

SUMMER SURPRISES

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INTRODUCTION



Height of the season

Summer is a time when everything is seen to be ripening. The early spring flowers are setting seeds and summer flowers are appearing. Tree canopies are full and there are more minibeasts, birds, flowers and mammals visible. There are many hands-on activities based around minibeast hunting and so the following pages indicate some of these, together with ideas for follow up work ranging from creative writing and games. Encourage the children to look for these characteristic sights of summer.

JUNE

Yorkshire Fog

Grass family, flowers from June to September. **SG p21**

Timothy Grass

Little 'spikelets' go all the way round the stem making it look like a cat's tail. **SG p21**

Elder

Gently scented white-cream flowers – the flowers and the berries can be used to make cordial or wine.

SG p22

Rosebay Willowherb

Eaten by the caterpillars of Elephant Hawkmoths – large and brown with enormous spots that look like eyes. **SG p5,18**

JULY

Red Admiral Butterfly

Caterpillars feed on nettles but the adults are often spotted on rotting fruit. Migrates between Europe, North Africa and UK.

SG p5

Earwig

Earwigs have a pair of rear pincers and can be seen eating leaves, flowers and rotting fruit. **SG p3**

Common Wasp

Wasps can be seen collecting wood, which they chew, to make their nests.

Moorhen with sooty black chicks

Moorhens are water birds, with long spindly legs and red beaks, (Coots have white beaks.) **SG p10**

AUGUST

Brown Hawker Dragonfly

Large dragonfly with yellowish brown wings – seen catching insects as it flies. **SG p4**

Kingfisher

Watch out for a brilliant blue flash as it flies up and down the river. The 'nest' is a tunnel excavated in the river bank. **SG p12**

Grass Snake

Completely harmless. It is up to 1 m long and its colour ranges from green to brown, but always with a yellow triangle on the neck.

SG p9

Purple Loosestrife

Magenta flowers with 5 to 7 petals. A single plant can produce up to 3 million seeds each year! **SG p19**

RESOURCES

www-saps.plantsci.cam.ac.uk This is an excellent site including a thorough project across the curriculum, based on the very common dandelion so it is easily manageable for the whole class.



ALL ABOUT BEES AND WASPS

Bees are very important to us because by visiting flowers to feed on nectar and pollen they are the main way plants become pollinated. Bees have furry bodies which get covered in pollen grains when they land on a flower to feed. Some flowers are designed to



make this happen as the bee moves around. At the next flower, some of this pollen will fall off onto the stigma (see PLANT REVISION in SPRING HAS SPRUNG!) to fertilise the flower, and more new pollen will attach. Pollination is very important to humans because one-third of our food comes from plants that depend on pollination. There are around 300 different species of bees in Britain, in three groups – bumble, solitary and honey bees.

Bumblebees are the biggest bees we have in this country. They are quite furry and our 20 or so different kinds have varying patterns of stripes. The basic colour is black or brown with wide stripes of yellow or white. A bumblebee nest is like a bird's nest, found in compost heaps, under garden sheds, in mouse holes and in tussocks of grass.

Solitary bees work on their own, though they may all choose the same part of your garden or school grounds to live in. Each

female makes a row of cells in a hole and provides the eggs she lays with enough pollen for the larvae to eat and grow to adulthood. Most solitary bees cannot sting. (See MAKE A BEE HOTEL in this section.)

Honey bees are useful to humans as they produce the honey we like to eat. Beekeepers can also use wax and propolis – a waxy substance collected by bees from buds and used by the bees, like cement – to make candles, polishes, creams and medicinal products.

