

**CODE/MOE/UOIT Makerspaces Project--Lesson Planning Template**

**School Board: GECDSB**

**Grade(s): Early Years**

**Subject(s): BC, SRWB, DLMB, PSI**

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| **BIG IDEAS:** Introduce the concept of coding a sequence of movements using arrow commands on a BeeBot.**Curriculum Expectations:****OVERALL:**1. communicate with others in a variety of ways, for a variety of purposes, and in a variety of contexts (BC, SRWB, DLMB, PSI)

4. demonstrate an ability to use problem-solving skills in a variety of contexts, including social contexts (BC, SRWB, PSI)10. demonstrate literacy behaviours that enable beginning writers to communicate with others (DLMB)15. demonstrate an understanding of numbers, using concrete materials to explore and investigate counting, quantity, and number relationships (DLMB)**SPECIFIC:** **1.2** listen and respond to others, both verbally and non-verbally (e.g., using the arts, using signs, using gestures and body language), for a variety of purposes (e.g., to exchange ideas, express feelings, offer opinions) and in a variety of contexts (e.g., after read-alouds and shared reading or writing experiences; while solving a class math problem; in imaginary or exploratory play; in the learning areas; while engaged in games and outdoor play; while making scientific observations of plants and animals outdoors)**BC, PSI****1.6** use language (verbal and non-verbal communication) to communicate their thinking, to reflect, and to solve problems **SRWB, DLMB** **4.1** use a variety of strategies to solve problems, including problems arising in social situations (e.g., trial and error, checking and guessing, cross-checking – looking ahead and back to find material to add or remove) **SRWB, BC, PSI****10.2** demonstrate an awareness that text can convey ideas or messages *(e.g., ask the educator to write out new words for them)* **DLMB** **10.3** write simple messages *(e.g., a grocery list on unlined paper, a greeting card made on a computer, labels for a block or sand construction)*, using a combination of pictures, symbols, knowledge of the correspondence between letters and sounds (phonics), and familiar words **DLMB****15.3** make use of one-to-one correspondence in counting objects and matching groups of objects **DLMB** |
| **Learning Goals:**“We are learning to…”* read block coding
* predict where the code sends us
* design code that meets a specific challenge
 | **Success Criteria:** “We will be successful when we…”* move the BeeBots along the path shown in the block code
* guess where we will come out of the grid
* can pick a spot on the grid that we want to get to and make a code to do it
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| **Lesson Overview:**During a whole group circle introduce the BeeBot, talk about how to use and take care of them and do a few short demos with the BeeBots. During play work with small groups to code the BeeBots. |
| **Materials and Technology:** * Large carpet area
* 2 BeeBots
* whiteboard grid
* small arrow cards (straight, right, left)
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| **Student Accommodations/Modifications:** * Time to freely explore BeeBots before trying challenges.
 | **Lesson will be differentiated by:*** lesson will be open enough to allow multiple entry points to making a simple code.
* use of arrows allows students with limited language and ELLs to participate.
* students will be supported in designing code and moving through the grid.
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| **MINDS ON: Getting Started** |
| During this phase, the teacher may: • activate students’ prior knowledge; • engage students by posing thought-provoking questions; • gather diagnostic and/or formative assessment data through observation and questioning; • discuss and clarify the task(s).  | During this phase, students may: • participate in discussions; • propose strategies; • question the teacher and their classmates; • make connections to and reflect on prior learning.  |
| **Describe how you will introduce the learning activity to your students.** * Whole class sitting at the edge of the carpet. Ask them about what we did in gym the prior day (Coding with large arrows and hula hoop grid, see lesson: Early Years Intro to Coding 1- Phys Ed)
* Share the small card arrows. “This give us the same directions as the big arrows we used in the gym.” Lay out a string of 4-5 arrows and invite a student to hop in the middle of the carpet following the path set by our arrows. Switch it a few times and invite different students to try.
* “Today we are going to use our arrows to move some robots instead of moving ourselves.” Take out one of the BeeBots and put the whiteboard grid in the middle of the carpet. “This is a BeeBot and it has arrows, like ours, right on its back. I’m going to show you how to make them move in a moment. First I want to ask how you think we should take care of a BeeBot?” Lead a discussion about carrying them with two hands, keeping them with the whiteboard grid, pushing the buttons rather than “mashing” them, letting the BeeBot move by itself rather than pushing or pulling it.
* Model how to push the buttons to make it go. “Every time you push the forward or backward button it will move one square on our grid.” Model by pushing forward 2x to show 2 squares move. Bring it back and add a backward. “I can keep adding to my code as long as I don’t push the x. The x will erase my code and I’ll have to start over.” Let the BeeBot go forward 2x and back once. While it moves the teacher should use the directional words to match the BeeBot’s movements. Model how to make it turn and reinforce the idea that a turn will make the BeeBot look at another square but it won’t move unless we give it a forward or backward command.
* Bring out the 2nd BeeBot and invite 2 students to try coding. After they have had a turn, model erasing the code so that another 2 students can try.
* Tell the students that we will have the BeeBots in our room for the next few days and that if they would like to try coding them they can join you on the carpet at the whiteboard grid. “How many do you think would be a good number to have working at the grid at one time?” Establish a number (5-8 works depending on the class) and make it clear that if you don’t go first you will still have the opportunity to work with the BeeBots later. Have the student make a plan for active learning time. (Teacher may need to select the first round of friends for the BeeBots).
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| **ACTION: Working on it** |
| During this phase, the teacher may: • ask probing questions; • clarify misconceptions, as needed, by redirecting students through questioning; • answer students’ questions (but avoid providing a solution to the problem); • observe and assess; • encourage students to represent their thinking concretely and/or pictorially; • encourage students to clarify ideas and to pose questions to other students. | During this phase, students may: • represent their thinking (using numbers, pictures, words, manipulatives, actions, etc.); • participate actively in whole group, small group, or independent settings; • explain their thinking to the teacher and their classmates; • explore and develop strategies and concepts.  |
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| **Describe the task(s) in which your students will be engaged.** * in small groups (4-6), let each student explore making the BeeBot move on the grid (a simple code of 5-8, have them reset, try another).
* “Get to the…”
* once each has had their turn split the group so half are at either end of the grid. Use a dry erase to mark a starting square on the edge closest to them. Have each group draw a circle in another square on the grid. “Can you make the BeeBot stop on your circle (or any symbol)?” Observe how they work through the challenge and what kind of language the use. Are they using directional words? Do they count the squares on the grid to help them press the right number of arrows? Do they use trial and error to get close? Once the students have made it, the teacher can challenge another student to try to get to the same spot but on a different path.
* “Deal a Code”
* using small arrow cards, the teacher (or student) can deal out a string of code. Start with a short code (3-4 cards) and build up to longer. The challenge for the students is to predict where the BeeBot will stop. Students can use a dry erase marker to put their name in the square they predict the BeeBot will stop. Have students work in pairs to program the BeeBot with one student reading the arrow cards to the other student who pushes the buttons. Did it stop where you thought? Why or why not?
* “Write the Code to Get to the…”
* similar to the first challenge except this time the students need to use the arrow cards to show the code they think will get them to the designated square on the grid. The teacher can show the students (if they haven’t already done it themselves) how placing the arrow cards on the grid can help them visualize and track the movements in their code. Once they have it written they can program the BeeBot to test it. If it doesn’t work, it opens up the discussion on what to add, take away, change, etc.

