

Making your classroom buzz with Bee-Bots: Ideas and Activities for the Early Phase



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Welcome to the ICT Learning Innovation Centre's Guide to using Bee-Bots in the Early Phase. This resource has been developed to help teachers make Bee-Bots integral to learning in Early Phase Classrooms. The learning experiences that are featured in this guide have been developed as a result of research and trials undertaken at our centre. As you will see, these experiences can be used to assist students to develop skills, knowledge and processes within the Early Years Curriculum and from Essential Learnings across the KLAs.

Within this guide, there are references to downloadable resources that we have created to help teachers get started. These resources are all available for download from the Bee-Bots section of the Interactive Learning in the Early Phase website at www.earlyphaseicts.com.

We encourage you to visit this site to download the resources and to learn more about the different ways ICT can be made integral to learning in the Early Phase. From time to time, this site also contains information about upcoming conferences and professional development events held at our centre.



If you have any feedback about this guide or would like to share your own Bee-Bot ideas or resources, please email our Project Officer Kristine Kopelke at kristine@eq.edu.au.

For further information about the ICT Learning Innovation Centre, visit our website at <http://www.learningplace.com.au/ea/licsunshinecoast>.

Bee-Bot Links

The following websites provide further information and resources relating to Bee-Bots.

Bee-Bot Official Website
www.bee-bot.co.uk

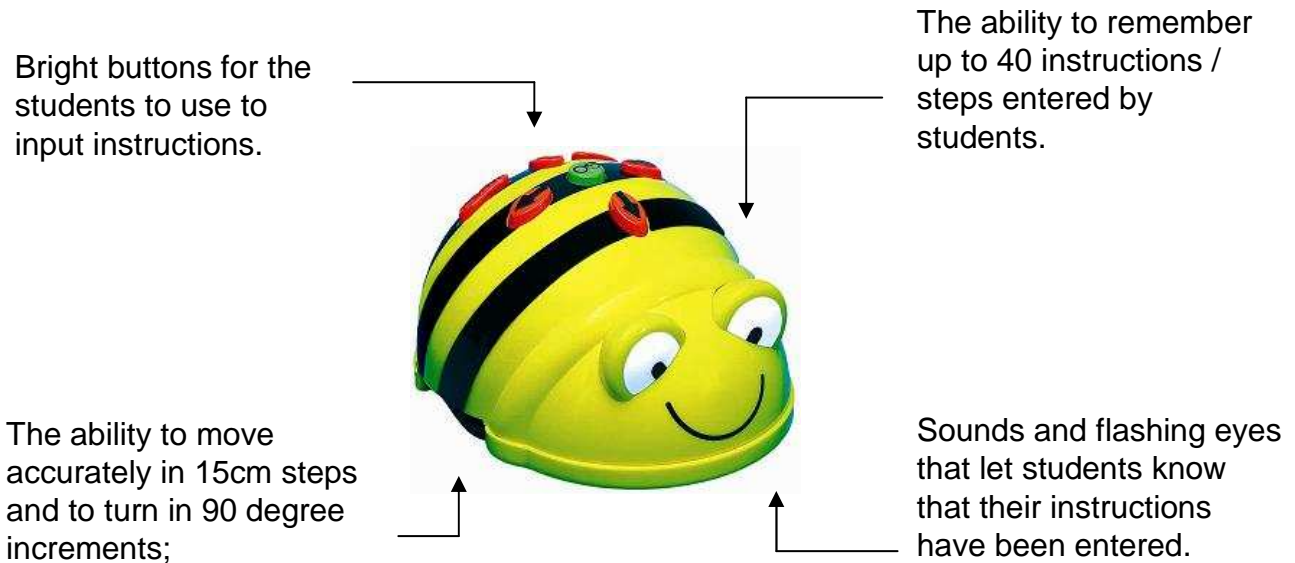
Bee-Bots Down Under Blog
<http://bee-bots-downunder.blogspot.com>

Educational Experience – Australian Bee-Bots Supplier
www.edex.com.au



What are Bee-Bots?

