Complementary Activity

Environmental Games

These games have been designed to help illustrate processes and facts of the natural world. They complement classroom and other studies by aiding the understanding and memorisation of topics.

FOOD CHAIN GAME (related to hedgerows)

Explanation of Food Chains

Whilst looking at the hedgerow discuss: Living things do not exist in isolation, they all rely on other factors and on other living things to survive. A group of living things that are inter-dependent make up an ECOSYSTEM. Food chains within ecosystems are made up of living things from three different groups:

PRODUCERS – these are the plants that use the energy in sunlight to create food in order to grow. This process is called *Photosynthesis.* Some examples in the hedgerow are hawthorn leaves and berries, hazel leaves and nuts and plants growing in the hedge bottom.

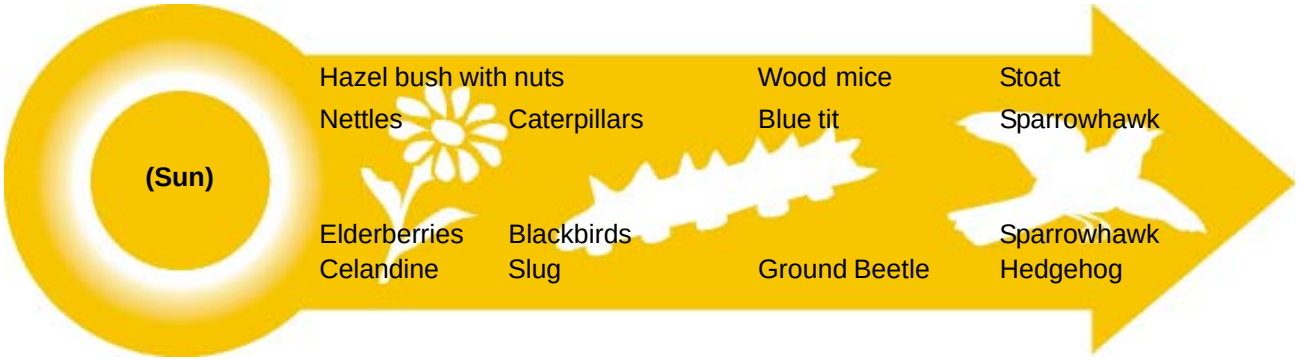
CONSUMERS – these animals consume to gain energy for growth and development. There are three consumer groups:

Primary consumers	animals that eat plants and are called *herbivores.* Examples – rabbits, woodmice, chaffinch, caterpillars.
Secondary consumers	animals that eat primary consumers and are called *carnivores/ predators.* Examples – robins and blue tits eat caterpillars, foxes eat rabbits, stoats eat woodmice.
Tertiary consumers	these are animals that eat secondary consumers also called *carnivores/predators.* Example – sparrowhawks eat small birds like blue tits.

(Note: some animals eat plants *and* animals and they are called *omnivores*. For example – badgers eat plant roots and shoots but also grubs and worms.)

DECOMPOSERS – fungi, bacteria and some animals such as ground beetles and worms break down dead plant and animal matter and release the nutrients back into the earth.

Examples of hedgerow food chains:



The Game

Give the children an identity e.g. wood mouse, ladybird, sparrowhawk and so on. Ensure there are very few top predators. For example, a class of 30 children might be split:

3 predators such as fox, stoat, sparrowhawk
7 secondary consumers such as blue tits and beetles and so on
9 primary consumers such as aphids, blackbirds, caterpillars
11 producers - hedgerow plants

Once the children have an identity get them to find other members in their grouping and decide whether they are producers or consumers, primary, secondary, or tertiary. As a group they need to devise an action they can do when running round to distinguish them from the others. For example, producers are plants so could hold arms out like branches or leaves and so on. Let each group know each other's action.

Instruct them that, on your command, they must run out into the field and find food. When a consumer catches its 'food' it must keep hold of it (chain forms hand to hand. Instruct them to run carefully as they must keep hold of their 'food'). See what food chains are produced, how long and correct/discuss.

After a few sessions of making different food chains, gather the group and reverse the numbers i.e. a larger number of top predators than producers and so on. Play the game again and see what happens. Try removing the primary producers from the game to see what happens.

Explain how food chains are balanced. Give an example of when a food chain can be disrupted like with domestic cats in gardens or humans overfishing one species. At this point you could refer to SUSTAINABILITY and how humans need to take responsibility for their behaviour and understand how to manage resources in a sustainable way (see "Farming & Sustainability" in the Northsidehead Farm section). You could also bring up the subject of hedgerow management to maximise variety within the habitat and maintain food chains. Compare the diverse hedgerow with intensive, fast growing single species hedges. What are the differences?

The game can be adapted to different habitats e.g. meadows, woodland, ponds but in all cases space is needed to run around.

CAMERA GAME

This game helps to focus attention and can be used in different habitats to highlight features.

In pairs, the children decide who will pretend to be the "camera" and who will pretend to be "the photographer" first. The camera must keep their shutter (eyes) closed until the photographer says "Open!"

The photographer guides the camera until they find an interesting photographic composition. Remind them to describe where they are moving to the camera and to step up or down etc. to avoid accidents.

The photographer points the camera's lens (head) at the subject. The picture is taken by the photographer tapping the camera on the shoulder and saying "Open". He/she taps again to make the camera close the shutter (eyes). This should be a short delay of about 5 seconds when the camera opens their eyes, sees what is in front of them and closes them again. It is important to keep their eyes shut at all other times to maximise the effect.