The Queen bee keeps the hive together. Worker bees feed a larva with royal jelly to create one queen in each hive. Following her mating flight, her main purpose is to lay eggs – up to 2,000 every day – while the workers rear the bees. In the peak of the summer a healthy colony can have up to 60,000 bees. A queen lives from four to six years, but is often forced to swarm after three when the workers sense she is not at her best. Approximately half of the hive will leave with the old queen, and they will establish a new colony elsewhere. The remaining worker bees will raise a new queen. **(See over page.)**

ALL ABOUT BEES AND WASPS continued



Worker bees are all female and make up most of the bees in a hive. The youngest construct the comb, rear the brood, tend the queen and drones, clean, control the temperature (by beating their wings) and defend the hive. Older workers forage outside to gather nectar, pollen, water and sticky plant resins (propolis) used in hive construction. Workers live about six weeks because they are soon exhausted. However, those born in the autumn can survive until the following spring.

Drone bees are male and have no sting. There are only a few hundred in the hive. Their sole function is to mate with a new queen. They are bigger than the workers and have bigger eyes. Drones live for about eight weeks. At the end of the season they are considered unnecessary and driven out!

Wasps are mostly predators and meat eaters and do not store honey. They make their nests from paper and colonies last only a season. The basic colour for wasps is black and yellow stripes. We have about eight kinds of wasps in Britain.

Hornets are particularly big wasps. They live in similar paper nests and eat other insects. The red tint is typical of a hornet compared with smaller wasps. Though they look and sound fearsome, hornets are not really any more dangerous than other wasps and are perhaps even a bit less aggressive.

RESOURCES

www.britishbee.org.uk/bees4kids/index.php Produced by the British Beekeepers Association, the folder 'Bees in the Curriculum' has a mass of information about bees, together with worksheets and the appropriate links to the curriculum.

BUILD A BEE HOTEL

AIM

To increase nesting opportunities for an interesting group of harmless insects.

Time needed

30 minutes

Age group

6 years +
(adult help required)

Location

Outdoors

What you will need

- Garden twine or string or wire
- Any hollow plant stems such as reeds or bamboo canes.
- Alternatively, a block of wood and a drill

Safety first

Don't worry; the children will not be stung by a solitary bee. Some species do not have a sting and the others will only sting in self-defence.

Not all bees live together in colonies. Solitary bees live alone but they are finding it increasingly difficult to find suitable places to make nests holes in which to rear their young. They like to use hollow reeds or twigs, holes in wood or, most commonly, tunnels in the ground. The female creates a compartment called a 'cell', lays an egg, leaves some food and then seals it off. You can help the solitary bees find suitable homes by making a bee hotel.

What to do

Cut the stems into 10-20 cm lengths. Different widths will be used by different species. Now bundle them together so the open ends all face the same way. Use the twine, string or wire to tie the tubes tightly together.



Leave a long end so the 'hotel' can be secured in place. Choose a location that is protected from the rain on a south or east-facing wall, which receives sun. Try putting the hotels in different places such as a shelf in a shed, in a rockery or on a fence.

Another way to make a hotel is to drill deep holes of various diameters into a block of untreated wood and place this in a similar position in the school grounds or garden.

You will know if your hotel is being used as the ends of tubes will be sealed with leaves or mud where the bees have 'checked in' to lay eggs. Other minibeasts, such as ladybirds and lacewings, might also look for a safe place to shelter if the hotel has vacancies. But watch out for wasp larvae as they will feed on the bee grubs. See how busy your hotels get in the summer season!

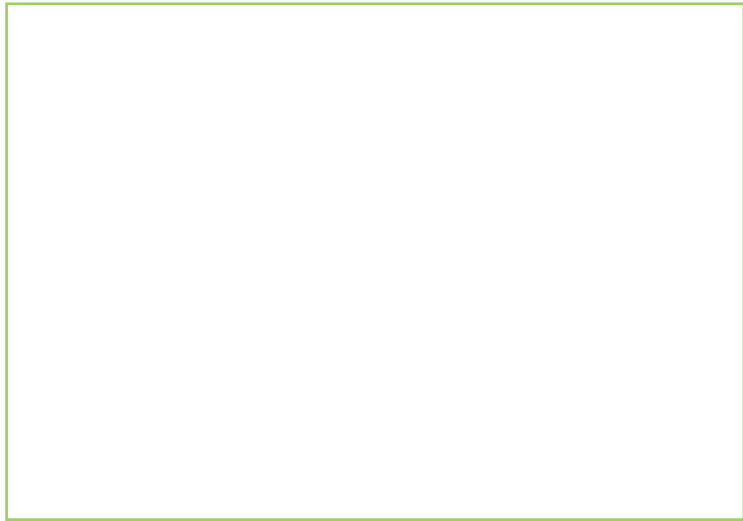
THIS IS MY MINIBEAST!