Bee-Bots are programmable floor robots that have been purpose-built for use with Early Phase and Primary students. The following diagram highlights the features of the Bee-Bot.



Bee-Bots have a friendly and happy design that appeals to young learners (and teachers!). They can move on any flat surface and can also move up slight inclines. Surfaces we have tested the Bee-Bot on include carpet, tiles, concrete, plastic, cardboard and wood. We found that the Bee-Bot had no problems moving on these surfaces.

There are a range of accessories that you can purchase to use with your Bee-Bots. These accessories include clip-on shells that you can use to give your Bee-Bot a makeover and mats relating to a number of common Early Phase learning contexts.

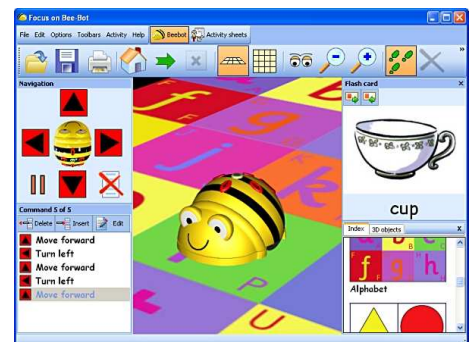
This guide has tried to provide ideas for using both commercial and DIY Bee-Bot accessories.

Focus on Bee-Bot Software

Within the Bee-Bot range, there is also the Focus on Bee-Bot software application. You don't need to have this software to use your Bee-Bot and you don't need a Bee-Bot to use this software. This software provides a virtual version of Bee-Bot learning experiences.

Within the software, you can program a virtual Bee-Bot to move around a mat. The program allows users to watch the movements from a range of angles including the perspective of the moving Bee-Bot. The software also allows the user to add virtual 3D objects to the mats. It is great to use in conjunction with an interactive white board.

A free 14 day trial of the Focus on Bee-Bot software is available for download from <http://www.bee-bot.co.uk>.



Making your own Bee-Bot Mats

Most teachers who use Bee-Bots end up wanting to create their own mats to use with them. Transparent mats are commercially available and can be placed over mats you have made. These are great to use as the Bee-Bot needs a smooth surface to move on. This is particularly important if your mat contains materials or pictures glued to the surface. A transparent mat can sit over this and prevent the Bee-Bot from becoming stuck on or damaging the mat.

If the mat you wish to make simply contains drawings, text or images, you may find that a piece of cardboard or butchers paper is sufficient.



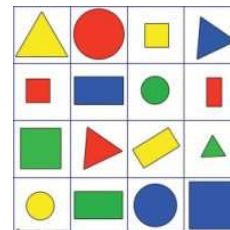
The following tips may help if you are planning on creating your own mats:

- Mats can be any size, however each square on the mat should be 15cm x 15cm as the Bee-Bot can only move in 15cm increments.
- The grids on the transparent mats are 4 x 4. If making a mat to go under a transparent mat, your mat will need to be 60cm x 60cm. When the transparent mat is overlaid it will divide your mat into 16 squares, with each square being 15cm x 15cm.

Commercial Mats

A range of commercial mats are available for purchase in Australia. These mats cover a range of topics and concepts and are made from durable plastic.

Popular mats include the alphabet mat, the Treasure Island mat, the Busy Street mat and the transparent mat.



Naming your Bee-Bot

Giving your Bee-Bot a name is just all part of the fun. Our centre Bee-Bots have all been given names that begin with the letter B. We've got Buzz, Bart, Boris, Blinky, Bindi, Bonnie, Blitzen and a number of other bots.

We thought our Bee-Bot names were pretty cute, until we heard the names that a Year 10 class at Bentley Park College in Cairns gave their Bee-Bots. Their Bee-Bot swarm includes 2Bee, 2not2bee, Maybee, Letitbee, Wallabee and Billbee. The class and their teacher Kate Maccoll spent a term exploring the different ways that Bee-Bots could be programmed and designed a range of activities to trial with a Year One class at a local school.

