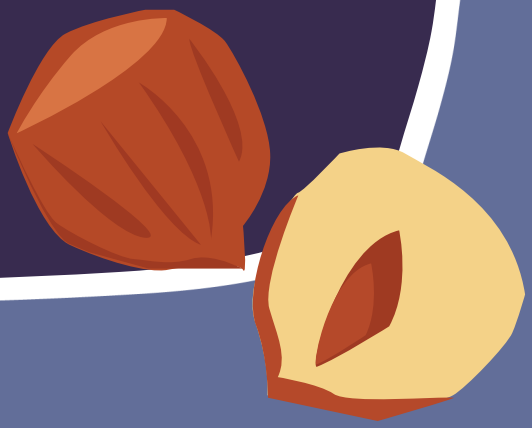
Winchester Science Centre
By Wonderseekers

Habitat Heroes

Pre-visit resources for KS3



Habitat Heroes KS3 Pre-visit Activities

These activities are designed to be completed before you visit for your habitat heroes workshop. We recommend working through the activities from 1 to 3 but you are welcome to pick and choose depending on your group's prior knowledge.

Through these activities we will be exploring the importance of habitats to animal species and the relationship between them. We will be encouraging the exploration of the your school grounds to look for signs of habitats. We will then explore the idea of an ecosystem and how all the animals are connected via the food web. We will then see how different factors, such as human activity can influence an ecosystem.

Teacher Guide:

Learning Objectives:

- To understand why habitat are important to different species.
- To explore the relationship between producers and consumers in food chains.
- To explore how the relationship between living things and their environment come together to form ecosystems.

Key Science:

Through these activities we will be exploring the importance of habitats to animal species and the relationship between them. Habitats provide the shelter, food, water and space for different creatures providing all the different needs a species will have. Animal species will have similar needs, but often use different resources to meet these needs. This leads to predator and prey relations between species, which we can organise into food chains. Food chains help us identify the movement of energy in a habitat from the sun, to plants (which are producers) and then onto animal species (the consumers).

Both the habitats and the different food chains form the foundation of the Ecosystem. The ecosystem is the community of all the living and non-living things in an area. This includes all the plants, animals, and the natural features like water, rocks and soil. In the ecosystem the food chains come together and interweave, forming a food web which links all the animal species together. As you move up the food chain, energy flow follows it. However, not all energy is consumed - lots of it is lost as heat until we reach the very top. This is the apex predator – the top of the food chain. These animals aren't consumed by anything else, but when they die the energy is returned to the ecosystem through decomposers like bacteria or fungi.

Curriculum links:

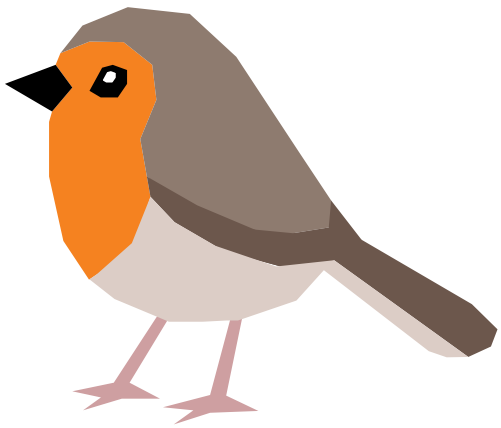
Interactions and interdependencies.

Relationships in an ecosystem.

- The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops.
- The importance of plant reproduction through insect pollination in human food security.
- How organisms affect, and are affected by, their environment, including the accumulation of toxic materials.

Key Definitions:

Habitat – The place where something lives. Its natural home which gives it everything it needs. For a plant, that's light, air, water, soil. For an animal its shelter, water, food, space.
Biodiversity – The mix of living things in an area. High biodiversity means there are lots of different kinds of living things.
Ecosystem – Living things and the environment where they live.
Human spaces – Areas made by humans for humans, often with little thought for wildlife.
Season – There are four seasons which have different weather and light patterns: spring (warming up), summer (warm and dry, lighter), autumn (cooling down), winter (cold, darker).
Herbivore – An animal which eats only plants.
Carnivore – And animal which eats only other animals.
Omnivore – An animal which eats plants and animals.
Producer – Something which makes its own food from the sun's energy, e.g. a plant.
Consumer – Something that eats something else to survive – these can be primary or
Predator – Something which eats other animals.
Prey – Something eaten by animals.
Food chain – A series of living things, each depending on the next for food, e.g. plant, caterpillar, bird.
Physical environment – The soil, rocks, water, weather, air, human structures, etc.



Activity 1: Shipwreck Survival

Overview

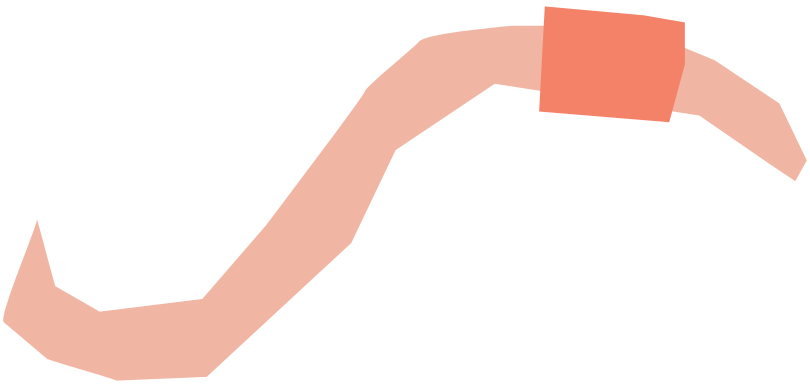
This activity recaps the concept of a habitat by exploring the things that humans need to be able to survive.

You will need

- Paper.
- Pencils.
- Colouring pens/ pencils.

