Bringing a BUZZ to the Curriculum

School based activities about honey bees for 5-11 year olds

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April 2013 Updated March 2017

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Introduction

During 2012 Penrith Beekeepers piloted projects with two schools to develop pupils' awareness of:

- the role of the honey bee in the pollination of plants,
- the different types of bees and other pollinating insects
- how honey bees develop
- how beekeepers look after bees

Some key activities were undertaken with both Key Stage 1 and Key Stage 2 pupils:

- looking at live bees in an observation hive
- candle making
- honey tasting

Additional activities were designed to specifically address aspects of the Key Stage 1 or 2 curriculum.

Sessions were led by two former primary school teachers and supported by other, more experienced, beekeepers.

Although Penrith Beekeepers Association would like to continue to provide opportunities for pupils to learn about bees, we recognise that we may not always have the capacity to support a large number of schools and that it is probably best if teachers adapt and develop activities so that they are appropriate and relevant to their pupils.

The purpose of this booklet is to :

- provide information about the resources and approaches which were successfully used with the two pilot schools

- recommend other relevant educational resources which can be accessed through the British Beekeepers Association and Suppliers of Beekeeping Equipment.

Further information about the pilot programmes can be found on the Penrith Beekeepers website: www.penrithbeekeepers.org.

We hope you will find these resources useful .

Margaret Riches
Treasurer, Penrith Beekeepers Association
April 2013

Projects about bees and other pollinating insects: relevance to the National Curriculum

The projects which were undertaken in the pilot programmes were **cross-curricular** but they were particularly relevant for developing **Scientific Enquiry (SE)** and children's understanding about **Life Processes and Living Things (LPaLT)** .

The key learning objectives of these projects and their relevance to the **science curriculum** are indicated in the table below:

Learning Objectives	**Key Stage 1**		**Key Stage 2**	
	SE	**LPaLT**	**SE**	**LPaLT**
Raise awareness of some common insects	2a, 2b	1a, 1b 5b	1a, 1b	1a, 1c 5b
Explore the structure of a bee as an insect	2a, 2b	1a, 1b 5b	2c, 2e	1c 4a
Teach basic terminology common to all insects		4b	2a	
Compare different insects	2h, 2j	4b, 5b	2d	4c
Learn names and distinguishing features	2f	5a	2f	4c
Engender respect for bees and other insects		2e		5a

Projects about bees can address the following requirements in the 2016 National Curriculum Programmes of Study for Science and Maths at Key Stages 1 & 2:

At Key Stage 1 Pupils should be taught:

Yr.1. Animals : Identify and name a variety of common animals

Non Stat: Explore and answer questions about their habitat; have opportunities to learn the names of the main body parts.

Everyday materials: distinguish between an object and the material from which it is made; describe the simple properties of a variety of everyday materials

Non Stat: pupils should explore, name, discuss, raise questions about everyday materials so that they become familiar with the names of materials and their properties.

Yr.1 Mathematics: Geometry recognise and name common 2D ... shapes

Non Sats: Pupils handle common 2D...shapes

Yr.2. Living things and their habitats: identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.

Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.

Non Stat: Pupils should be introduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy. They should raise and answer questions that help them to become familiar with the life processes that are common to all living things.

Yr.2 Mathematics: Geometry

-identify and describe the properties of 2D shapes, including number of sides and line symmetry on a vertical line.

Non Stat: pupils handle and name a wide variety of common 2D ....shapes. Pupils read ..... names for shapes

At Key Stage 2 pupils should be taught:

Science: Yr.3: Plants: identify and describe the functions of different parts of flowering plants : roots; stem/trunk, leaves and flowers.

-explore the part that plants play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

*Non Stat***:** *Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on .... flowers for reproduction***.**

Animals: identify that animals, including humans, need the right types and amount of nutirition,.... they get nutrition from what they eat.

Non Stat: They might research different food groups and how they keep us healthy .

Mathematics: Statistics: interpret and present data using bar charts, pictograms and tables.

NonStat: They ....interpret data presented in many different contexts.

Yr.4: Science: Living things and their habitats: recognise that living things can be grouped in a variety of ways.

Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment

-recognise that environments can change and that this can sometimes pose dangers to living things.

Non Stat: Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat.

Pupils should explore examples of human impact ....on environments

Mathematics : Statistics: Solve comparison, sum and difference problems using information in bar charts....

Pupils should be taught:

Yr 5: All living things and their habitats: describe the differences in the life cycle of .....an insect

Describe the life process of reproduction in some plants and animals.

Non Sat: ..... observe life cycle changes in a variety of living things, for example plants; P.should find out about different types of reproduction including sexual and asexual reproduction in plants, and sexual reproduction in animals.

Properties and changes of materials: compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency....

Explain that some changes result in the formation of new materials....

Non Sat: Pupils should build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials ...

Yr.6: Living things and their habitats:

Describe how things are classified into broad groups according to common observable characteristics...

Give reasons for classifying plants and animals based on specific characteristics.

Non Sat: Through direct observations where possible they should classify animals into commonly found invertebrates (e.g.insects)

Cross Curricular Links

Other subject areas can be used to create a holistic approach to the learning experience. Some of these are indicated in the activity outlines in the following sections.

***'Bees in the Curriculum'* Schools Pack Key Stages 1 and 2 Published by the British Beekeepers Association (BBKA)** is another useful resource for showing how these projects can be developed to address aspects of the curriculum

Further information about this resource pack can be found on the BBKA website: http://www.bbka.org.uk/learn/. The CD is currently not available. A copy of the resource pack in ring binder form can be obtained by mail order : Tel. 0871 811 2282.

Additional activities and resources can also be found on this site: www.bbka.org.uk/kids/children's corner.

Key Activities which can be provided by the Beekeepers Association

1. Observing Live Bees

Providing it is at an appropriate time of year and the bees are available, an experienced beekeeper can bring an Observation Hive to the school. An Observation Hive is a purpose made box with room for two frames of bees which can be viewed through Perspex panels. When the bees are not being observed, the Perspex sides are covered so that the bees remain in darkness as much as possible. The beekeeper provides the bees with food during the visit by dripping liquid syrup onto the frames.

The observation hive remains closed at all times and unless it is inadvertently opened, the bees cannot escape. When the observation hive is in the classroom or the place where the children will observe the bees, it should be strapped to the table top.

A dampened towel should be available nearby in case bees do escape. This can be thrown over the hive to keep the bees enclosed.

To avoid knocking the hive over and to maximise the opportunity for the pupils to closely observe the bees, they should be:

- provided with a magnifier each (available from Penrith Beekeepers Association)
- organised so that a maximum of 6 pupils look at the bees at once (3 on each side of the hive)

An adult (the beekeeper) should be present at all times to make sure that the hive remains steady and to answer the pupils' questions.

One of the observational activities is to 'spot the queen bee'.

A specimen risk assessment sheet for this activity follows below.

NB In the event of a child being stung and showing signs of allergic reaction / anaphylaxis the emergency services should be contacted immediately.

