

**CODE/MOE/UOIT Makerspaces Project**

**School Board: Wellington Catholic District School Board**

**Grade(s): 2-3**

**Subject(s): Mathematics--Coding**

|  |  |
| --- | --- |
| **BIG IDEAS:**  **Students can use estimation, measurement and standard units to design and build a maze. Students can challenge others to guide their Bee Bot through the design, recording the movements.**  **Curriculum Expectations:**  **OVERALL:**  -estimate, measure and record lengths using standard units;  - demonstrate an understanding of magnitude by counting forward and backwards by various numbers and from various starting points.  **SPECIFIC:**  **-**estimate, measure and record lengths using standard units (i.e., centimetre, metre, kilometre);  - count forward by 1’s, 2’s, 5’s 10’s and 100’s to 1000 from various starting points, and by 25’s to 1000 starting from multiples of 25, using a variety of tools and strategies. | |
| **Learning Goals:**  **“We are learning to…”**  -code with BeeBots and complete challenges with a group. | **Success Criteria:**  **“We will be successful when…”**  -we can complete the challenge. |
| **Lesson Overview:**  -several mazes will be created for students to code their BeeBot through. | |
| **Materials and Technology:**  -Bee Bots  - tape or portable obstacles (i.e.; linking cubes)  -paper/pencils to record information | |
| **Student Accommodations/Modifications:**   * **Reduce the number of challenges that students have to perform** | **Lesson will be differentiated by:**   * **Content, specifically:** * **Process, specifically:** * **Product, specifically:** * **Environment, specifically:** |
| **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.**   * Show students the Bee Bots and how to code the robots.   **What key questions will you ask?**  What would you do if you and your friends had to find your way out of a maze? What strategies would you use? What if you had a bird’s eye view of the maze; would this help you find your way out?  **How will you gather diagnostic or formative data about the students’ current levels of understanding?**   * Exit cards * Brief quizzes * Thumbs up/ thumbs down to teacher prompted questions   **How will students be grouped? How will materials be distributed?**   * Students will be grouped randomly. * One student from each group will be responsible for collecting materials needed from the bins, and another will have to return it when the task is over. | |
| **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. |
| **Describe the task(s) in which your students will be engaged.**  -using tape or linking cubes, students will work in groups to make a maze wide enough for a Bee Bot to fit through.  -the group must determine the correct code for the Bee Bot to successfully make it through their maze.  - rotate groups and have groups try other mazes.  -encourage students to share the Bee Bot and share the responsibilities of coding the device.  **What misconceptions or difficulties do you think they might experience?**   * Programming the Bee Bot to follow the correct path they want * Sharing the responsibilities of the task   **How will they demonstrate their understanding of the concept?**   * Students will explain how they get through the maze by following the code they copied on their paper. They will also communicate any challenges they had and how they problem solved to re-direct their robot.   **How will you gather your assessment data (e.g., checklist, anecdotal records)?**  -checklists  -teacher observations/conversations  **What extension activities will you provide?**   * Using the code that was created, use those numbers to print whole numbers * Compose three digit numbers with the code and talk about place value | |
| **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. |
| **How will you select the individual students or groups of students who are to share their work with the class (i.e., to demonstrate a variety of strategies, to show different types of representations, to illustrate a key concept)?**  -based on observation/conversations with groups.  **What key questions will you ask during the debriefing?**  **-** what parts of the challenge did you find most challenging/easy?  - when faced with a challenge, how did you and your group problem solve?  - what could you do to make the task more challenging? | |