Ideas for using Bee-Bots in the Early Phase

Synchronised Buzzing

Bee-Bots love buzzing together. In this activity, students work collaboratively to develop a flight plan for their Bee-Bot. They may draw the path on paper, write down a sequence of instructions or use the Bee-Bot button sequence cards to map out what they want their Bee-Bots to do. Once the students have developed their flight plan, they can program their Bee-Bots and then press go at the same time to see some synchronised buzzing.

Bee-Bot Barrier Games

Barrier games are a great strategy to use to develop students oral language skills. For this activity, you will need two identical mats, a board or a divider and two Bee-Bots. To try this activity in your class, students place a Bee-Bot and a mat on each side of the divider. On one side of the divider a student or team of students decides the location on the mat where the Bee-Bot will be to start with. They then tell the other student or team on the other side of the divider. The student or team that is providing instructions, then programs their Bee-Bot and provides the other student or team with instructions so that they can move to the same spot. The goal is for each student or team to help their Bee-Bot make it to the same location on the mat. Once all instructions are given, students check if the locations match and if so win the game.

I think I can.... I think I can... The Little Bee-Bot that could.

You may have noticed that every Bee-Bot has a tow bar on their back. You can attach string or rope to the tow bar in order to have the Bee-Bot tow other objects. In this activity, students can investigate the different loads that Bee-Bots can tow and how the weight of the loads can effect the speed of the Bee-Bot. Students can also try placing the Bee-Bot on surfaces placed at different angles to see if the Bee-Bot can carry the load up or down a slope.

Teachers may use the text 'The Little Engine that Could' as a stimulus for this activity. Students could then collaboratively develop a class big book of their own innovation on this text titled 'The Little Bee-Bot that could'. Illustrations could include digital photographs of the students experimenting with different loads.



Groovy Bots

Turn up the music in your class and get your Bee-Bots and students moving. Challenge students to program the Bee-Bots to dance to the music. Invent some names for the dance steps they create. Students could also work collaboratively to make the Bee-Bots dance in sequence.

How far is it?

In this activity, students work collaboratively to explore how far it is that a Bee-Bot can travel with each step. For this activity, students initially explore how concrete materials can be used as non-standard units of measure. For example, students may estimate and then investigate how many paperclips are needed to represent how far a Bee-Bot moves with each step. Alternatively they may measure the length using a range of other materials such as counters, blocks and matchsticks.



A key part of this activity is the discussion that should take place during the culminating stage. During this discussion, students should be asked to share their findings and can make comparisons relating to the types of non-standard units they used. For example, the students might have discovered that a Bee-Bot moves the length of six paperclips or four blocks. Depending on the level of the students in the class, this can then provide a starting point to explore standard units of measure and the use of rulers and measuring tapes.

Bee-Bot Trails

For this activity, take your class outdoors onto a surface where they can do chalk drawings. Divide students into groups of two or three and then give each group a Bee-Bot, some chalk and either a tape measure, ruler or concrete materials they can use as non-standard units. Model the process of designing a Bee-Bot trail, emphasising the importance of measuring the trail to ensure the Bee-Bot can reach and turn at particular points.

Ask each group to design a trail that the Bee-Bot can buzz along. Once students have designed their trail, they should test it and then ask other students to get their Bee-Bot to buzz along their trail. During this final part, students will need to work together to estimate how many steps they will need the Bee-Bot to take.



Bee-Bot Rulers

To provide students with a way of measuring how far the Bee-Bot moves with each step, you may want to make a collection of Bee-Bot Rulers for students to use. These are useful to use with younger students who are not ready to use standard rulers or measuring tapes.

A template for a Bee-Bot ruler is available for download on our Early Phase website at www.earlyphaseicts.com.



Rhyme Time

Listening to and repeating nursery rhymes aids the development of early phonemic awareness and for this reason are part of many Early Phase classes daily routines.

Bee-Bot mats can be developed around the theme of nursery rhymes. For example, a mat could be created that features a collection of pictures that each represent a nursery rhyme. Students could then be asked to make the Bee-Bot move to the rhyme they would like the class to sing. Alternatively, mats could be developed for individual rhymes and students could program the Bee-Bot to move to the rhyme. Suggested rhymes that would make great mats include 'Hickory Dickory Dock', 'Jack and Jill' and 'Incy Wincy Spider'.



