BeePlus Project 2011

Soroptimist International (SI) in partnership with the British Beekeeping Association and Rowse Honey Ltd, are about to launch an exciting new initiative for Key Stage 2 pupils in Junior schools. We have produced a resource pack, that meets the requirements of the national curriculum, and is designed to take up one week of school time during the summer term. But it can be used flexibly, and aims to inspire children to think about beekeeping and how to make small differences that will help to prevent the decline in the honeybee. Longer term aims are to encourage schools and children to support Bee Charities, send hives overseas, and help provide an income, through beekeeping, for impoverished women and children.

Our pilot study in 2010 was very well received; teachers and children were delighted with the materials. For 2011 a manual for each teacher, a workbook and a goody bag for each child, and for the school, a set of posters and a CD so extra copies of materials can be produced will be provided free to every school.

Attached is a schools' brochure which explains who we are and what we are trying to achieve, a few sample pages from the teachers' manual and the possible options for covers (the design team are putting the finishing touches to the new look).

Please contact Joyce, as detailed below, if you would like to participate.

The deadline is **28 February 2011** for recruiting schools, in order to organise the printing and publishing and delivery to schools by the first week of the summer term, so don't delay!

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Our Mission

Soroptimists inspire action and create opportunities to transform the lives of women and girls through a global network of members and international partnerships.

We work within six programme areas and have ten focussed objectives, aligned with the UN Millennium Development Goals.

http://soroptimist-gbi.org/

BeePlus progress so far

Our successful **Pilot Project**, sponsored by

involved 4 schools, 16 teachers and 430 children. Three of those schools are already planning to put hives on or near their properties.

The children described the experience as "*really amazing*" and commented "*the honey cakes were delicious*".

Teachers were also enthusiastic, "*Thank you for all the resources, they are wonderful*" and "*The whole school from Nursery to year 5 were involved*".

BeePlus course overview

The materials are a user friendly flexible resource, that fit into the science curriculum, but can be used in a cross curricula way. Teachers can take a "pick & mix" approach, to suit their own requirements. They can take a week or a term, involve the whole school, or just 7-9 year olds. They can do all the activities or just choose ones they think are most suitable to their groups.

The topics covered are:
1. All about bees
2. Honeybee colonies
3. Beekeeping
4. Honey and beeswax
5. Problems and solutions.

(see back page for how to sign up a school for the roll out in 2011…)

BeePlus project on the decline in the honeybee population

Our educational project, aimed at key stage 2, has the specific aims of:

1. Raising awareness of the problem;
2. Making children and their families aware of the small things they can do to make a difference;
3. Stimulating interest and excitement about beekeeping;
4. Influencing good practice;
5. Encouraging schools to support bee charities, adopt hives, and send hives overseas.

(progress report and details inside)

Roll out of BeePlus 2011

We are hoping to involve up to 10,000 children across the country, in about 200 schools.

If your school is interested, please do one of the following:

1. Contact your local Soroptimist Club (maybe the person who gave you this leaflet), or
2. Register your interest at http://soroptimist-gbi.org/virtual-one

If you participate, you will receive a comprehensive resource pack with all the materials you need for the teachers and the children, at no cost to the school.

BeePlus

An interactive Project for Key Stage 2 in Junior Schools

from

Soroptimist International Virtual One

The online soroptimist club with a difference!

In partnership with the British Beekeepers Association

Honey bee quiz

How much do you know

You may do this quiz at home, or at school, on your own or in a group or swarm. You may need to consult the internet, look at books, or ask other people. You may start this at the beginning of Bees Week or at the end. Your teacher will tell you when you have to hand in your answers.

1.How many different species of bees are there in the UK
2.Which bees do not store honey
3.What are the 4 life stages of all bees
4.How many queen bees live in a hive and what are they fed on
5.What is the name for a male bee
6.Do bees drink water
7.How long have honey bees been on earth
8.Give the name of one flowering herb that bees like
9.Which tall bright yellow flower attracts bees
10.How much of our food depends on honey
11.Roughly how many hives are there in the UK now
12.What two things do bees forage for (nectar and honey)
13.What is the name of the parasite that attacks young and adult bees
14.How do hives help poor people in other countries such as Africa
15.What colour are honey bees
16.How many wings does a honey bee have
17.A bee has a long tongue. What is it called
18.Which part of the bees anatomy is used to gather pollen
19.What is a bees home made of
20.When a large crowd of worker bees leaves the hive, what is it called