Risk Assessment

Visit of Beekeepers to Primary Schools with live bees in observation hive

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Context: Penrith Beekeepers Association will provide children with an opportunity to observe bees working on a frame inside an observation hive. The aim of the project, with other classroom based activities, is to raise the children's awareness of:

- the importance of bees for food production
- the role of the worker and queen bees in the life of a colony
- the anatomy of a bee

The Observation Hive is a secure unit containing several frames of bees which can be viewed behind Perspex. The bees are fed with glucose syrup through a secure feeder and so the hive does not need to be opened at all while it is on the school premises.

Risk	Level of Risk: high/med/low	Recommended Actions to reduce risk
Children are stung **Individuals develop extreme allergic (anaphylaxis) reactions, which may rapidly worsen. Early symptoms could include:** • wheezing and hoarseness • swelling of the lips, tongue and throat, eyes/hands/feet/ **lips/ tongue/throat (bold: more significant)** • an itchy rash known as 'hives' The rash is raised and generally pale pink in colour. The raised areas are called weals (not everyone gets this rash) • feeling faint • a sense of impending doom • fast heart rate/ palpitations • nausea, vomiting and abdominal pain • runny nose	**Med** *It is estimated that there are between 1 and 3 cases of anaphylaxis in every 10,000 people every year in UK.* *About 20 people per year die in the UK due to anaphylactic reactions.*	The school has: • at least one Adrenaline pen * (a pre-filled syringe known as adrenaline auto injectors) with **at a dose level suitable for use with children.** • a designated member of staff who knows how to use it and is authorised to administer it **NAME**: ..... Additionally: • the designated member of staff is informed that there will be live bees on the school premises before the session commences • the name and whereabouts of the designated member of staff is known to all adults working with the children in the vicinity of the live bees **Children are observed for their reactions.** If there are indicators that an extreme allergic reaction is developing: • call 999 for an ambulance: give school address and postcode • contact the designated member of staff • the designated member of staff should administer the Adrenaline pen

Risk	Level of Risk: high/med/low	Recommended Actions to reduce risk
Bees escape	Low	The observation hive is: • securely closed • strapped to a table so that it cannot be knocked over • is always attended by an experienced beekeeper • a damp cloth is available so that if the observation hive is overturned and bees escape it can be covered and the bees remaining in the hive can be quickly contained • children have a pre-arranged procedure to ensure that they can make an orderly withdrawal from the room • at the beginning of the session the children are informed about: – how to observe the bees without touching the Perspex panels (magnifying glasses will be provided to assist this process) – the escape procedure Children observe in small groups e.g. max 6, closely supervised by an adult

Notes:

* Brand names include: EpiPen; Anapen; Juxta; Jext

Further information about anaphylaxis can be obtained from:

http://www.patient.co.uk/health/anaphylaxis

2. Candle making

Pupils will learn about the properties of wax and how heat changes it. This is the easiest and safest way to make beeswax candles, suitable for all ages. No molten wax is used.

Only beeswax sheets and appropriate wick should be used.

The sheets of wax should be kept at room temperature for at least 24 hours before use to ensure the wax is supple.

Work in a warm room. Alternatively, hold the sheet close to a hairdryer/radiator for a few seconds, or slightly warm the candle wax in a 'warming cabinet' (Penrith Beekeepers have this equipment). The warming cabinet is thermostatically controlled and the wax will only be warmed to a safe temperature.

1. Decide on the finished diameter of your candle (one 16" x 8" sheet, when rolled lengthways, has a diameter of just over 1").
2. Use the size of square braided wick one size smaller than the diameter of your finished candle.
3. Cut the wick ½" longer than the sheet and place it ¼" in from one edge.
4. Carefully turn up the edge of the wax and fold over the wick.
5. Begin rolling ensuring the ends of the candle are square. If you roll out of the 'square' simply unroll and start again.
6. The final edge of the sheet can be secured by warming the wax gently near a radiator and pressing carefully with the fingertips. Alternatively, a few small spots of wax glue can be used along the length of the edge.

For the design used in the pilot project, oblong sheets of candle wax are pre-cut diagonally and laid in the warming cabinet, separated by sheets of greaseproof paper.

Organisation

- The activity is suitable for Key Stages 1 & 2, but they need to work in small groups of 4- 6 with close adult supervision in case they need assistance.
- The instruction sheet for Key Stage 2 pupils is on the following page, but they may still need help and an adult can help them observe and explore the properties of the wax.
- Making two candles will take children approximately 20 minutes.

Resources

- **Sources of candle wax and equipment: Thorne Beehives**
  Tel: 01673 858555 sales@thorne.co.uk
- Other wax items and candle designs can also be purchased from Thorne Beehives

Candle making

- **There is enough wax for you to make two candles each**
- **Cut off a length of wick 14cms long**
- **Lay it on the shortest edge of the wax (ask a friend to hold it still for you)**
- **Roll the wax up**
- **Take care to roll it straight so that the edge at the bottom of the wick is level**

3. Honey Tasting Survey

Pupils will learn about the different sources of honey and, from the introductory talk, the way that bees visit plants to collect nectar and pollen.

Jars of 4 different types of honey will make the activity interesting.

Before tasting, the children should be encouraged to observe how the honey differs in colour and texture (some will be firm and some will be runny).

The jars should be labelled with a letter A-D so that it is easy to record the children's views on the survey chart.

It helps the children to visualise the flowers that were the source of the honey if small illustrations can be provided.

The instruction sheet on the following page provides an indication of how this activity can be approached with Key Stage 2.

At Key Stage 1 it is easier to pre-cut and spread the honey on pieces of bread on separate paper plates which are passed around the class.

The survey record sheet can be drawn on flip chart paper so that it is completed as a group and the information compared and analysed as a class / group.