How many Bs can we use with Bee-Bot?

Even the youngest students enjoy exploring alliteration – the repetition of a leading vowel or consonant sound in a phrase. The Bee-Bot name is so catchy because of alliteration and students will enjoy working together to collaboratively develop their own phrases and sentences about Bee-Bots. Examples could include 'Bindy Bee-Bot bakes bread for breakfast' or 'Bonnie Bee-Bot broke Blinky Bee-Bots bright blue balloon'.

Slalom Buzzing

Challenge your students to a Slalom Buzzing race. You can design your own slalom buzzing course around your classroom or have students create their own using either flags they have created using straws, paddlepop sticks and cardboard. Alternatively, for a permanent course, draw your own flags or print out our flag template and then use clear contact to stick them to the classroom floor. In slalom skiing, flags generally alternate between red and blue for each gate. It is recommended that flags are numbered so that the course is clear.



Turn this activity into a game by either developing rules or collaboratively brainstorming rules with your class. For example, each student or group could get three attempts to program their Bee-Bot to buzz through the course. They could earn 5 points for each gate they pass through in attempt 1, 2 points for each gate in attempt 2 and 1 point for each gate in attempt 3. The winning team is the team with the most points.

Bee-Bots Day Out

In this activity, students will program their Bee-Bot to make their way to different locations on the Bee-Bot Busy Street mat. This mat is one of the official Bee-Bot mats that you can purchase to use with your Bee-Bot.



The Bee-Bots Day Out activity can be played in a range of ways. For example, you could provide the class with a shopping list of things the Bee-Bot needs to pick up. The class could then discuss where you would purchase each item.

Alternatively, students could develop clues relating to the different locations within the street. For example, a clue might be 'Blinky Bee-Bot needs to buy some bananas but he needs to get some money out from the ATM first. Help Blinky get to the bank and then program him to visit the shop where he can buy some bananas'.

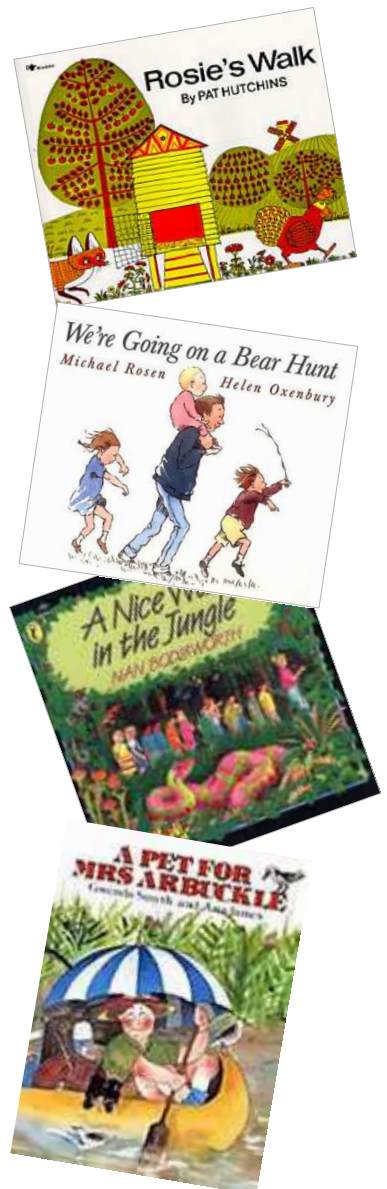
Bee-Bots Walk

This activity involves the class creating an innovation of the text 'Rosie's Walk' by Pat Hutchins. To begin this activity, the teacher reads 'Rosie's Walk' to the class.

This text involves Rosie the Hen going for a walk through the farmyard, the whole time not realising that she is being followed by a fox. After reading the book, the class engages in a joint construction of a Bee-Bot mat that includes the different locations in the farmyard that Rosie visits. Once completed, the teacher reveals two Bee-Bots that have been dressed as Rosie the Hen and the fox. Students then collaboratively retell the story and sequence the moves the Bee-Bots will need to make to follow the same path that Rosie and the fox followed. Once programmed the students place the Bee-Bots on the mat and see if they follow the path correctly.