There are 25 possible correct answers
Write down your score

Overview Day One

All about bees

Topics	Teacher information	Pupil information	Related worksheets	Other activities
Comparison of bees with other insects	Is it a bee Looking at mini beasts Is it a bee, pupil sheet with answers		Is it a bee	Design a bee motif Numeracy for bees
Structure and anatomy	Looking at a bee Bee Buzz game		Looking at a bee Label the honey bee	Colouring exercise Colour by numbers Make a honey bee
Different bees	Watching bees Different sorts of bees	Different sorts of bees	Different sorts of bees quiz	Watching bees – look at real insects in the playground or garden
Pollination	Why plants need bees Bees as pollinators	How bees pollinate flowers How seeds are made	Pollination	Colouring exercise

Teacher resources

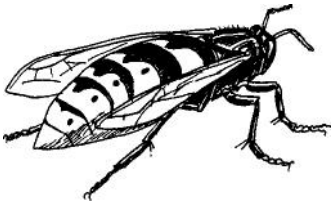
Pictures of bees and other insects – power point
Pictures and pollination diagrams 1 and 2
A bug box, magnifying lens
Media projector
You may find it useful to check out the BBC's "Bee part of it" campaign, a project presented by wildlife presenter Kate Humble. There are very good articles, pictures and videos

Is it a bee?

Honeybees are brownish or yellow and black and are smaller and slimmer than bumble bees. They too live in a colony but it is a much bigger colony of 60,000 bees. They nest in beehives or in the wild in hollow trees or holes in buildings. They do not die out in the winter because during the summer they have collected food to store and feed themselves when there are few flowers with nectar and pollen around.

Solitary bees vary widely in size, shape and colour. There are about 200 different sorts in this country alone. A female solitary bee builds her nest alongside nests of other similar females. Mining bees make their nests by burrowing holes in sandy banks, mason bees burrow into the mortar of walls and leaf cutter bees cut up leaves to make long tubes or line existing tubes. They are only active for a few months when the pollen and nectar they need is available. They are unlikely to sting unless their nests are handled or disturbed.

Wasps are often confused with worker honeybees. However they feed mainly on other insects and spiders which means that they are useful in keeping down insect pests in the garden. In flight, bees are single minded foragers on flowers, whilst wasps are hunting other insects as prey. The wasps do not collect pollen so they do not need branched hairs on their bodies and this, together with the very clear black and yellow stripes on their bodies, makes them easy to tell from honey bees.



Is it a bee?

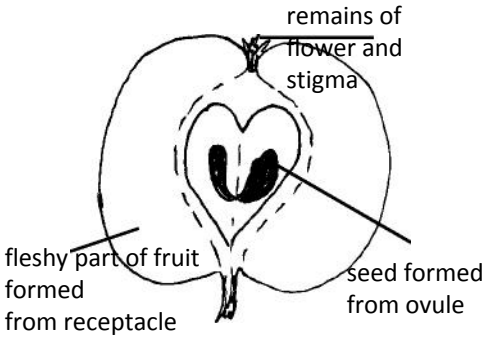
ant
bumble bee
butterfly
dragonfly
fly
honeybee
worker wasp

Why Plants and Flowers need Bees

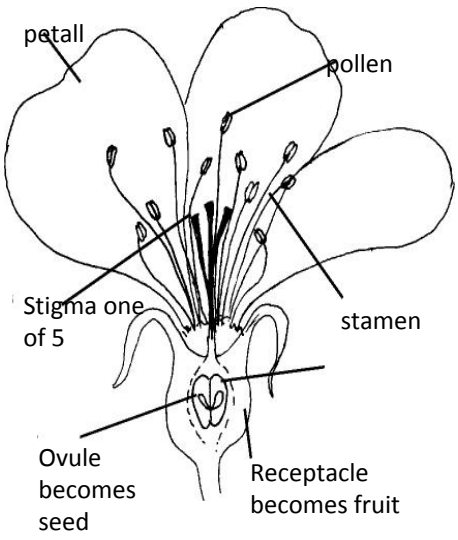
Do Plants need Bees?
This topic studies plant reproduction and the importance of the bee's role in pollination.

