

**CODE/MOE/UOIT Makerspaces Project**

**Lesson Plan: Grade 3 Mathematics:**

**Measurement & Data Management**

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| **BIG IDEAS:****We need to select the most appropriate unit when measuring length.****We need to select the most appropriate scale when creating a bar graph.****Specific Curriculum Expectations: Grade 3**Measurement: Estimate, measure and record length, height and distance, using standard units (i.e., millimetre, centimetre, metre).Data Management: Collect and organize categorical or discrete primary data and display the data in charts, tables, and graphs with appropriate titles and labels and with labels ordered appropriately along horizontal axes, as needed, using many to one correspondence. |
| **Learning Goals:**“We are learning to…”learn how to collect measurement data after 3 attempts and display it in a bar graph. | **Success Criteria:** “We will be successful when…”we can collect and display our data clearly in a bar graph;we select the best linear unit for our measurements;we select the most appropriate scale for our graph. |
| **Lesson Overview:****Students will code Dash to reach a target. Students will measure the distance away from the desired target. Revision of the code and displaying the data will show students the importance of a growth mindset.** |
| **Materials and Technology:** DashIPad or similar coding device (with Blockly app)Tape or object to mark a starting point and targetGraph paperPencilsColouring PencilsRuler |
| **Student Accommodations/Modifications:**  | **Lesson will be differentiated by:*** **Content, specifically: to make the task easier the target could be 4 square tiles on the floor; to make it more challenging, the target could be on top of a piece of tape**
* **Process, specifically: partners as support; more time;**
* **Product, specifically:**
* **Environment, specifically:**
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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. What key questions will you ask? How will you gather diagnostic or formative data about the students’ current levels of understanding? How will students be grouped? How will materials be distributed? **This activity can be a summative measurement and data management task, assessed by a rubric or checklist.****Each student/ pair will require one iPad and one Dash.** |
| **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. What misconceptions or difficulties do you think they might experience? How will they demonstrate their understanding of the concept? How will you gather your assessment data (e.g., checklist, anecdotal records)? What extension activities will you provide? Indicate on the floor a starting point and a target for Dash to travel to.Write a code using Blockly that you think will move Dash from the starting point to the intended target.Run the code and observe where Dash goes. Measure a direct line from the target to where Dash actually ended up. Record this distance and call it Attempt #1.Revise the code, run it, observe and measure. Record this distance and call it Attempt #2.Create a graph to correctly and appropriately display the collected data. Extensions: Require the course to be more complicated. Eg. specific length, rotation, etc. |
| **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)? What key questions will you ask during the debriefing? Students who used different scales on their graphs might be asked to explain their choice of scale.Students whose coding improved and the measurement distances decreased each time might be asked to share their strategies. |