolves would leave the park and start hunting their livestock. No one was quite sure whether the wolves would try to head back home to Canada. It was a risky decision.

Slide 45: At first, there were some problems. One of the male wolves did attempt to return to Canada as soon as he was released from the holding pens. His pregnant mate followed. Sadly, the male was killed by a local farmer, who was sent to prison. The female wolf was returned safely to Yellowstone together with her eight pups. By the end of 1996, 31 wolves were relocated to the park. The effects of having wolves roaming the park went further than anyone had predicted. The importance of this keystone species on the **biodiversity** of the park was about to be seen.

Slide 46: Before the wolves were reintroduced to the park, Yellowstone had the largest single elk population in the world. Elk are huge, weighing over 300 kilograms each as adults and they didn't have any serious predators. Grizzly bears live in Yellowstone Park and would be capable of killing an adult elk, but they tend to hunt young elk, which are smaller.

The elk in the park were living longer lives and only tending to die of old age or illness in a long, cold winter. When the wolves came back and started hunting elk, they weren't the only ones who got fed.

Many scavengers were also able to feed on the remains of the elk carcasses that the wolves didn't eat. Grizzly bears, coyotes, eagles and ravens all gathered to share the feast. And because the wolves hunted all year round, the elk carcasses were available all year round, not just in the winter as they had been before. This was especially useful for bears coming out of hibernation in the Spring and looking for a meal. The populations of these scavenger species all increased.

Slide 47: Biologists had been studying the trees in Yellowstone National Park and were confused about why the Aspen trees were declining. Aspen grow quickly and are able to re-sprout from their underground root networks. Even after fires and floods, their seeds are usually quick to produce new saplings.

By looking closely at aerial photographs and by investigating tree rings, the scientists were able to discover that the Aspen had started to decline since the 1920s... the same time that wolves had disappeared from the park.

With the wolves gone, the elk had been able to remain in one place for a long period, eating all the young aspen saplings. The same was happening

to willow and to shrubs that produced berries. As a result, those creatures that depended on these trees and berries were also disappearing.

As the wolves were reintroduced, the elk were forced to roam more widely and the trees had a chance to recover.

Slide 48: As the trees began to recover, this, in turn, had an effect on other species. Beavers depend on willow as a food source during the winter. With increasing numbers of willow trees surviving in the park, the Beaver population was able to grow. In 1995, there was only one remaining beaver colony in Yellowstone National Park, but now there are nine and as we have seen, beavers are also a keystone species that brings benefits so that numerous others can flourish!

Slide 49: In many myths from the Native American people and also in Norse legends, wise ravens and wolves act together to help each other. These stories were probably based in truth. When wolves are present, there will be ravens, as the birds know that wolves mean food for them. Ravens may even help wolves in return by flying in circles in the air above groups of prey animals, helping the wolves to hunt so that they can all benefit from the resulting food.

SUGGESTED ACTIVITIES

Local species study

How many different species of plants can be found in your school grounds or garden? Investigate what the different plants are and try to find out what sorts of other creatures they attract. How could you make small changes to the environment in order to encourage more species? (You may be able to plant 'bee friendly' plants such as lavender, or be an ecosystem engineer by building a bug hotel!)

Create an ecosystem

If there is space to do so in the school grounds, investigate an area where you might be able to set up a meadow or pond. This can be a small container sunk into some ground, it needn't be an elaborate build - though this would be a great opportunity to set one up! Investigate the existing plants and animals in the area, such as grasses or insects. Note down as

many different species as possible. Whilst setting up the nature area, be sure to note down any species that you introduce to the area. As the new space becomes established, keep checking to see whether any other plants or animals are now making use of the ecosystem you've created. What has brought them there?

Keystone myths and legends

Investigate traditional myths and legends about ravens and wolves. Are some of these based in fact? Children could choose their own keystone species and make up a myth about it and the ways in which it is important to other species.

We value your feedback!

Let us know what you thought of this lesson plan by completing this Google Form https://forms.gle/cGAwi9AWXfSZgrYa9. **Thank you!**