Background information

Plant reproduction Plants produce seeds which enable them to reproduce (at this juncture try not to mention other sorts of plant reproduction).
The flowers contain the reproductive organs.
In order for a seed to be made, **fertilisation** must take place. This is the joining of pollen on the stamen with the ovules. Once they have joined the resulting cell will grow into a seed.
For fertilisation to take place, **pollination** must occur. This is the transferring of pollen from the stamen to the stigma which stick out from the ovary. The pollen, or nuclei, move down into the ovary and fertilise the ovules to become the embryos of seeds. When the seeds grow the walls of the ovary and sometimes the receptacle get bigger in order to protect them. This is the fruit.



Apple cut in half to show the seeds



Only if the pollen comes from a plant of the same species will fertilization take place and a seed be formed. If the pollen comes from the same plant then it is called self pollination. If the pollen is from a different plant of the same species then it is called cross pollination.

For certain plants cross pollination is advantageous., and this is why insects which transfer pollen from pant to plant are so important. Although many other insects pollinate flowers, honeybees are particularly important because they will collect nectar from one species of flower at a time during foraging trips.

Orchards containing apple trees and similar fruits benefit from pollination by honey bees, because all the ovules are pollinated at the same time. This results in the fruit developing fully and evenly.

Growers of red and black currants notice significant improvements in yield when bees have access. Both size of berries and number of berries can double giving a four fold increase.

Apple flower with front half cut away

Overview Day Two

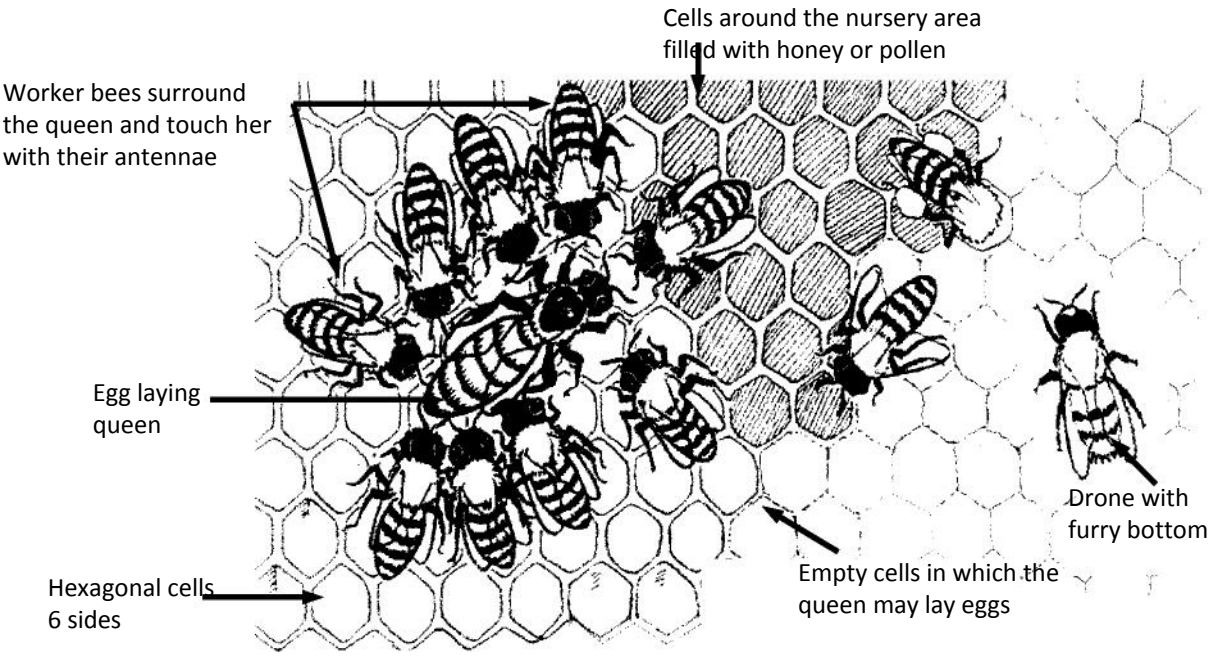
Honey Bee Colonies

This topic considers the honeybee as a social insect (a member of a colony).
It deals with the three different types of honeybee, the nest structure, nutrition, division of labour, the reproductive cycle, seasonal changes, foraging etc.

