

**Makerspace Project CODE/MOE/UOIT**

**Lesson Plan : Grade 5 Mathematics : Sphero Angles**

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| **Curriculum Overall Expectations:**   * Compare angles by superimposing them or using a marker object (eg, this angle has a larger aperture than the corner of a sheet or smaller aperture than the space between the fingers [index and middle finger]) * Identify, measure, and use right angles as the reference angle to compare other angles * Estimate the measurement of acute and obtuse angles and measure them with a protractor * Construct a given measurement angles using a protractor and a ruler * Demonstrate the congruence of figures as a function of measurements of their sides and angles, using a protractor and a ruler, or software. * Identify, describe and classify the triangles (rectangle, acute, obtuse and equilateral) from the angles. * Construct and plot, using a protractor and a ruler, different representations of triangles from measurements of given angles or sides   (Square, rectangle, rhombus, parallelogram, trapezoid, kite) according to their common and distinct properties (example: axes of symmetry, sides of the same length, parallel sides, diagonals, angles). | |
| **Learning Goals:**  “We are learning to…”  Program the Spheros in order to :  - compare angles  - identify types of angles  - estimate measuring angles  - construct angles  - identify, classify and make quadrilaterals  - identify, classify and make triangles | **Success Criteria:**  “We will have success when we can …”  - Make an acute, obtuse, and right angle based on the protractor that is available in the Sphero program  **-** Make an acute, obtuse, and right angle with tape on the floor, and program the Sphero to follow drawn lines  **-** Make and identify an obtusangle triangle, an acutangle triangle, and a rectangle  **-** Make and identify equilateral, isosceles, and scalene triangles  **-** Make various geometric forms (square, rectangle, trapezoid, diamond) |
| **Lesson Overview:**  **1st lesson :**  Presentation on programming  Exploration of the Spheros and programming in small groups  **2nd lesson :**  Production of acute, obtuse, and right angles with tape as a guide  **3rd lesson :**  Productionof various triangles (obtusangle, acutangle, rectangle, scalene, equilateral, isosceles**)**  **4th lesson :**  Production of polygons (square, rectangle, trapezoid, diamond, parallelogram) | |
| **Materials and technology to be used :**  - iPads  - Spheros  - Coloured tape  - LongExpo app | |
| **Accommodations/Modifications:**   * Mixed ability groups * Examples posted (angles, polygones) * Example pages printed and given out | |
| **MINDS ON:** | |
| **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?**   * Presentation to introduce the Spheros, along with a period of free play to explore how programming works with the Spheros * Students had a checklist of tasks to complete on GoogleKeep to guide their learning * Students were grouped in mixed ability groups of 2 to 4 * We used ClassDojo and the LongExpo app to keep proof of learning (videos and photos). The students added captions to the photos to explain what they were doing. | |
| **ACTION:** | |
| **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?**   * Teach students that distance can be measure in seconds, and not just in centimetres (disrupt their learning) * The role of speed * That angles are not always salient (prominent), but students must follow the line on the protractor in the program | |
| **CONSOLIDATION: Reflecting and Connecting** | |
| **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?**   * Show work that has been uploaded to Class Dojo Ask each group to share 1 challenge, 1 success, and one aspect of the project that they liked | |