The photographers should be encouraged to really think about the composition of the photo. It may be up close to a flower head or looking up at the canopy of a tree. The photographer may tell the camera which lens to use. For example, for the flower a close-up lens or for a horizon view a wide angle lens. Explain that the point of the game is to photograph the "habitat" (otherwise you might end up with a photo of a gate or fence etc.

The image taken by the camera can then be "developed" by drawing it on a piece of card. Descriptive words which could be used later for poetry etc. could then be written on the back of the card.

This game can be used to illustrate things in the children's immediate school environment and the effects that people have on it.

BE A TREE GAME

This game will encourage the children to work together whilst helping to explain the biology of trees.

Find a space large enough for the whole group (if the group is very large it should be split into two groups).

Describe the parts of a tree in sequence and pick children from the group to act as each part.

1. The HEARTWOOD makes the inner core of the tree and gives it strength to stand tall. This wood is no longer living as its 'tubes' are blocked with pitch and resin. The children need to reach for the sky and stand up tall and straight.
2. Next, the TAP ROOT is put in place. Ask the children pretending to be the tap root to sit on the ground, facing outwards, around the base of the heartwood. The taproot goes deep into the ground and anchors the tree firmly in the soil.
3. The LATERAL ROOTS are now added. The children playing this part need to lie on the ground with their heads away from the tree. Explain that there are a great many of these roots and that they have lots of tiny hairs through which they soak up the water and nutrients. The children can depict the sucking action of the lateral roots by making "slurping" noises.
4. Now to add the rest of the trunk, SAPWOOD (or XYLEM) surrounds the heartwood. If you have enough children, try and get them all the way round the heartwood. They need to face inwards and hold hands. Explain how the xylem draws the water up from the roots and takes it to the leaves. There are no moving parts yet it is the most effective pump in the world, sucking up gallons of water each day. Get the children to show this action by moving their arms up and down.
5. The CAMBIUM LAYER (or PHLOEM) is then positioned around the xylem. Children representing this need to face inwards and again be stood all the way round the tree trunk. The phloem carries food made by the cells in the leaves down to the roots to be stored. To make the food they need to wave their hands in the air to act like leaves and make a "whooo" sound as they crouch to show the food going down to the roots.
6. The remaining children will pretend to be the bark. This is the hardened outer surface of the tree, which acts as a barrier to harmful insects, cold weather and other threats. Therefore, these children need to face out from the tree and put their arms out straight and shout, "keep out".

Work through the actions of the parts one by one to make sure everyone knows their role and, when everyone is in position, say "Go!" get them to do it simultaneously!

Lime Tree Farm

Bluebell understorey in the woodland on the farm.

"IN THE POND, ON THE BANK" GAME

Resources needed: Rope/coloured string (tape to secure on floor if indoors).

This game needs some space to play, ideally outdoors. Mark a circle on the ground with string, rope, large enough to fit the whole group in with ease.
The string/rope represents the edge of the pond.

Using an understanding of ponds and the wildlife associated with them call out the names of animals, birds and insects. The children must decide whether they should be:

- **in the pond**
- **on the bank**
- or **both** (with one leg either side of line).

Explain the answers.

Some examples:

- Frog - **both** - they usually hibernate on land under hedges and stones etc. but spend a lot of time in and around the pond.
- Tadpole - **pond** - they have gills to breathe so can only live in water.
- Newt - **both** - they hibernate on land under hedges and stones etc. but spend a lot of time in and around the pond.
- Diving Beetle - **pond** - feed on insect larvae and other animals within the pond.
- Dragonfly - **bank** - as an adult they fly above the pond hunting small flying insects.
- Dragonfly Nymph - **pond** - this stage of their life is spent in the water hunting for other insect larvae etc.
- Water Boatman - **pond** - swim in the water.
- Leech - **pond** - in the mud at the bottom of the pond.
- Heron - **both** - bird that nests in trees but feeds on amphibians and fish in ponds by standing very still in the water or on the bank.
- Swallow - **bank** - flies above the ponds feeding on the insects.
- Fox - **bank -** drinks from the pond, may catch ducks living on it.
- Caddis Fly Larva - **pond** - live in the water, feeding on plants or other animals in the pond.
- Pond Snail - **pond** - feed on the algae in the water.

BAT & MOTH GAME (to illustrate bats' adaptation)

Resources needed: a blindfold.

This game needs some space to play and is ideal for outdoors.
The group stands in a large circle.

Explain to the children that bats have very poor eyesight and they hunt at night so their hearing has adapted and become very, very good. They use eco-location to find their prey: a sound is emitted in waves and these bounce back off the things they hit. Bats are very good at listening for these echoes and can pinpoint where their prey is.

Ask for a volunteer to be the "bat" to put on the blindfold and stand in the centre of the circle.

Now choose a number of volunteer "moths" (one to four depending on group size), who also go into the circle, but not blindfolded. Close the gaps in the outer circle.

The bat must shout out "bat!" and in response the moths should echo back by saying "moth".
The idea is for the bat to locate the moths by listening to their response.

They should learn that the more they say, "bat", to get a response, the easier it is to locate their prey.

Make sure the moths always reply clearly to the bat's calls.

Take it in turns to be the bat and moths.