Topic	Teacher information	Pupil information	Related worksheets and activities	Other activities
Inside a beehive	Inside a beehive	Inside a beehive	Inside a beehive 1 Inside a beehive 2 Inside a beehive 3 Inside a beehive 4	Hexagons: make some patterns Look for hexagons at home and record what you find
How a honey bee grows		How a honey bee grows	Make your own poster showing the life of a honey bee	Bee statistics. Some arithmetic based on bees in the colony
Honey bees at work		Honey bees at work	Busy bees 1 Honey bees at work Colouring bees on the honeycomb	Hexagons and other shapes. Can you name them Matching numbered bees to the honeycomb

Teacher resources
Power point for day two; piece of honeycomb; Life of the honey bee wall chart

Inside a beehive



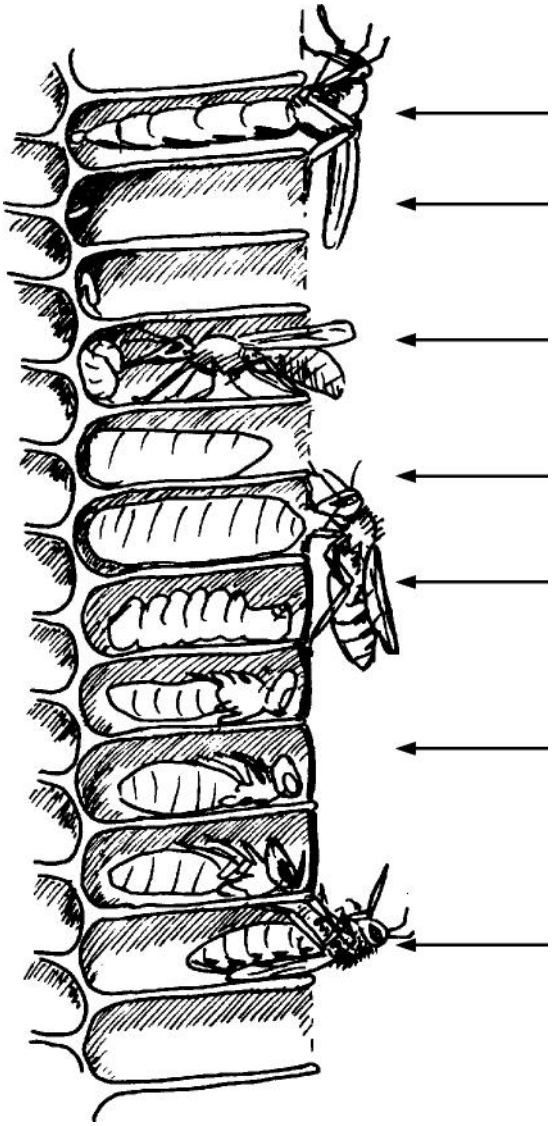
Bees on honeycomb

Honeybees live together in a colony. Their home is made of beeswax combs. The combs are made up of open cells each big enough to hold one bee. They use some the cells to store their food, nectar and pollen. In other cells the queen bee will lay eggs. The eggs will hatch out into tiny grubs which are fed by the worker bees. In three weeks the grubs will become new worker bees.
In the summer the colony is made up of about 60,000 honeybees, including a few hundred drones which are males, but only one queen.

The **queen** is bigger than the worker honeybees in the colony and her only job is to lay eggs. She is fed by the worker bees on royal jelly which they make in their bodies in a way similar to cows making milk.

The **drones** also are bigger than the workers. They are the male bees. Their job is to mate with new queens.

How a honeybee grows



The queen lays one egg in each cell

3 days later the egg hatches into larvae

Worker bees feed the larva. At first it is fed on royal jelly, but later on a mixture of honey and pollen

5 days after hatching, the larva is large and fat and fills its cell

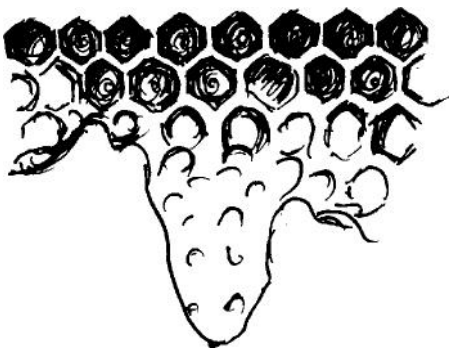
Worker bees seal the cell with wax

Inside the cell, the larva spins a cocoon and pupates

3 weeks after the egg was laid, the young bee bites through the wax and emerges as a fully grown worker bee.

