

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

**School Board: Greater Essex County District School Board**

**Grade(s): 2**

**Subject(s): Math: Geometry and Spatial Sense**

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| **BIG IDEAS:*** applying developing reasoning skills (e.g., pattern recognition, classification) to make and investigate conjectures (e.g., through discussion with others);
* reflecting on and monitoring their thinking to help clarify their understanding as they complete an investigation or solve a problem (e.g., by explaining to others why they think their solution is correct);
* selecting and using a variety of concrete, visual, and electronic learning tools and appropriate computational strategies to investigate mathematical ideas and to solve problems;
* making connections among simple mathematical concepts and procedures, and relating mathematical ideas to situations drawn from everyday contexts
* creating basic representations of simple mathematical ideas (e.g., using concrete materials; physical actions, such as hopping or clapping; pictures; numbers; diagrams; invented symbols), making connections among them, and applying them to solve problems;
* communicating mathematical thinking orally, visually, and in writing, using everyday language, developing mathematical vocabulary, and a variety of representations.

**Curriculum Expectations:****OVERALL:*** **identify two-dimensional shapes and three-dimensional figures and sort and classify them by their geometric properties;**

**SPECIFIC:** * **distinguish between the attributes of an object that are geometric properties (e.g., number of sides,number of faces) and the attributes that are not geometric properties (e.g.,colour,size,texture),using a variety of tools (e.g.,attribute blocks, geometric solids,connecting cubes);**
* **identify and describe various polygons (i.e.,triangles,quadrilaterals,pentagons, hexagons,heptagons,octagons) and sort and classify them by their geometric properties (i.e.,number of sides or number of vertices),using concrete materials and pictorial representations (e.g.,“I put all the figures with five or more vertices in one group,and all the figures with fewer than five vertices in another group.”);**
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| **Learning Goals:**“We are learning to…”Identify, sort and group 2D shapes by their geometric properties | **Success Criteria:** “We will be successful when we…”- identify and count the number of sides and vertices- name the shape |
| **Lesson Overview:****Students will use Ozobots to determine the number of sides and vertices that a variety of 2D shapes have.** |
| **Materials and Technology:** Printed 2D shapesOzobots |
| **Student Accommodations/Modifications:** * **one to one support**
* **smaller number of shapes required to explore**
 | **Lesson will be differentiated by:*** **Content, specifically:**
* **Process, specifically:**
* **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.** Share a picture of a 2D shape. Ask them: how many sides does it have? How many vertices? How do they know? Allow them time to talk to their neighbor. Discuss together as a group. Model using Ozobot to move on the shape and count the sides and vertices.**What key questions will you ask?** What is a side? Vertices?What does the Ozobot do on a side? Vertices? **How will you gather diagnostic or formative data about the students’ current levels of understanding?**Conversations and observations of exploration of 2D shapes. **How will students be grouped? How will materials be distributed?** Groups of 2, sharing an Ozobot and working cooperatively. Ozobots given out by teacher.  |
| **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.** Students will move from shape to shape with the Ozobot and their recording sheet. They will identify the shape, place Ozobot at a beginning point and watch it travel along lines of shape, counting the sides and vertices as it goes. Students record name of shape, drawing of shape and # of sides and # of vertices. **What misconceptions or difficulties do you think they might experience?** Misconceptions – curved lines are sidesDifficulties – remembering where the Ozobot started so they do not double count a side or vertices**How will they demonstrate their understanding of the concept?**By accurately counting the number of sides (straight lines travelled by Ozobot) and the vertices (turns by the Ozobot)**How will you gather your assessment data (e.g., checklist, anecdotal records)?**Anecdotal recordsStudent worksheetChecklist**What extension activities will you provide?** Time for students to explore and create their own shapes with Ozobot. Challenges to create shapes with ex. 6 vertices, or 5 sides etcSorting shapes into groups based on attributes |
| **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)?** Interested students can share a shape they explored and share with the class their findings.Data will be recorded onto co-created anchor chart for further reference.**What key questions will you ask during the debriefing?** How do we know it is a side? How do we know it is a vertex? |