**What misconceptions or difficulties do you think they might experience?** * unrelated to tech, they may have trouble taking turns. If they cannot work it out themselves the teacher may need to establish roles in the small group/partnership that the students can work through.
* understanding that the turn arrows only rotate the BeeBot 90 degrees but doesn’t advance a square.

**How will they demonstrate their understanding of the concept?*** they can create a simple code with the arrow cards and predict where the BeeBot will go
* they are able to code a BeeBot to move from a start and end point.

**How will you gather your assessment data (e.g., checklist, anecdotal records)?*** take photos and add anecdotal comments later
* make a Learning Story for student
* start a Document Panel around coding and robotics

**What extension activities will you provide?** * students will have access to the BeeBots over the next few days. Encourage them to create new challenges/games for their peers to try
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| **CONSOLIDATION: Reflecting and Connecting** |
| During this phase, the teacher may: • bring students back together to share and analyse strategies; • encourage students to explain a variety of learning strategies; • ask students to defend their procedures and justify their answers; • clarify misunderstandings; • relate strategies and solutions to similar types of problems in order to help students generalize concepts; • summarize the discussion and emphasize key points or concepts.  | During this phase, students may: • share their findings; • use a variety of concrete, pictorial, and numerical representations to demonstrate their understandings; • justify and explain their thinking; • reflect on their learning. |
| * Sharing Circle
* at the end of each day with the BeeBots have a few students that worked with them share with the class what they did (demo a string of code, explain a new game/challenge they made up
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