Drone eggs are laid in slightly larger cells than workers

The cells in which queen bees are raised are much larger than those for workers
The queens are fed on royal jelly for all of their life.
Larvae growing into queens eat more food than those growing into workers



A queen cell

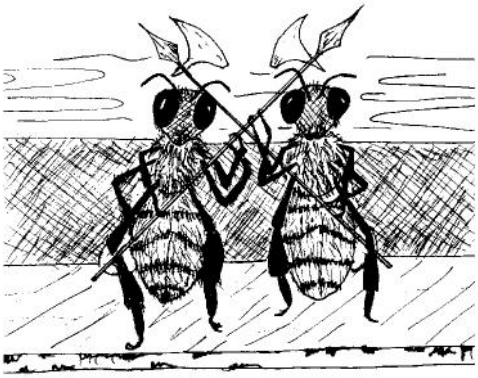
Busy bees 1

What are the bees doing? Write your answer in the boxes

1

2

3



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Overview day three

Beekeeping

This topic looks at the way bees are kept in the UK. It aims to show that bees need care and protection in the same way as do the more familiar farm animals. The children will learn how the beekeeper is able to work safely.
The topic prepares pupils for their visit to see bees and beekeepers at work

Topics	Teacher information	Pupil information	Related worksheets and activities	Other activities
Beehives and beekeepers	How a beekeeper cares for his bees	Beekeepers at work	Visit a Virtual Hive on the web	Make a model beehive Make a Bee Hotel
Visit to BBKA Club			Visit to a local beekeeping association club	Word search

Teacher resources
Internet access for pupils

NB: Schools should do a risk assessment and take advice from the BBKA Club they are proposing to visit

How a beekeeper cares for his bees

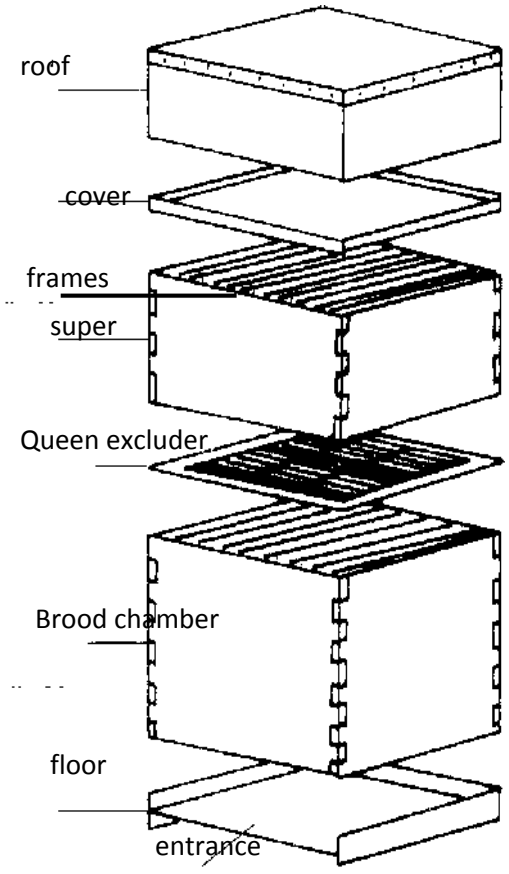
Background information

In the wild, honeybees nest in hollow trees. Beekeepers used to keep bees in a variety of containers e.g. hollow logs, baskets, clay pipes and wooden boxes. However it is not easy to get the honey out. It usually results in destroying the colony.

Nowadays in developed countries honeybees are kept in 'removable frame' hives. A beekeeper will fix in the frame a sheet of foundation which is made of thin beeswax imprinted with a hexagon pattern on both sides. When these frames are placed side by side in the hives the bees build their combs on them. The beekeeper is then able to remove the combs for inspection and for harvesting honey

The hives are usually made up of wooden boxes without base or top, which can be stacked on top of each other. In a typical hive the bottom box is put on a floor with a slit at the bottom as an entrance for the bees and the frames are hung from ledges on the sides. On top of this is placed a metal screen with holes in it big enough to let through the worker honeybees but too small for the queen to pass. This is called a 'queen excluder'.

A removable frame hive



The queen excluder ensures that the queen can only lay eggs in the bottom box, so all the brood rearing takes place here. It is known as the brood box. Other boxes are placed on top of the queen Excluder. The upper boxes are called 'supers' and it is here that the bees store most of the honey (and some pollen). A board is put on the top to seal the hive and a waterproof roof is placed over it. When the combs in the supers are full the beekeeper can simply remove the whole box and replace it with another one containing empty combs.