Instructions

1. Oh no, you have been shipwrecked on an island in the middle of the ocean!
2. Make a list of all the things that will be essential to be able to survive on the island, can you put them in priority order?
3. Is there anything that would make life on the island more comfortable? Think about would make your life better if you were living there for a long time.
4. Draw your island and label all the features.
5. Has everyone drawn the same thing? Compare what is the same on your island. These things are the essential things needed for a human to survive, things such as shelter, air, water, food, nutrients and companionship.
6. Plants and animals also need some key things to survive. All of these things are found in their habitats.



Activity 2: Microhabitat Survey

Overview

Complete a survey around your school grounds to see how many different microhabitats you can find. A microhabitat is a small, specific areas within a larger habitat that offers unique conditions and resources for living things.

You will need

- Printed habitat survey sheets (on page 8).
- Pens.
- Clipboards.

Instructions

1. Discuss with the group the meaning of the term microhabitat and think of some examples.
2. Hand out the habitat evidence sheets to the students.
3. Explain the boundaries for the activity so the students know where they are allowed to go.
4. Within each microhabitat found consider what essential resources are available. Is there a source of water, food or somewhere to shelter?
5. Ask the students to note if any animals are found in the area they are looking.
6. Feedback with the group at the end to find out about the diversity of microhabitats across the school site. If you have a map of the school grounds the data could be shown on it to highlight the biodiversity of the site.

Take it further

Come up with ways to increase the biodiversity of your school grounds, make a small bug hotel or another microhabitat.

Activity 3: Food chain tangle

Overview

This game shows how energy is transferred across a food web and how species can be interdependent on each other. The terms producer and consumer are used to explain the game, if this topic has not been covered before it may be worth explaining this terms as the game is played.

You will need

- Printed game cards (pages 9-14).

Instructions

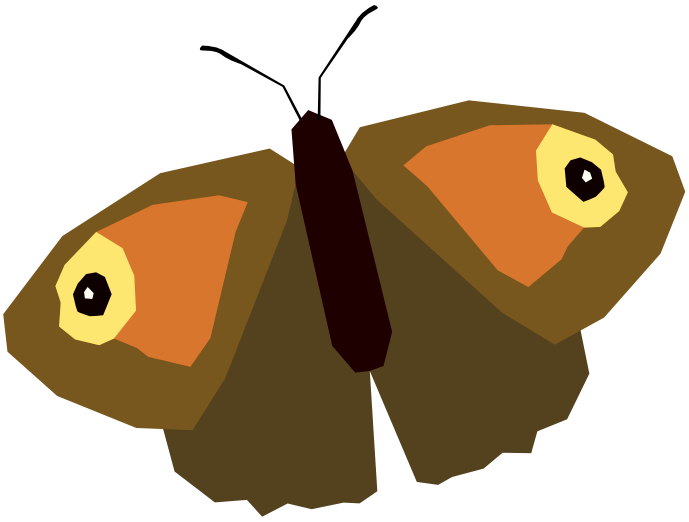
1. Each member of the group is given a card from the list below, you can have multiple of each except from the sun. To make it easier for the students the cards can also be made into headbands so that each player can have their hands free.
2. The sun starts off with multiple balls of string, they throw one ball of string to a producer whilst keeping hold of the end. Explain that plants/ producers use energy from the sun to grow.
3. The producer then throws the ball on to a consumer they think will eat them. Explain that the energy from the plant/ producer is used by the consumer.
4. The ball is then thrown to someone else that the primary consumer thinks will eat them. Explain that the energy is transferred again.
5. Continue throwing the ball until an apex predator is reached.
6. Play the game again, starting from the sun using a new ball of string. Repeat until everyone is involved.
7. The web created may look like a mess but it is a brilliant way of showing an ecosystem, lots of species are dependent on each other.

Next consider how different factors affect the food web.

1. For example:
    - There is a drought.
    - Pesticides are sprayed over food crops.
    - Pollutants from a local landfill are washed over farmland in heavy rain.
    - Fertilisers from farmland are washed into local waterways.
2. Each student that is affected by the factor should start to shake the string they are holding up and down and explain how they would be affected.
3. If other students feel the string shaking, they should also shake the string up and down and explain how they are affected. Continue until nearly all of the web is shaking.
4. This shows how if one part of an ecosystem is changed then the whole ecosystem is affected, even someone isn't actively shaking the web they will still be able to feel the vibrations.

Take it further:

What about humans? Where do we fit into a food web? Do we have one of our own?



Microhabitat Survey

Type of microhabitat	Location	Features of habitat/ animals found here

Cards for Activity 3: Food chain tangle

Bat

Squirrel

Dragonfly

Bee

Rabbit

Snail

Slug

Worm

Tadpole

Moth

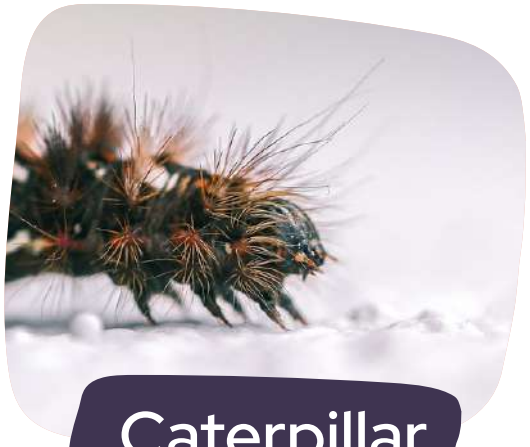
Pondweed

Buttercups

Fish

Sun

Buzzard



Caterpillar

Fox

Hedgehog

Basil

Mouse

Stinging Nettles

Corn

Daisies

Frog

Grass

Algae

Ants

Badger

Mole

Cabbages

Take it futher - Human food chain