This activity can be a stimulus for other similar activities. For example, students could write a text titled 'Bee-Bots Walk' or create mats relating to other popular children's texts that include journeys. Other recommended texts for this activity include:

We're Going on a Bear Hunt – M.Rosen and H.Oxenbury
A Nice Walk in the Jungle – Nan Bodsworth
Possum Magic – Mem Fox and Julie Vivas
Gandali the Whale – Meredith Hooper and Anita Mertzlin
A Pet for Mrs Arbuckle – Gwenda Smyth



B-Tunes

Bee-Bots love moving to music and they especially love moving to the sounds of early phase students singing. As a group, collaboratively develop your own B-Tunes and then have students program their Bee-Bots to dance to the sound. You could even use audacity to capture the songs created by students.

Check out these B-Tunes we've created to get you started.

I'm a Little Bee-Bot,
Yellow and round,
Here are my buttons,
This is my sound.
When I get all programmed, I'm ready to go.
So press my green button and watch me go.



Bee-Bot, Bee-Bot turn around.
Bee-Bot, Bee-Bot make a sound.
Bee-Bot, Bee-Bot turn left and right.
Bee-Bot, Bee-Bot blink your lights.

One little, two little, three little Bee-Bots.
Four little, five little, six little Bee-Bots.
Seven little, eight little, nine little Bee-Bots
Ten little Bee-Bot floor robots.

Make a Bee-Bot Course

Provide students with a range of concrete materials such as blocks, boxes and manipulatives and ask students to design a Bee-Bot obstacle course. Students can use rulers or non-standard units of measure to create the course and will need to plan their course to ensure the Bee-Bot can move safely through it. Once completed, students can challenge other students to program Bee-Bots to move through the course.



Bee-Bot Extreme Makeovers

Whilst the Bee-Bots are very cute in their bee state, they can be given a makeover to become lots of other characters. Ask students to work collaboratively to brainstorm ideas for new creatures, characters or things that the Bee-Bots could be turned into. Provide students with a range of collage materials and some Bee-Bot shells and watch as the imaginations of your students come to life and your Bee-Bots get an extreme makeover.



Next Generation Bee-Bots

This activity is designed to engage students in discussion about positional and directional language. The activity begins by providing the students with the following scenario:

‘The creators of the Bee-Bot have decided they want to make a new Bee-Bot that is even better. One suggestion they have had is that the new robot should be able to be told what to do using a students voice rather than by pressing buttons. Do you think this is a good idea? And if so, what words or sentences would the Bee-Bot need to understand to be able to follow these directions?’

Once this scenario has been posed, engage students in a joint construction of a concept map containing all the different words and sentences the Bee-Bot would need to know. Use a concept mapping tool such as Kidspiration to create the concept map digitally or if unavailable, simply use cardboard or paper. Once completed, display the concept map in the room. Encourage students to experiment with the different words and sentences when using the Bee-Bots and providing other students with instructions.

Words could include:

forward, backwards, up, down, around, right, left, under, over, through, beside, next to, wait, pause, move, go, turn, rotate, 360 degrees, face, direction etc.

Bee-Bot Number Hives

Exploring different ways that numbers can be represented is a core focus of early number activities. As a result, we’ve developed a template that you can print out to create your own mats that feature the numbers 1-10 in concrete, verbal and symbolic representations. The template features these representations within the context of bee hives. Once you’ve printed and combined the individual mat pieces into your own mat, you can use the mat to play a number of games.

One example would be to have students select a card and then have them move the Bee-Bot to a representation that matches the number of the card. Alternatively, you could use spinners or dice to determine the original number.



Bot-Detectives

'What am I?' texts form a valuable part of literacy development in many early phase classrooms.

In this activity, students work collaboratively to develop a series of clues relating to a collection of pictures that have been placed on a mat. For example, the mat may contain photographs of animals taken during a class excursion to the zoo.