My name is Date

My minibeast looks like
this 








Its colour is
.....

It is about this big
(draw a circle/rectangle)







✓ Tick the right boxes:

It has

- segments 
- 1 pair of wings 
- 2 pairs of wings 
- no wings 
- antennae 
- a shell 
- a hard wing case 

It has

- no legs 
- 6 legs 
- 8 legs 
- > 8 legs 

It moves

- quickly 
- slowly 

I found my minibeast in/on















- land places {
 - a tree
 - grass/flower
 - log/stone
- watery places {
 - surface
 - weed
 - mud

My minibeast is a

It eats

It is eaten by

MINIBEAST KEY


 Does your minibeast have legs?	YES? Go to 4	NO? Go to 2
 Does your minibeast have a shell?	YES? Snail	NO? Go to 3
 Is your minibeast's body clearly divided into rings or segments?	YES? Worm	NO? Slug
 Does your minibeast have more than four pairs of legs?	YES? Go to 5	NO? Go to 7
 Does your minibeast have more than seven pairs of legs?	YES? Go to 6	NO? Woodlouse
 Does your minibeast have one or two pairs of legs on each body segment?	One? Centipede	Two? Millipede
 Does your minibeast have three or four pairs of legs?	Three? Go to 8	Four? Spider
 Does your minibeast have wings?	YES? Go to 10	NO? Go to 9
 Does your minibeast have more than three body segments?	YES? Caterpillar	NO? Aphid
 Does your minibeast have one or two pairs of wings? (Look closely, there may be a second pair of wings hidden.)	One? Fly	Two? Go to 11
 Are the wings hidden?	YES? Go to 12	NO? Go to 13
 Does the minibeast have spots on its back?	YES? Ladybird	NO? Beetle
 Are the wings transparent?	YES? Go to 14	NO? Go to 15
 Can you see three body segments?	YES? Wasp	NO? Bee
 Does your minibeast have antennae with a ball at the end?	YES? Butterfly	NO? Moth

COMPARING MINIBEASTS

Now you have had chance to look for some minibeasts and identify them, try to complete the table below. There is space for eight minibeasts.

Name	How many wings?	How many body parts?	How many legs?	Is it an insect?

Choose one of the minibeasts from your list above and make a detailed drawing in the box.



Now add labels for **head**, **thorax**, **abdomen**, **wing** and **legs** and try to answer the questions

How many insects are in your table?

.....

What makes a minibeast an insect?

.....
.....

Are any similar? How?

.....
.....
.....

What else do your results tell you?

.....
.....
.....
.....

CREATIVE WRITING

AIM

To explore and describe habitats from a minibeast's point of view

Time needed

30 minutes plus class room time to complete the writing

Age group

6 years +
(with adult supervision)

Location

Outdoors

What you will need

- 1 piece of string per child 1-2 m in length
- Carrier bags to lie on if wet
- Paper, clipboards and pencils
- A few copies of the Minibeast statements (see over)
- Small mirrors (optional)

Preparation

Photocopy the Minibeast statements (see over)

Safety first

Warn the children about brambles and nettles

What to do

Ask the children to choose a minibeast; either an ant, a butterfly or a centipede. Then group together the children who have chosen the same minibeast. Show the children the page of statements about the three minibeasts and allow them to decide which statements refer to their creature. This will start them thinking about the life-style of their chosen minibeast (some statements may refer to more than one minibeast).