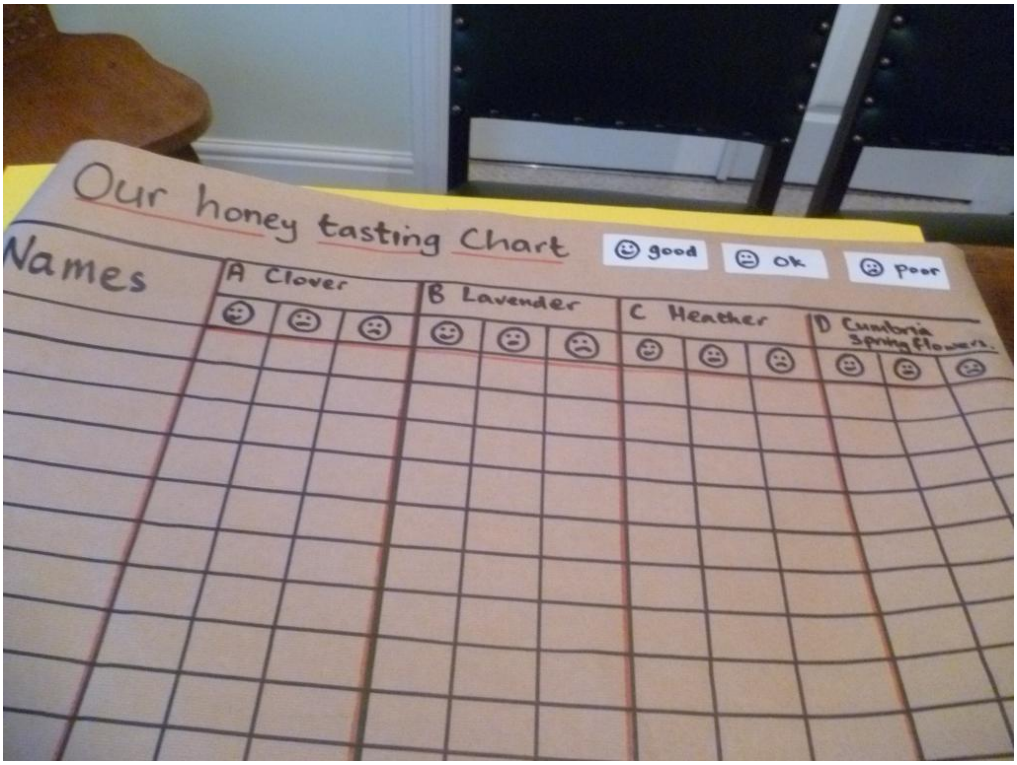
Organisation

Groups of 4 children with an adult supervising them are appropriate for this activity.

Resources

- several jars of honey: 4 different flavours e.g. heather / clover / lavender/ wildflower
- pictures of the flower sources also provided with jars
- slices of brown bread
- pre-drawn survey recording sheet

- disposable plastic spoons / knives for spreading
- kitchen towel



Sources of honey

- supermarkets – but they do not always sell local honey
- Co-op branch in Penrith, stock local honey when it is available
- Carricks (Penrith) stock a range of honey and honeycomb

Follow up

- Block / bar graphs can be compiled as a follow up activity.
- Key Stage 1: Winnie the Pooh story: *'Pooh Goes in Search of Honey'* from *'Return to the Hundred Acre Wood'* by A.A. Milne and E.H. Shepard. (ISBN: 978-1-4052-4744-3)

Honey Tasting Survey

- **Cut your slice of bread into quarters (4 equal size pieces).**
- **Use the spoon to scoop a small sample of honey from one of the jars on to a piece. Spread it onto one of your pieces of bread.**
- **Taste it.**
- **Decide how much you liked it.**
- **Make sure you remember which type of honey it was.**
- **Write your score onto the chart.**
- **Wipe your spoon on the kitchen towel before you try the next type.**
- **Repeat this for the other three types of honey.**
- **You can have the same scorings for each type if you cannot decide which tastes the 'best'.**

OUR HONEY TASTING SURVEY CHART

Names	Honey A			Honey B			Honey C			Honey D		
												

Winnie the Pooh Story: *'Pooh Goes in Search of honey'*

from *'Return to the Hundred Acre Wood'* by A.A. Milne and E.H. Shepard

The story has an introduction which is rather lengthy for reading aloud. The following adaptation enables the reader to start at the section of the original text which appears after the asterisksshown below in red font.

Adapted text:

One morning Winnie-the-Pooh woke up feeling very worried. He had dreamt that he had run out of honey. Pooh tried to imagine a world without honey and how difficult it would be to get out of bed in the morning knowing that the shelf in his pantry would be empty.

He climbed out of bed and went downstairs to the pantry to check on the number of pots of honey he had left. He counted one-two-three-four. "That won't last very long", he said. "I must find some more."

"Where does honey come from?" he asked himself. "I know, it's bees. But where are the bees? I haven't seen bees in Hundred Acre Wood for a long time."

Just as he was pondering on this Christopher Robin knocked on the door. "Do you want to come out for a walk with me Pooh?" he asked.

"Well", said Pooh. "That would be a good idea. I need to find some bees to get some more honey, but I haven't had my breakfast yet."

"All right", said Christopher Robin. "You have your breakfast and I will start to look for the bees. I am sure the other animals will know where they are."

So Winnie-the-Pooh put his paw on the first jar of honey and pulled it towards himself. " This is going to be my breakfast this morning", he thought. The trouble was, the honey was so delicious Winnie the Pooh ate another jar and almost finished a third jar.

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Meanwhile Christopher Robin set off on a tour of the Forest to ask if anyone had seen the bees. He started in the boggy place that was home to Eeyore.

"Lost your way Christopher Robin?"

"No Eeyore, I came to see you".

Additional Activities

Key Stage 1

An example of a Cross Curricular Unit of Work for Key Stage 1: Years 1 & 2

Topic: Bees and other pollinating insects

Week	National Curriculum Reference	Learning objectives	Suggested activities	Resources Red font: Activity sheets from BBKA 'Bees in the Curriculum' Resource Pack
1	**Sc1** Living processes and living things **Art & design** Exploring and developing ideas	Recognise the key features of pollinating insects Distinguish between honey bees/ bumble bees/ butterflies. Understand why bees/ other pollinating insects are important	Observe the bees in small groups/ pairs - what do they notice about the bees physical features/ behaviour Identifying sections of a hive (model hive) Picture sort: bees / bumble bees/butterflies Tessellating shapes: hexagonal patterns • to use as the cover for their topic book about bees • to create the background for a classroom mural/ wall display	**PowerPoint presentation** **Observation frames with live bees** • magnifying glasses **Bee frames** • showing hexagonal cells **Pictures & diagrams** • insects • bees • base sheet for sorting into sets • Pritt sticks **Model hive**

Week	National Curriculum Reference	Learning objectives	Suggested activities	Resources Red font: Activity sheets from BBKA 'Bees in the Curriculum' Resource Pack
1		Develop an understanding of : • the key features of insects and bees • that there are different types of bees • why bees are important • what happens inside a beehive • the role of a beekeeper Tessellation	Making bee models: pipe cleaners + egg box sections Bee Buzz: bee number game Plenary Q&A: of what has been learnt during the day Correct answer: holds puppet bee and thinks up a question for the group	**Buzz word hive** • outline of hive on flip chart + flash cards to attach (attach new words each week) • printed hexagonal outlines for decoration: coloured pencils/ wax crayons/ felt pens • polystyrene/foam cut out shapes attached to dowelling to create printing blocks • trays for paint • poster paint mixed to consistency for printing • base paper for printing onto • egg box sections – prepared for joining and colouring • pipe cleaners • wing shapes to attach • black felt pens **Bee Buzz** parts for game in groups of 4 (24 bees): • 6 spinners for dice • 24 hexagonal cells for bases **Beekeeper outfit/s** Looking at Mini beasts - Sheet G (page 15)