Overview of Day Four

Honey and Beeswax

Topics	Teacher information	Pupil information	Related worksheets and activities	Other activities
All about honey	Honey		The story of honey My advert for honey The Honey Judge	Colouring in and writing a story about honey
Recipes and cooking activities	Children's sweet making activity Easy recipes	Easy recipes to take home	Making honey buns	My Cooking using recipes for honey Cake sale
Beeswax	Beeswax Making Foundation Candles		Beeswax	Collecting honey and Beeswax
Hexagons		Hexagons	Drawing hexagons	Crossword

Teacher resources
Beeswax candles

Honey

This is a very good topic for introducing vocabulary and ideas about the properties of different materials

Background information

How honey is made

Honeybees collect a sweet juice called nectar from flowers. They suck it through their proboscis into their stomach or honey sac. In the stomach it is mixed with Juices (enzymes) which cause it to be changed into honey. The bees put the honey into the hexagonal wax cells which make up the honeycomb. They also keep it warm and well ventilated in order to drive off excess water. When the honey is thick enough they cover each cell with a capping of wax. The honey is then ready for the bees to use as food in winter when there are no flowers producing nectar.

The work of the beekeeper

The honey is separated from the wax combs by extraction. The wax cappings are first sliced off then the combs are placed in an extractor which works like a spin dryer. It is rotated rapidly so that the honey is thrown out, hits the sides and runs out at the bottom in the same way as the water is spun out from wet washing. The honey is finally filtered and bottled.

Some facts about honey

- Honey is an energy giving food for both bees and humans. We need energy to keep our bodies warm, to move about and to think. Bees need energy too.
- Honey consists mainly of the two simple sugars, glucose and fructose (75%). Most of the sucrose which was present in the original nectar has been converted to these simple sugars. The bees also reduce the water content to less than 20% which means that yeasts cannot cause fermentation. Good honey has unparalleled keeping properties.
- Most pure liquid honey will crystalise if stored but this does not indicate deterioration. If preferred in a liquid state it can be heated gently to restore it to its clear state. Put the jar in a saucepan of hot (not boiling) water or use a microwave oven. Do not heat above 55ºC as heating drives off its natural fragrances
- The honey from some flowers crystalises more rapidly than others. Rape seed honey is notorious for its rapid and very fine granulation. Honeys which take a long time to crystallise form large (gritty) crystals.
- Heather honey is very unusual since it is thixotropic. This means it is jelly like and thick but if stirred vigorously it will become runny for a while.
- Many people like to eat honey in the comb. Such honey will contain more pollen than that which has been extracted and filtered. It will also not have been warmed, and as such contains all the possible natural ingredients present in honey. It is particularly tasty served on toast. The wax is harmless and is not digested.

Collecting honey and beeswax

The beekeeper is trying to get some honey from a beehive to eat and to sell Can you help?
What must the beekeeper do first? Second? Third?
Put the pictures in the correct order by writing number **1, 2, 3, 4. 5, 6, 7, or 8** under each picture.
Colour the pictures on this page.'

Overview Day Five

Decline in the honeybee population
Causes, consequences and solutions

Topics	Teacher information	Pupil information	Related worksheets and activities	Other activities
The importance of honeybees and pollination	The importance of honeybees	Why honey bees are important Waggle dance	Pollination quiz 1 Pollination Quiz 2	Waggle dance game
Decline in the bee population	Why bees need protection	Where have all the bees gone?		
Possible causes and consequences	Facts about decline	More interesting facts about bees	Make a poster	Research topics
Some solutions	Ten things you can do	How you can be kind to bees	Make a bee friendly garden Bee Quiz (day one)	Fund-raise for bees and hives

Teacher resources:
Go to the BBC website for information on their project "Bee part of the campaign". There is excellent information and pupils will benefit from seeing Kate Humble's video about the problems facing beekeepers.
Children will probably enjoy dressing up as bees for the day, or the week, and could raise money for a bee charity.
Hopefully some of the follow up activities will continue

Pollination Quiz 2

Fill in the blanks using words from the list below.

A----------attracts the ---------- bee by its scent and by it's brightly coloured ----------

When the ---------- bee finds a flower full of ----------she returns to the hive and dances on the surface of a ----------to tell the other bees where the ----------is.

The ----------is on the ---------- of the flower.

