

**CODE/MOE/UOIT Makerspaces Project**

**Lesson Plan: Grade 3 Mathematics: Measurement**

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| **BIG IDEAS:**  **We can describe shapes by their geometric properties (eg. angle size).**  **We can select and measure with the most appropriate linear units.**  **The smaller the unit (eg. cm, mm) the more specific and accurate we can be with our measurement.**  **Mathematics Specific Curriculum Expectations:**  Compare various angles using concrete materials and pictorial representations and describe angles as bigger than, smaller than, or about the same as other angles;  Estimate, measure and record length, height and distance, using standard units (i.e., millimetre, centimetre, metre). | |
| **Learning Goals:**  “We are learning to…”  **identify angles as right angles, greater than or less than a right angle;**  **we are learning to measure with accuracy using units that are appropriate.** | **Success Criteria:**  “We will be successful when…”  **we can use a reference tool to find a right angle, an angle larger than a right angle and an angle smaller than a right angle;**  **we can use both metres and centimetres to measure our course.** |
| **Lesson Overview:**  **Create a course for Dash that includes geometric properties (angles) and specific course length.** | |
| **Materials and Technology:**  Masking Tape  Dash  IPad or similar device to write code for Dash (with Blockly app) | |
| **Student Accommodations/Modifications:** | **Lesson will be differentiated by:**   * **Content, specifically: change the course requirements if needed; measure with non-standard units** * **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. 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?  **Prior knowledge of angles is required from previous lessons. Perhaps take your class on an angle hunt using a post-it note as a reference tool to identify right angles, etc.**  **Questions: How might this tool be helpful to us? How can it help us determine if an angle is greater than a right angle? less than a right angle?**  **Grouping - groups of 2-3 students**  **Determine the number of Dash robots your school has. Rotations of other activities may be required to make the sharing of materials manageable.** | |
| **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?  Task:  Design a course for Dash to travel through.  The course must be between 2m and 3m in length.  Your course must also contain:   * One right angle * One angle greater than a right angle * One angle that is smaller than a right angle   Then, write the code for Dash to travel through the course that you created.  Observe student demonstration of construction of their course.  Checklist for course requirements  Interview for accuracy of course requirements  Anecdotal records of learning skills demonstrated.  Extension: different requirements for the course based on grade level geometry/measurement expectations  Create a course that requires a pattern in your written code.   * Extend to higher grades by being more specific with measuring angles * Use a variety of linear measurement units (eg. dm, mm, cm, m) * Be more specific with course criteria (eg. one leg of the course must be exactly 3 dm in length) | |
| **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 show innovation or competence using a reference tool may be asked to share their angle measurement strategy.  How did this tool help you be successful in meeting the success criteria? | |