Week	National Curriculum Reference	Learning objectives	Suggested activities	Resources Red font: Activity sheets from BBKA 'Bees in the Curriculum' Resource Pack
2	**Sc1** Living processes and living things **Art & design** Investigating and making art, craft & design **Design & Technology** Developing ideas, working with tools & materials	Understanding: • the life cycle of honey bee • what bees collect • how bees communicate	**Puppet play**: **Lizzie the Busy Bee** rod puppets and shadow puppets to illustrate the life cycle of the bee, the collection of pollen, nectar and water. Creation of an imaginary insect shadow puppet **or** rod puppet with at least two moving parts. Design and make in pairs + other 'scenery'. Develop a story to show to rest of group: *A day in the life of….*	**Buzz words** swarm nectar pollen pupae brood **Puppets + scenery** • electric light or OHP Projector • table top cover • card/cellophane • shadow puppet screens: opaque paper stretched across the bottom of a box • pipe cleaners • materials for rod puppets if preferred **Writing materials and paper**

Week	National Curriculum Reference	Learning objectives	Suggested activities	Resources Red font: Activity sheets from BBKA 'Bees in the Curriculum' Resource Pack
3	**Sc1** Living processes and living things	Awareness of the natural products/materials that are produced by bees How heat changes materials Survey: collecting opinions and compiling a bar graph to show most popular honey flavour	Demonstration: extraction of honey from a frame Using the wax which comes from the comb and cappings. Candle making using wax foundation sheets Tasting honey (spread onto bread which has been made earlier) Honey Preference Survey: record preferences using smiley faces on chart Story: Winnie the Pooh (AA Milne) – stealing honey from tree Nonsense poem: Peas and Honey	frames wax foundation warming cupboard lengths of wick collection of honey to taste (at least three different types) teaspoons paper plates survey chart with smiley/Ok/sad faces to complete copy of Winnie the Pooh story copy of nonsense poem

Week	National Curriculum Reference	Learning objectives	Suggested activities	Resources Red font: Activity sheets from BBKA 'Bees in the Curriculum' Resource Pack
4	**Sc1** Living processes and living things **English** ***Listening***: Listen, understand and respond to others; f) identify and respond to sound patterns in language e.g. alliteration; rhyme; wordplay	To read and understand the structure of a range of poems, including narrative and nonsense. To recognize a range of linguistic features used to create meaning in poetry: alliteration, rhyme and repetition. Understanding the features of a flower which bees use for collecting nectar and pollen and the colours which most attract bees.	Action Poems and song: Two poems & Arthur Askey Song: Busy Bee Pupils pre-empt sounds and actions of poems. Listen and respond to the language and rhythm of poems: • read and repeat certain parts of the poem as a group with teacher • pick out rhyming words e.g. flew/ two • notice any repetition also change of adjectives: happy/busy/laden Discuss meaning of poem Act the poem: perhaps several times so all children/groups have a chance to perform Time permitting: repeat with nonsense poem 'Five Honey Bees'	2 poems to be provided by BC Arthur Askey Song: Busy Bee CD player Words to choose from for acrostic poems: • bees • hives • honey • pollen Paper plates and petals to record poems onto. Paper plates and paper /felt pens to make imaginary flowers (include strap handle already threaded through paper plates): to use in Week 5. Vocabulary parts of a flower: • petals • stem • stamens Silk flowers: different types of flowers

Week	National Curriculum Reference	Learning objectives	Suggested activities	Resources Red font: Activity sheets from BBKA 'Bees in the Curriculum' Resource Pack
4	**English** ***Speaking:*** Speak clearly, fluently and confidently by: b) choosing words with precision ***Group discussion:*** b) relate their activities to what has gone before **Music** Controlling sounds through singing and playing		Write or repeat a simple poem using acrostic structure in groups Petal Poems: creating group poems: (adult to work with each group) - acrostic poems recorded onto petals of flowers Making imaginary 'Magic flowers' that will appeal to bees: some to be used in bee dances in Week 5	Puzzle Sheet: Sniff way to flower The Honey Bee Colony Sheet (page 26)

Week	National Curriculum Reference	Learning objectives	Suggested activities	Resources Red font: Activity sheets from BBKA 'Bees in the Curriculum' Resource Pack
5	**Sc1** Living process and living things **PE:** ***Dance/ Movement:*** Responding to sounds and rhythm through movement	Understand the importance of warm up Responding to music through warm up and creating imaginary dances	Warm up: • 'buzzing' around in different directions • stop and start to signal • buzz on the spot to different heights following rising and lowering signal: using tambour as sound resource Buzz in figure of eight movement on spot - stop and start to signal. Waggle Dance: moving bodies in direction of flowers and the sun Explore other movement ideas : • in turn from small group • collecting pollen from one of the flowers in the room • returning to imaginary hive (mat on floor) • giving signal to other bees in hive to go to flower Working together in pairs or in a group in response to music: *Flight of Bumblebees ; Rimsky Korsakov* e.g. Swarming dance in small groups around queen bee. Leaving and returning to hive. Observe dances created by each group. Guess which bee is the 'queen'.	Tambour / other instruments to create sound signals Large paper sun Different model flowers selected from those created previous week PE mats / carpet squares CD Player for music Other props: Window frame from puppet play?

1 A Hexagons

Art: pattern making with hexagons

Mathematics: the properties of a hexagon; tessellation; the number of equal sides.

Relevance to bees:

- Honey bees build their cells with six straight sides.
- They fit together with no spaces.
- This means that the bees can build lots of cells next to each other.
- The shapes are called hexagons.

1. Title page for project book: creating a coloured hexagonal design

Resources

- title page template (page 29)
- coloured felt pens/ pencils

My Book About Bees

by

2. Hexagonal Sponge Prints

Use hexagonal printing blocks created from sponges such as ‘miracle sponges’ *(see additional resource section for further information*) / potato prints. (*Each side of hexagon measures: 4cms)

Press hexagonal shapes into paint which has been spread onto a sponge based in a shallow tray such as a Styrofoam meat tray/ or egg box lid.

Pupils print tessellating hexagons to fill A3 sheets of paper.

For display: teacher makes larger hexagonal card template from A3 sheets (* each side of hexagon to measure 14cms) and uses it to cut out the children’s printed designs. The larger hexagonal shapes can then be displayed.

Resources

Source of compressed foam blocks in hexagonal shapes e.g. furniture sliders based in plastic hexagonal cups available from Pound Fever shops (pack of 4 Furniture Sliders £1.) or ‘Miracle Sponges’ *(see additional resource section for further information*)

Use glue gun to attach a small plastic lid to base of furniture slider to provide a ‘handle’ to grip for printing.

Alternatively remove foam hexagons from plastic cups and glue to wooden * pre-cut hexagonal bases.

Make sponge paint bases by cutting up 1” sponge into oblongs to fit inside the lids of egg boxes (half dozen size).

Spread mixed poster paint onto sponge bases (e.g.available from Early Learning Centre shops) in colours which will represent pollen cells, e.g. red / orange / blue / yellow

* Drawing hexagons: Instructions for drawing hexagons are in the BBKA Resource Pack: Beeswax: Sheet E ‘Hexagons’

1 B English: Reading, Speaking and Listening

i) Buzz words

- outline of hive on strong card
- lower sections covered with self adhesive black felt
- individual words written onto hexagonally shaped cards. Velcro squares on back to adhere to felt base.