Working individually or in pairs the children need to choose an area they think their minibeast would live. For ants and centipedes lay down a metre length of string to show a route their creature may walk. For butterflies they will need a 2 m length as butterflies fly faster than ants or centipedes walk (they may go beyond this if they have finished long before their friends).

Shrink them down!

Let the children know they now have to shrink to the size of their chosen creature! They can hold hands, shut their eyes and count to three. When they open their eyes they have shrunk and must see things differently. They must follow the route they have just laid out, pretending they are the minibeast and seeing the world from the minibeast's point of view. They need to remember the statements about their minibeast to ensure they move and act in the same way. Those following a centipede's or ant's route should lie on their tummies so their eyes are at the right level! The butterflies can fly above their string and change heights, alight on a flower, fly over or around things. Tiny pebbles will become huge boulders, a puff of wind will become major turbulence! The children can use the small mirrors to hold under logs or against cracks and crevices so they can see from a completely different perspective.

As they go the children should make notes of their journey which will lead to the writing of a story. (Younger children can just call out words or phrases for the leader to jot down.) If you have time the children can write up their story while still outside. Alternatively this can be a great follow up activity back at school.

MINIBEAST STATEMENTS

I feel things with my antennae

I like the sun

I like damp places

I like dark places

I'm looking for other animals to eat

I have to be fast

I collect lots of things; flowers, seeds, bits of dead animal

I like to stay under things and out of sight

I stay by myself

I like to be with other ants

I need to stay away from spiders' webs

Birds might eat me

I like to crawl around under logs

I like to visit flowers

I like to run over things

I do not like bright, sunny areas

I have to be careful when it is windy

I prefer to stay on the ground

I am happy to explore up a tree

THE FOOD-CHAIN GAME

AIM

- **To understand that the Sun is the source of all energy and that plants are the only living things that can turn the Sun's energy in food.**
- **To understand that living things are linked and depend on each other.**
- **To review the names of creatures seen during pond dipping, what they eat and what they are eaten by.**

Time needed

5-10 minutes

Age group

Age 6-8 (minimum 5 children)

Location

Outdoors

What you will need

- Index cards or pieces of paper or sticky labels
- Wide-tipped pen
- Tape

Preparation

Use the pen to label each card as follows: Water Boatman; Tadpoles; Water Fleas; Very Small Plants; Sun

Hand children the cards already taped to press on their chest

What to do

1. Arrange the children so they can see and hear. Some will be selected and will need to stand facing the others.
2. Talk to the children and try to work with the answers they give. The following is an example of how the activity might develop.

'All the creatures we found in the pond are connected. One of the main ways they are connected is by who eats who.'

'Who found a Water Boatman?'

The child who answers receives this card and tapes it on.

'What does he eat?'

The child who says 'Tadpoles!' gets this card and tapes it on.

'Did we see any Tadpoles today? Why not?'

(If necessary) **'Who has kept Tadpoles? What do they eat?'**

The child who says 'Water Fleas!' gets this card and tapes it on.

'And who can remember what Water Fleas eat?'

The child who says 'Very Small Plants!' gets this card and tapes it on.

'What do plants eat?'

(You are prompting the answers Water and Soil)

'If you put a plant in a dark cupboard with Water and Soil would it grow? What else does it need?'

The child who says 'Sun!' gets this card and tapes it on.

'Do you realise that plants can 'eat' the Sun?'

The process by which plants turn sunlight into food is called photosynthesis. Without sunlight and plants none of us could live. **(See over page.)**

THE FOOD-CHAIN GAME continued

3. Arrange the children with cards into a straight line in order of who eats who, as follows



Now ask the following questions:

'Where does all our energy come from?'

Answer 'Sun!'

'Who can turn sunlight into food?'

Answer: 'Very Small Plants!'

'Who eats the plants?'

Answer: 'Water Fleas!'

Now ask, **'What happens if we take away the Sun?'**

Answer: 'No plants would grow and all animals would die.'