Students write their clues onto the cards and then place these in a class set to accompany the mat. To play the game, a student is asked to select a card. The student or class then read the clue and the student programs the Bee-Bot to move to the animal the clues relate to.

What am I?

I have wings, a thorax and an abdomen. I began my life as a caterpillar.

Clue by Mia.



Ladybug Lunch

Ladybugs are our friends in the garden as they love to munch on aphids, mealybugs and mites. In this activity, students create a mat using either real leaves, photos or rubbings of leaves they have found in their school or home environments. Students then design a card with a clue that tells the Bee-Bot (dressed as a ladybug) which leaf to go to for lunch. For example, clues might be 'A delicious dish of aphids can be found on the small round leaf' or 'Mealybugs are on the dark green leaf'.

Clues created by students can form a class collection that can be drawn from during the game. Students then draw a card, read the clue and program their ladybug Bee-Bot to move to that position on the mat.



Creating a home for our Bee-Bots

In this activity, the Bee-Bot is used as a stimulus to explore the concept of habitats. Students are posed the question 'Where would Bee-Bots live if they were out in the wild rather than in our classroom?' This question is designed to stimulate discussion around the concept of habitats and as part of this activity, students can share existing knowledge about the habitats of real living things.

Students can then work together in small groups to collaboratively build a home (or habitat) for the class Bee-Bots in a corner of the classroom.

Guess who?

In this activity, a mat is made containing a photo or drawing of each student in the class. The teacher then picks a student name and proceeds to give the class clues relating to that student. Each time a clue is given, a student is selected to come and program the Bee-Bot to move to the location of the student the student thinks is correct. If correct, that student and the class wins. If incorrect, the game continues until the number of guesses the teacher sets is met or a student moves the Bee-Bot to the correct location.

Clues the teacher provides could include 'I am a girl / boy', 'I have short hair', 'I wear glasses', 'I like swimming' etc. This activity also could be done with photos or drawings of members of the school or local community, animals or famous characters. Clues can relate to physical appearance, the role the person takes on within a community or how they move or act.

Turtle Island

To play this game, use one of the green Bee-Bot shells and some collage materials to transform your Bee-Bot into a turtle. Using either the Bee-Bot Treasure Island Mat or a mat of an island you have made, ask a student to write down the coordinates for the grid location where the turtle has laid its eggs. Ensure that other students don't see the coordinates.

Students are then invited to come up and guess the location of the eggs. They must identify the location by pointing to the spot and saying the coordinates. The student then programs the Bee-Bot to move to that location. Once the turtle arrives at the location, the first students must reveal if the spot is where the eggs were laid. If it is, the student wins the game. Students keep having turns until the eggs are found. To help younger students locate the eggs, the first student or the teacher may provide hot and cold style hints during the game.



Bee, Bee, Bee-Bot Bee

Make a mat containing the names of each member of your class. Select a student to come up and program the Bee-Bot to move to their own name. As a class sing the following song as the Bee-Bot moves.

Bee, Bee, Bee-Bot Bee
Can you find my name for me?



Pollen Hunt

Bees love collecting pollen and in this game, Bee-Bots do too. To create this game, you will need to create a collection of flower pots and small tokens that will represent the pollen.

In this game, you or the students set up the flower pots on the floor. Attach numbers on pieces of card to the flower pots. These numbers will represent the number of pollen pieces that the student will earn if they reach the pot.

To play the game, a student programs the Bee-Bot to move through the 'garden' visiting as many flower pots as possible. If a player hits or knocks over a pot, they receive the amount of pollen indicated on the card attached to the pot.

Each student gets two turns, with the flower pots being set up again between each turn.



The winner of the game is the student with the most pollen at the end. For older students, the game can be adapted to increase the complexity. For example, the players could be asked to program the Bee-Bot to visit flowerpots in a particular order. e.g. counting in twos or fives, odd or even numbers etc. The cards attached could even contain words with the students having to try to program the Bee-Bot to visit the flower pots in a particular sequence that makes a sentence.

For more information or ideas, buzz on over the Interactive Learning in the Early Phase website at www.earlyphaseicts.com.