Example of Buzz words:

drone	**hive**	**pupa**	**hexagon**
nectar	**swarm**	**worker**	**brood**
waggle	**dance**	**bees**	**flowers**
pollen	**queen**	**honey**	**wax**

Words are introduced as the project progresses so that the 'hive' is gradually filled with 'word cells'.

Previously introduced words are 're-visited' each session: sometimes removed from hive and used as flash cards.

When a pupil successfully reads the word he / she sticks it back on the hive.

Resources

- hive outline drawn / painted onto thick A1 card base
- black self-adhesive felt
- cardboard hexagons: various colours to represent pollen cells .e.g. each side of hexagon measures 6 cms
- words on hexagonal shapes
- self-adhesive velcro attached to back

ii) Poetry

Objectives

- read and understand the structure of a range of poems, including narrative and nonsense
- recognise linguistic features used to create meaning in poetry: alliteration, rhyme and repetition

Example of a nonsense poem which could be used as a stimulus:

> ***'I eat my peas with honey***
> ***I've done it all my life***
> ***It makes the peas taste funny,***
> ***But it keeps them on the knife!'***

- Pupils pre-empt sounds and actions of poems. Listen and respond to the language and rhythm of poems.
- Write/ repeat a simple poem. Individual writing/ or group writing with teacher.
- Explore buzz words as a word bank resource and identify words that might rhyme with them to create:
  - nonsense poems
  - acrostic (Year 2)

Other poems

- Five Busy Honey Bees
- Baby Bumble Bee

Available from the internet at: www.dltk-teach.com/rhymes/bumblebee/index5htm.

iii) Songs

The Bee Song : Arthur Askey

Use as an action rhyme.

Internet source: http://monologues.co.uk/Arthur_Askey/Bee_Song.htm

Other songs:

- Baby Bumble Bee Song
- Buzzing Around the Room Song

Available from the internet at: www.dltk-teach.com/rhymes/bumblebee/

iv) Puppet play

A story to illustrate the stages in the life of a bee, its role as a young worker bee inside the hive and as a mature worker bee collecting nectar and pollen.

Title: 'The day that Busy Lizzie went to School'

Narrative outline	Action
One sunny day a beekeeper was walking through the forest on the way to his / her beehives. Suddenly he / she noticed a thick	Person dressed as a beekeeper walks along.

Narrative outline	Action
black shape hanging in the branch of a tree just above his/her head. ***The beekeeper recognised that this was a swarm of bees.*** ***The bees were clustered all around the queen bee.*** ***Quickly the beekeeper gathered up the bees and took them along to his hive.*** ***He found an empty hive and placed the bees inside it.***	He / she lifts up a small basket containing several soft toy puppets. One of the puppets has been decorated with a gold pipe cleaner to resemble the queen bee. The beekeeper takes the basket along to the hive at one end of the table. He / she appears to lift the basket into the hive. (**Photo 1**; page 38)
Inside the hive, the queen bee soon began to lay eggs. ***She laid hundreds and hundreds of eggs. The queen bee filled the cells on the frames inside the hive with her eggs.***	The card cover in front of the hive is removed to reveal the inside of the hive: coloured cells which are lit from behind. (**Photo 2**; page 39) Small beads/ sections of polystyrene have been stuck onto the 'cells' as to resemble eggs / growing pupa.
After several days the eggs began to grow into pupa. One of these pupa grew a little more quickly than the others and hatched into a worker bee. ***This bee was called Lizzie. She soon became very busy because the older bees gave her all sorts of jobs to do.*** ***She had to clean out the cells of the bees when the other bees had hatched so that the queen bee could use them to lay more eggs in.*** ***Lizzie was sent to feed the young bees in the bee nursery.***	Rod shadow puppet shape of larger pupa emerges from one of the cells. Shadow puppet bee shape: (made from black card and cellophane) takes the place of the pupa and moves around the hive. Bee shape moves around the cells as if it was doing different things.

Narrative outline	Action
Sometimes she had to collect the pollen from bees returning to the hive and store it in the cells.	
One day, the queen bee told Busy Lizzie that the next morning, if the sun was shining she would be leaving the hive for the first time. Her job was to go out into the fields and the forest to find nectar and pollen to bring back to the hive.	Bee shadow puppet remains still as if she is listening.
That night Busy Lizzie was so excited she could not sleep. She hoped that when she left the hive she would find flowers that would provide the nectar and the pollen that the bees needed. She worried about getting lost.	Background light is switched off so that the hive is in darkness.
The next morning the sun was shining. The other bees told Busy Lizzie to fly towards the sun and look for flowers on her way.	Rod puppet emerges from the hive.
Busy Lizzie flew around and discovered clusters of flowers everywhere. What he did not know was that she was flying towards 'Growing Well School'. The flowers she was visiting were in the school gardens.	Rod puppet flies around flowers on the table.
Suddenly Busy Lizzie saw an enormous flower higher up than the other flowers. She thought it was the prettiest, biggest flower she had ever	Rod puppet flies up towards the flower and appears to go inside the window.

Narrative outline	Action
seen. It was standing on a classroom window sill. The window was open because it was such a hot day.	
The children in the classroom heard Busy Lizzie buzz in through the window. They could see her buzzing around the flower. ***Some of them laughed because they thought she looked funny. Others screamed because they were frightened.*** ***The teacher shouted at the children, telling them to be quiet. She waved her hands towards Busy Lizzie trying to shoo her out of the window.***	Puppet circles around the flower. Teacher's hands wave around.
All the commotion frightened and confused Busy Lizzie. ***She flew further into the classroom, above the children's heads.***	Rod puppet disappears behind the scenery. It is swopped for an identical puppet which has pollen baskets on its legs.
Eventually Busy Lizzie saw the open window and flew out of it. She was glad to escape all the noise. She realised that her legs were feeling very heavy. Her pollen baskets were completely full. Her tummy was also full of the nectar she had sucked up from that enormous flower. ***Busy Lizzie thought she had better fly straight back to the hive.***	Rod puppet flies out of the school window.
Turning her back on the sun, she flew towards the hive. When she reached	Rod puppet flies back towards the hive.

Narrative outline	Action
the hive entrance the other bees greeted her. ***They were pleased to see all the pollen and nectar she had brought them. Busy Lizzie remembered that she had to waggle around to tell them where they could find the enormous flower so that they could collect more pollen and nectar as well.*** ***Inside the hive Busy Lizzie had a short rest. She thought it was the most tiring, but exciting day she had ever had.***	

Photo 1

Resources

- 2 rod puppets: stuffed fabric bees on lengths of plastic / wood. One of these puppets has yellow cotton wool balls attached to back legs to resemble pollen baskets
- 4 stuffed fabric bees for ‘swarm’
- scenery: old picture frames covered and extended to represent

Primary school with curtains and cardboard heads inside to represent children in class.