'What happens if we take away all the plants to make the pond look tidier?'

Answer: 'There would be nothing for the plant-eaters to eat and eventually all the other creatures would die.'

'What happens if we take away the Tadpoles which are eating the Water Fleas?'

Answer: 'There would be many more Water fleas in the pond and the Water Boatmen would have to find something else to eat such as the Water Fleas or small fish.'

Tell the children that they have just made a food chain and then ask:

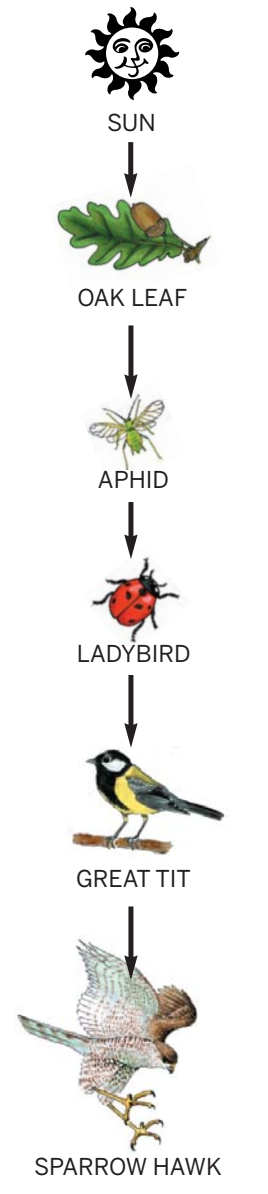
'But you don't just eat beef burgers do you? Well the Water Boatman or the Tadpole eats lots of different things as well. That is why this chain is not real. Animals and plants are not connected by a chain but by a web.'

Can they think of anything else in a pond that would appear in a food web?

Linked activities

Now follow with THE FOOD-WEB GAME which is more representative of how food chains work in a pond.

The FOOD-CHAIN GAME can be adapted to suit any habitat. For example an Oak tree food chain may be:



THE FOOD-WEB GAME

AIM

- To follow on from **THE FOOD CHAIN GAME** to show that the connections between living things can be complicated.
- To show that changes in a food web can cause unpredictable results.
- To review the names of creatures seen during pond-dipping, or other minibeast study, and what they eat or are eaten by.

Time needed

10 minutes

Age group

All age groups. This is a good follow-up for KS2 students (minimum of 10 students)

Location

Indoors or outdoors

What you will need

- Index cards or pieces of paper
- Tape
- Wide-tipped pen
- Lengths of medium thick rope approx 1 m long or skipping ropes

Preparation

Hand children the cards already taped to press on their chest

Safety first

Do not allow students to wrap rope around their hands. No-one is to pull rope until they are told to do so.

What to do

Arrange the children in a circle and ask children without labels (see THE FOOD-CHAIN GAME) to tell you the names of plants they've seen while doing the previous game, or while they have been on the Island. Write the names of the plants on labels and stick them on the children who named the plants. Be positive and work with the information the children give you. Then ask for names of animals which eat plants (herbivores), animals which eat the animals which eat plants (carnivores), or predators and animals which eat the animals which eat the plants (super predators). If you are working with a group of 11 children the ideal balance is 1 sun (see later), 4 plants, 3 herbivores, 2 predators, 1 super predator.

Now ask the following questions:

'Where does all our energy come from?' 'Sun!'

Give Sun the end of several pieces of rope. '

'And who turns sunlight into energy?'

Connect plants to the Sun. The plants will need to hold several pieces of rope now to connect to animals which eat them. Remember each plant will be eaten by several animals/insects

'And who eats plants?'

Connect plant and plant-eater with rope.

Continue the questioning

'And who eats this insect/animal?' and so on, until all children are part of the web at least once.

'This is the web. Can you see it? and each one of you is an important part of the web.' For instance,

'What if I take away the sun? Who will be affected?'