When the bee climbs inside to get the nectar the pollen is picked up by the ---------- on the ----------and the bees pack it into the ----------on their ----------

The bee ----------many different ---------- in one flight, and the pollen from one flower ----------on to others to ----------them.

Farmer's crops such as ----------and ----------and orchard fruits like ----------and ---------- are also pollinated.

This makes sure everything ----------well.

apples
flower
legs
pollen baskets
beans
flowers
nectar
pollinate
bee's body
food
oil seed rape
rubs off
comb
grows
pears
stamen
foraging
hairs
petals
pollen
visits
worker

More interesting facts about bees

In Summer, a typical hive of honeybees might contain:-

1 queen
250 drones
20,000 female foragers
40.000 female house bees
5,000 to 7,000 eggs
7,000 to 11,000 larvae being fed
16,000 to 24,000 Larvae developing into adults in sealed cells.

There are 60,000 bees on average in a colony.

It takes 2,000,000 flowers to produce half a kilogram (a jar) of honey.

Bees will fly 90,000 km to collect enough honey for one jar.

A bee flies at 8km/hour.

A worker bee will only collect half a teaspoon of honey in its life.

2 tablespoons of honey can fuel a bee to fly around the world.

One bee will visit 50 to 100 flowers per trip.

Bees have been around 10 to 20 million years.

The honey bee did not exist in North America and it was called White Man's Fly when it was brought in by the colonists.

A worker larva is fed an average of 1300 meals a day.

To make 1 Kg of wax, it is estimated that a bee must consume 4 Kg of honey.

Overview of Day One

All about bees

TOPICS	TEACHER INFORMATION	PUPIL INFORMATION	RELATED WORKSHEETS	OTHER ACTIVITIES
Comparison of bees with other insects	Is it a bee? Looking at mini beasts Is it a bee? - pupil sheet with answers		Is it a bee?	Design a bee motif Numeracy for bees
Structure and anatomy	Looking at a bee Bee Buzz game		Looking at a bee Label the honey bee	Colouring exercse Colour by numbers Mahe a honey bee
Different bees	Watching bees Different sorts of bees	Different sorts of bees	Different sorts of bees quiz	Watching bees - look at real insects in the playground or garden
Pollination 1	Do plants need bees? 1 and 2	Do flowers need bees?	Do flowers need bees?	Colouring exercise

OTHER RESOURCES

Your school or public library will probably have many books on honeybees.
Look for the following:

"The Honeybee Man" Lela Nargi and Krysten Brooker

"The Life Cycle of a Honeybee" Barbara M Linde

"Flutterbugs: Heather Honeybee" Erica-Jane Waters

BeePlus project for schools

Easy recipes using honey

HONEY BUNS

Weigh 2 eggs and mix with their weight in S.R. flour their weight in margarine slightly less than their weight in honey. Dried fruit to taste.

Pour into paper cases and cook at 190°C for 10 to 15 minutes. Makes 12 buns use standard weights or volumes eggs (no shell) 120g

2 whole eggs		
S.R. flour	120g	8 tblsps
margarine	120g	6 tblsps
honey	100g	2 tblsps
sultanas (eg)	60g	4 tblsps

HONEY SWEETS

Mix together
200g sieved icing sugar,
1 dessertspoon of honey
enough egg white to
make a stiff paste.
Form into balls, decorate
with nuts and leave to dry
in a cool place.

HONEY LEMONADE

Into a saucepan place:-
the outer rind of 5 lemons
the juice of these 5 lemons
1 litre of water
Bring slowly to the boil.
Remove from the heat and leave until completely cold. Strain liquid and gradually add 6 tablespoons of honey stirring continuously until dissolved.
Chill thoroughly before serving.

HONEY FLAPJACKS

Melt together 100g honey with 75g margarine.
Stir in 50g raisins, 25g cherries and 25g mixed peel.
Finally add 150g porridge oats.
Mix thoroughly.
Press mixture into a greased tin (approx 28×55cm).
Bake in oven 180°C for 30 min.
Allow to stand in the tin until partly cooled, then cut into fingers or squares and remove from tin.
Cool completely on a wire rack.

HONEY SCONES

HONEY SCONES
Rub together 200g S.R. flour and 50g margarine.
Add 1 tablespoon of honey and a little milk to make a stiff dough.
Roll out and cut into rounds.
Cook in a hot oven.