Beehive: hexagonal bee cells have been drawn onto plastic sheet to represent cells on a frame:

- back is covered with greaseproof paper to provide opaque surface through which electric light will shine
- miniature pots of silk flowers
- one larger silk flower in pot to place on ‘window sill’ of school building
- bee suit for ‘beekeeper’

Photo 2

1 C Physical Education: dance and creative movement

Dance / movement can be based on:

- the development of the honey bee
- honey dances
- growth of flower
- pollination and growth of fruit
- activities of honey bees in the hive
- swarms
- foraging and defensive behaviour

e.g. Waggle Dance:

A large cut out sun and large silk / paper flower are moved into different places. The children pretend they are bees and perform the 'waggle dance' to communicate where the flower is in relation to the sun.

Resources

For more information about the bees 'waggle dance' refer to BBKA Resource Pack: Section : Pollination Sheet E1 (page 57) & E2 (page 57a) Sheet H (page 70)

Music

'The Flight of the Bumble Bee': Rimsky Korsakov.

Suitable for warm up activity: buzzing around the room in different directions / moving into a swarm.

1 D Design Technology: models of bees

Develop understanding of the structure of a bee's body:

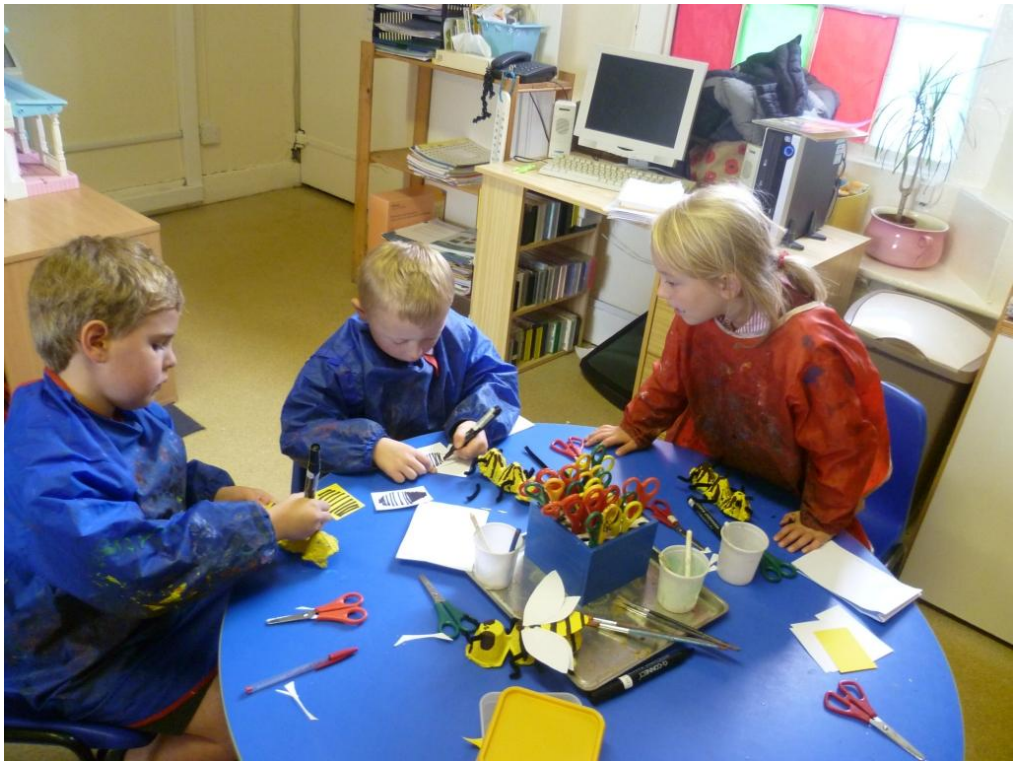
- head, thorax, abdomen
- six legs
- two antennae
- proboscis
- eyes

Resources

- egg boxes: egg box trays cut into sections of three to represent three parts of bees body
- painted yellow: ready mixed poster paint from Early Learning shops is suitable.
- point of compass / bradawl used to make holes for pipe cleaners to be threaded through.
- yellow card rectangle for abdomen
- black pipe cleaners for legs, antennae, proboscis , cut into appropriate lengths.
- white paper oblongs for wings: 2 small and 2 large oblongs for each bee
- black felt pens for markings and eyes
- small coloured (yellow/green) cotton wool balls to represent pollen

Method

- cardboard sections are cut and provided for each pupil with holes inserted in right places for legs and antennae to be threaded through and proboscis inserted
- sections are painted yellow
- black stripes and eyes are drawn onto egg box sections with felt pens
- abdomen cut out of yellow card; black stripes drawn onto it; glued onto the top of the egg box sections
- pipe cleaners are cut and inserted through holes
- antennae, proboscis and legs are bent
- wings cut out and glued onto the top of the middle section.
- pollen baskets attached with glue to back legs



1 E Mathematics: the Bee Buzz Game

Objectives

- number recognition
- recognising the parts of a bee's body

This game can be played by drawing the body parts as they are gained by throwing the required number on the dice.

This version is shown in BBKA Resource Pack: Section: Looking at Minibeasts-sheet F Page 14.

Alternatively the children can 'build' the bee from body which are provided (see below).

Resources

- black pipe cleaners for legs, antennae and proboscis
- yellow card for thorax, abdomen and head pieces
- white card for wings
- coloured card cut into large hexagon – representing a pollen cell on which the bee 'sits' when it is completed. **N.B.** *It is recommended that the hexagonal sides should be 10cms . so the template shown on page 45 should be slightly enlarged.*
- to start they must throw a 3 for the thorax, then 1 for the head and 2 for the antennae, yes and proboscis which are already joined as a complete section After that the rest of the body can be 'attached' in any order
- a hexagonal spinner divided into six sections with matchstick / cocktail stick through the centre can be used as a dice

The pupil instruction sheet is on the following page.

The Bee Buzz Game

You are going to make a bee to sit on your pollen cell.

To start you must spin 3 for the thorax.

Then in any order:

1 for the head, the antennae, the eyes, the proboscis

5 for an abdomen

6 for the legs

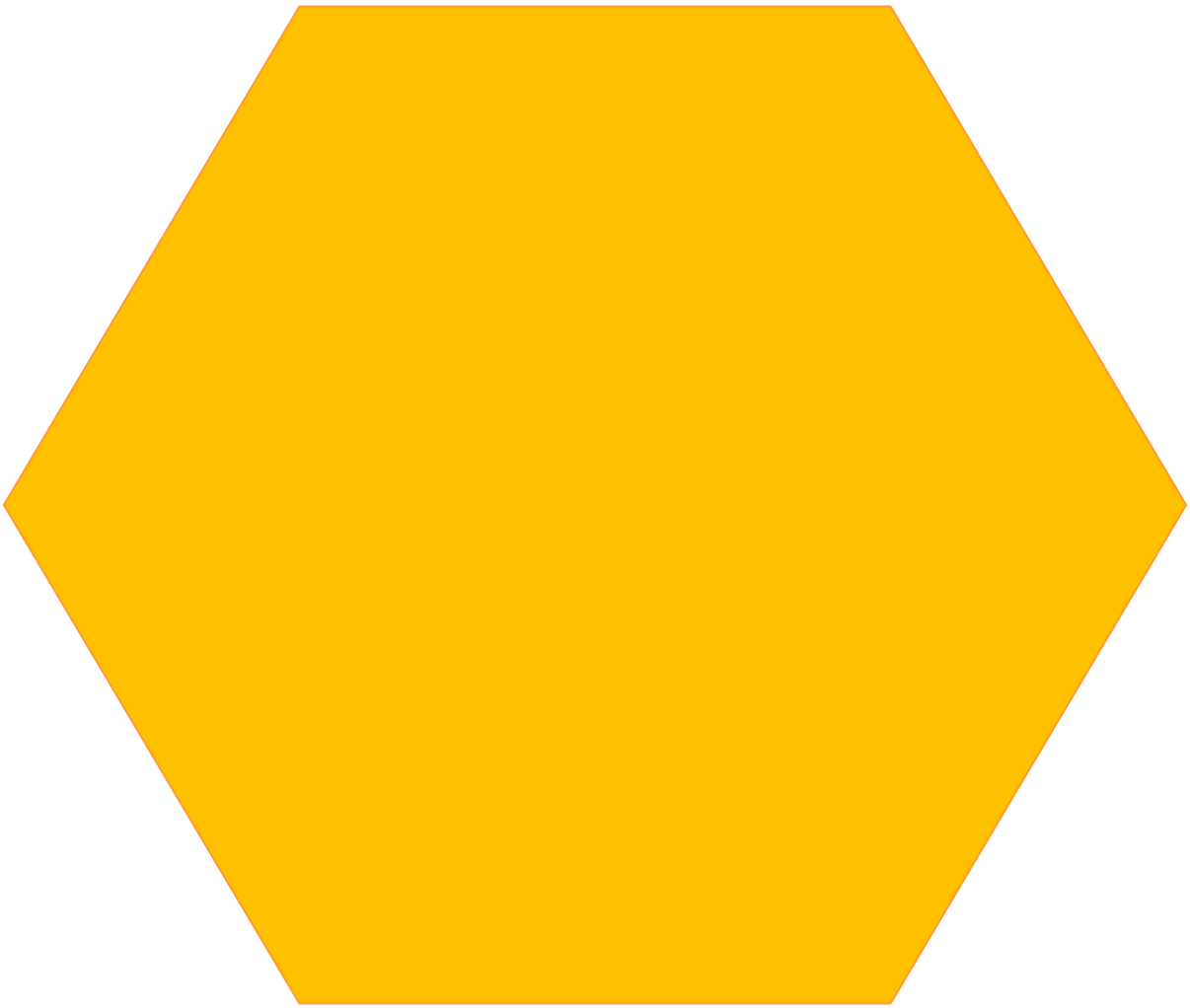
2 for the small wings

4 for the large wings

Shout BUZZ when your bee is complete on your pollen cell.

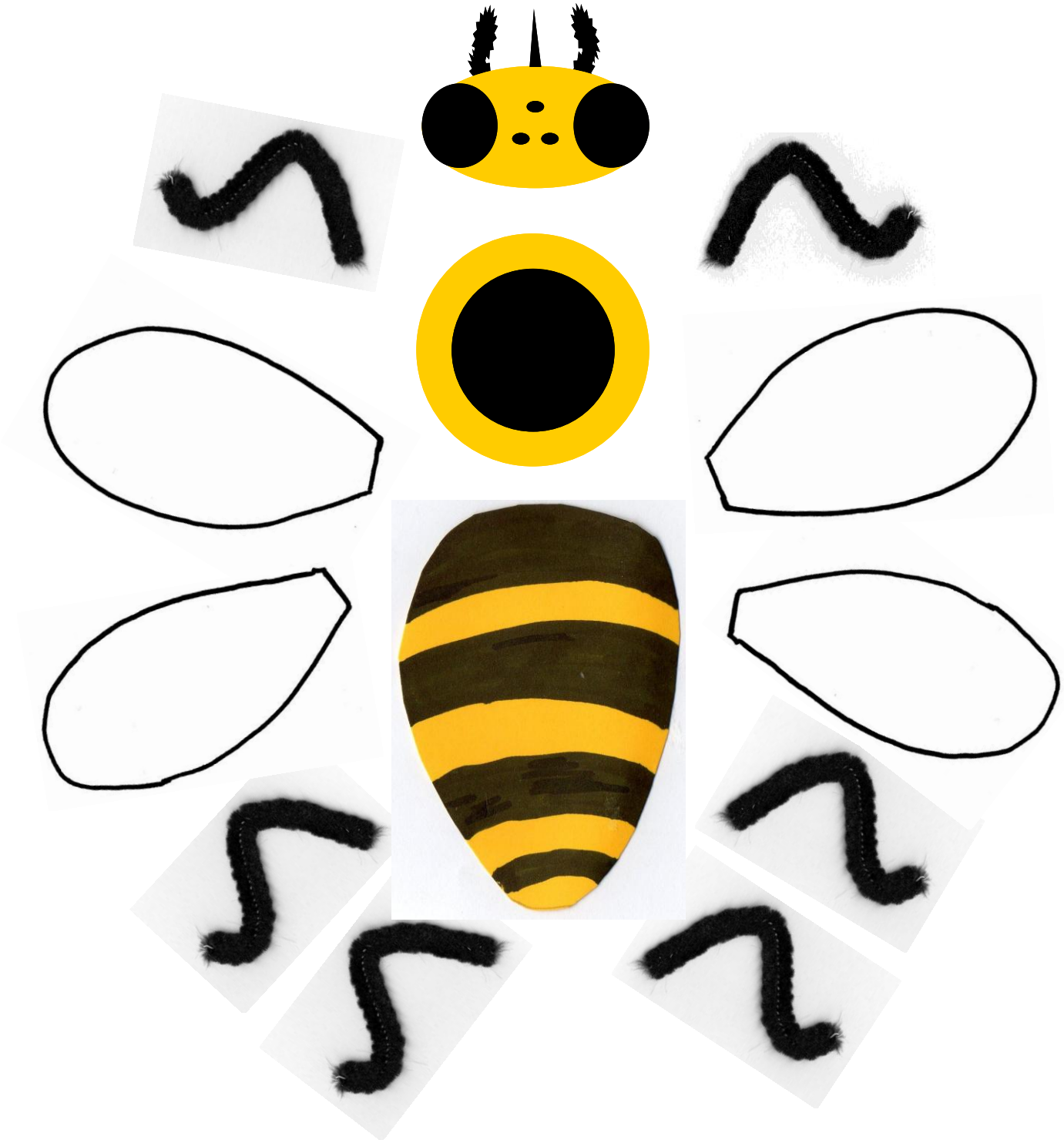
Templates for the Bee Buzz Game

1. Hexagonal pollen cell



Templates for the Bee Buzz Game

2. Bee body parts



1 F Science (Year 2):
identifying different types of pollinating insects

Objective

To recognise different types of pollinating insects:

- butterflies
- moths
- bumble bees
- honey bees

Activity

Pupils are provided with sheet which has descriptive sentences and another sheet with pictures of butterflies, moths, bumble bees and honey bees.