Ask children to hold all the ends of the rope tightly and make sure the rope is taut from one child to another. Ask 'Sun' to give the rope a tug. **(See over page.)**

THE FOOD-WEB GAME continued

'Who felt the tug? Why?' Because without sunlight plants can't grow.

'Now all those who felt the tug, tug the rope. Who felt the tug?' Take one or two connections and discuss why they would be affected. 'Because without plants, plant-eaters can't live.'

'Now, I have to tell you that I hate midges. I hate them so much that I am going to put a horrible poison on the pond to kill all midge pupae so that the midges will never hatch.' Ask midge pupa to pull on rope.

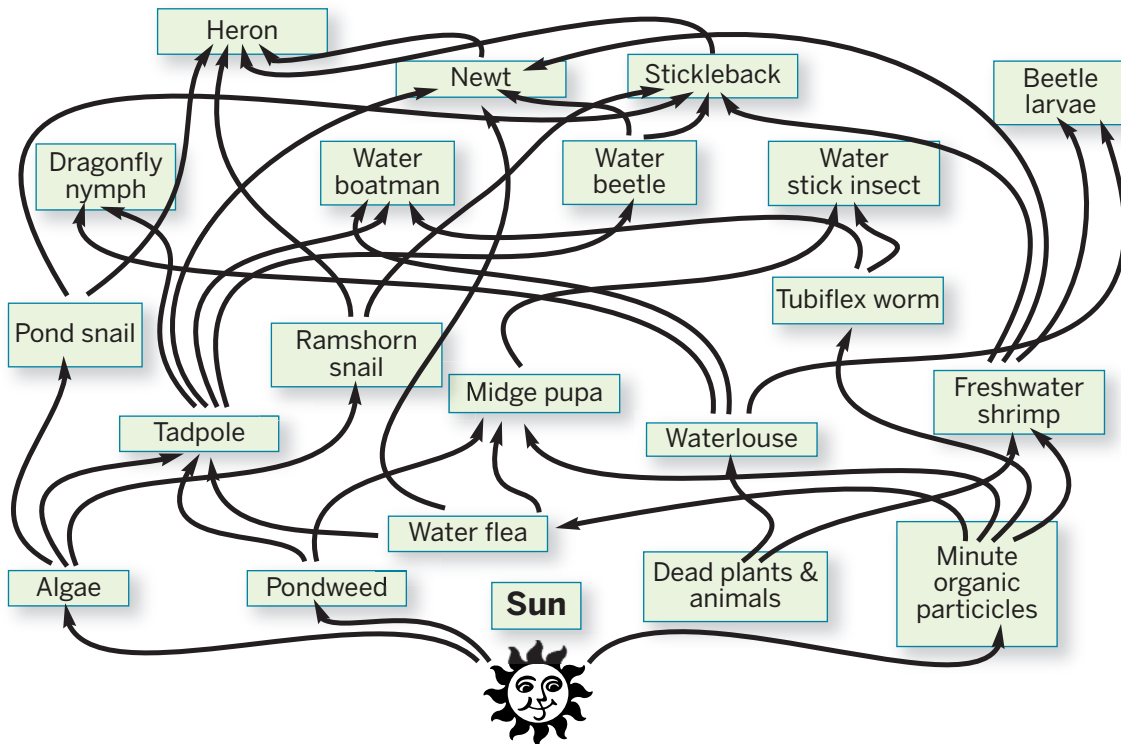
'Who felt that? What happens to the Water Flea if the midge pupa isn't eating it any more?' There will be more Water Fleas.

'And what happens to the plants if there are millions of Water Fleas attacking the plants?' There will be fewer plants.

'What happens to the Water Fleas if the plants are all gone?' The Water Fleas die.

'What happens to the other animals if the Water Fleas disappear?' The animals that live off Water Fleas will die or eat something else.

'Can you see how important each plant or animal is to the food web?' If we get rid of one, it will affect all the others . . .



Linked activities

COMPARING MINIBEASTS, MINIBEAST STATEMENTS