HONEY DROPS

Step 1 Blend 1 cup honey with 1 cup peanut butter

Step 2 Add 2 cupsnon-fat dry milk powder and one tablespoon vanilla and half a cup of Granola or favourite cereal

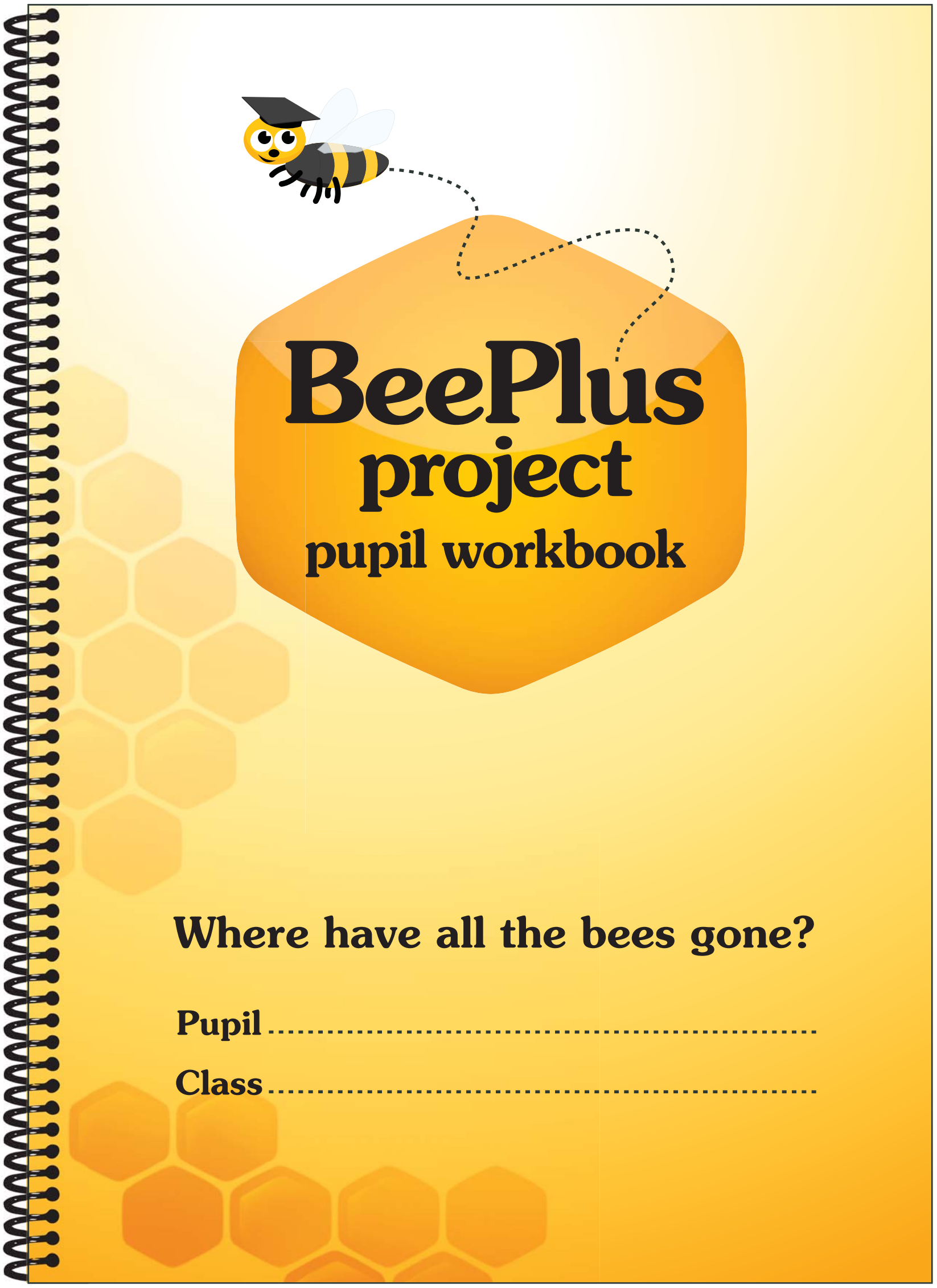
Step 3 Shape dough into small balls and put them on a plate or pan

Step 4 Place in the refrigerator for 30 minutes

Step 5 Share with your friends!

BeePlus

- Pupil workbook



BeePlus

- Pupil workbook back option 1