The pupils cut out the pictures and stick them onto the sentence sheet in the spaces alongside the correct descriptions.

Resources

- pupil sheet – following page, enlarged to A3.
- pictures of butterflies, moths, bumble bees, honey bees photocopied from BBKA Resource pack e.g. Looking at Minibeasts – Sheet D (Page 12) or from other sources.

Pollinating insects help flowers, trees and fruit to grow

- The butterfly will visit flowers in the spring and summer.
- Moths often fly at night.
- The big furry bumble bee makes her nest in holes in the ground.
- The honey bee can live in old trees and bee hives.

Additional Activities

Key Stage 2

2 A Science: identifying bee-friendly plants

Bees see colours differently to humans and this effects the plants to which they are visually attracted. Bees also want to gather the nectar from the plants and some are designed to hold more nectar than others. Plants also want to cross-pollinate and so some are shaped so that bees are more likely will brush against the stamens. Plants that are being developed for people's gardens are not always 'bee friendly' because they are often 'double flowering' and the bees find it difficult to access the nectar and the pollen because of the additional petals.

The following activity was designed to help pupils understand what bees see and the introduction to the activity raised their awareness of how bees gather nectar and pollinate plants.

The pupils are asked to imagine that they are undertaking a survey for the British Beekeepers Association to find out what types of plants people grow in their gardens and which ones are more likely to be 'bee friendly' – based on their observations of colour and shape.

Resources

- a collection of silk flowers individually labelled with an identifying letter of the alphabet
- the flowers can be pushed into a plastic trough filled with Styrofoam so that it resembles a garden ‘flower border’

Additional visual aids

The red poppy is an interesting example of how differently bees perceive flowers. The red petals appear black to bees , but what attracts them is the bright, iridescent grains of pollen which show up against the black petals. An example can be made by colouring the petals of a red silk poppy black with a felt pen and then gluing small blue glass beads along the inside of the petals.

A metre stick covered in paper can be marked with two coloured lines representing the different ‘light wave lengths’ which are seen by the human eye, compared to bees’ eyes.

Method

In pairs the pupils look at each flower, check the colour chart that they are given on the information sheet and complete the survey .

They examine as many flowers as they can in the time available and then recommend which ones should be grown in gardens at the bottom of their sheet.

Different views can be explored and discussed in the plenary towards the end of the session.

Follow up activity

Design Technology – design the perfect flower for bees

The colours that bees see

- ❖ Bees ‘see’ differently from us.

- ❖ Humans can see all the colours of the rainbow from red through to violet. These are within the wavelengths of light 750 – 370 nanometres (nm).

- ❖ Bees’ vision is slightly different. They see less than we do at one end of the colour spectrum but more than we do at the other end (650-300nm).

- ❖ Bees’ vision is complex and although they can detect a fairly broad range of colours, what they see falls into fewer categories than ours:
  - bees cannot see red – red appears as ‘black’ to them
  - because of the difference in light detection, what appears to the humans as ‘white’ seems to be blue-green to bees

- ❖ The chart on the next page shows the **approximate** colours seen by bees and humans.

What bees see		What humans see	
Ultraviolet light		*not visible to human eye*	
Blue		Violet	
		Indigo	
		Blue	
Green		Green	
Blue/green		White	
Yellow/green		Yellow	
		Orange	
Black *(red is not visible to bees' eyes)*		Red	
		Black	

Name: ..... **Date:** .....

My garden plant survey to find the best plants for bees

Scoring: 3 = very good 2 = good 1 = poor 0 = not at all

Flower Type Write down the letter on the flower	Will the **colour** attract the bees?	Will the **petal markings** guide the bees?	Will the bees be able to reach the **nectar**?	Will the bees be able to reach the **pollen**?	**Total Score**

Your Recommendation:

Which flower do you think people should grow in their garden to help the bees?

Why?

Design the perfect flower for bees

- What will the shape of the petals be?
- How many petals will there be?
- Will the centre of the flower be ‘flat’ or shaped like a ‘trumpet’ or a ‘vessel’?
- How long will the stamens and stigma be?
- Will the petals and the pollen rub against the bee as it goes into the flower?
- Will the flower have any markings to attract the bee into the centre?
- What colour/ will your flower be?

2 B Design Technology: the design of beehives, beekeeping equipment and the role of the beekeeper

Pupils examine a beehive which has been dismantled. This can be a model hive/nucleus box rather than a full-size hive. Pupils try to reconstruct it and work out what each section is for – particularly the removable frames.

Further information about how the designs of hives have changed over the years and why can be obtained from internet sites and the BBKA Resource Pack: Section – Beekeeping Sheet B.

Individual frames can be examined to see the different types of cells:

- brood cells
- pollen cells
- honey cells

A beekeeper will be able to explain how:

- honey and wax are extracted
- the ways in which bees have to be protected from disease and pests

Beekeeping equipment such as smokers and hive tools can also be examined and the ways that they are used discussed.

The beekeeper's suit can be examined and the reasons for its design discussed.

Resources

- sections of a hive
- frames
- bee suit
- examples of wax candles / types of honey
- small items of essential beekeeping equipment

Relevant sections in the BBKA Resource Park: Beekeeping sheets A – F.

2 C Religious Education: theme for an assembly

Harmony

- beehives have in excess of 50,000 in them during the summer season
- all the bees have specific roles and respond to each other and the messages that are conveyed to them from the Queen Bee
- no one is in charge of the hive: not even the Queen bee
- decisions are made jointly and on the basis of the future well being of the colony.

Additional resources

Craft items: e.g. Pipe cleaners, small cotton wool balls **Miracle sponges:** thinly compressed cellulose sponges that expand when wet. They are easily cut or torn into shapes, then dipped into paint and used to print. They are re-usable.	Fun2Do: UK mail order specialists of haberdashery and craft supplies www.fun2do.co.uk or at shop: 21 Scotch Street, Carlisle ***'How to do sponge printing'*** www.familycrafts.about.com
DVD: *The Honey Bee* (43mins) In sections for selected viewing. The honeybee is the story of the life of a colony with close up footage of the queen, workers and drones. It features communication within the nest, the excitement of the swarm, wax production, foraging for food, water and propolis, defence, disease and the survival of the bees through the winter.	Thorne Tel: 016973 858555 *sales@thorne.co.uk*
Secrets of the Beehive A cut out and colour teaching aide of children. It shows the life history of the honeybee from egg to foraging worker. A4 size produced on stiff art card, brass fastener provided.	Thorne Tel: 016973 858555 *sales@thorne.co.uk*
Wall charts: e.g. Bees; Honey Bees; Pollen in Honey	Thorne Tel: 016973 858555 *sales@thorne.co.uk*
Recipes using honey: e.g. Honey &cinnamon biscuits; carrot, honey and sultana squares	***'Keeping Bees' : a complete practical guide*** Paul Peacock www.octopusbooks.co.uk ISBN: 978-0-7537-1985-5