

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

**School Board: Lakehead Public Schools**

**Grade(s): 7/8**

**Subject(s): Science & Mathematics**

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| **BIG IDEAS: Spheros can be used as Easter eggs for the JK/SK’s to do an egg hunt prior to Easter break and as an introduction to the Maker Space.****Curriculum Expectations:****OVERALL: Mathematics** **Grade 7** **-select and use a variety of concrete, visual, and electronic learning tools and appropriate computational strategies to investigate mathematical ideas and to solve problems;** **-make connections among mathematical concepts and procedures, and relate mathematical ideas to situations or phenomena drawn from other contexts;****-report on research into real-life applications of area measurements;****determine the relationships among units and measurable attributes.****Grade 8****-research, describe, and report on applications of volume;****-demonstrate an understanding of the geometric properties of quadrilaterals and circles and the applications of geometric properties in the real world.****SPECIFIC:** **Grade 8 Geography:****- identify the location and describe the physical characteristics of various landforms in the school.****-Grade 7/8 Math:****construct related lines (i.e., parallel; perpendicular; intersecting at 30º,45º, and 60º);****-use estimation when solving problems involving operations with whole numbers, decimals, per cents, integers, and fractions, to help judge the reasonableness of a solution;****-model real-life relationships involving constant rates where the initial condition starts at 0 (e.g., speed of SPHEROS, distance of SPHEROS travel to turn directions, angles of turns);****- research and report on real-life applications of area measurements (e.g., building****- measure the circumference, radius, and diameter of circular objects, using concrete materials and the perimeter, area and volume of shapes and the room.** |
| **Learning Goals:**“We are learning to…” use knowledge of coding of SPHEROS to create a map of hiding spots for an Easter Egg hunt for JK/SK students  | **Success Criteria:** “We will be successful when we can…” -use the map that we have created in the JK/SK classroom, -plot the location of the SPHEROS using the mathematical calculations of the classroom,-place the SPHERO in the designated position using code from the foyer. |
| **Lesson Overview:** Students will be asked to create a floor plan of the JK/SK classroom using appropriate units of measure and types of measure (i.e. perimeter, area) to create a floor plan of the classroom. Students will use their knowledge of coding to place the SPHEROS in hiding places around the classroom. Once students find the SPHEROS, they will have the chance to drive the SPHEROS with the grade 7/8 students. Candy of some sort will be a reward for finding the SPHERO. |
| **Materials and Technology:**  Students will be using electronic devices (cell phones or school iPads) to code the SPHEROS. Pencils, markers and graph paper will be used to create the map of the classroom. |
| **Student Accommodations/Modifications:** **No accommodations needed- students will be working in groups to create the map and the calculations (students who require accommodations do not usually need accommodations when coding). Formulas will be provided if required, for creating the required floor plan.** | **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.** The students have had experience learning to drive the SPHEROS using the APP on their phone or on the schools iPads and have started to code the SPHEROS. The school has 16 SPHEROS, so the class of 24 will be put into pairs and will code the SPHEROS to hide for the JK/SK Easter Hunt. The students will be introduced by watching an older Looney Tunes video of Speedy Gonzales delivering Easter Bunnies to children to get them motivated.<https://www.youtube.com/watch?v=espHlugSiX8>**After the video I will explain that we are going to use the SPHEROS as Easter Eggs and we are going to hide them in the JK/SK room. The students will be the Easter Bunny, delivering the eggs to JK/SK students. The students will be given the rubric and assignment (attached).** **What key questions will you ask?** How are you going to draw or reproduce a detailed scaled drawing of the JK/SK classroom? Photo diary?How are you going to Code the SPHEROS and hide them in the classroom? What do you need to be able to get the SPHERO from the foyer into the classroom and into a hiding spot?What are the code commands that you will be using to get the SPHERO to the classroom and in a planned hiding spot? Do you need a plan?How are you going to measure the room? What types of measurement are you going to use to measure the room? Are there formulas that you might use? Does the hallway need to be measured as well?**How will you gather diagnostic or formative data about the students’ current levels of understanding?**Each group will need a plan to address any potential variables or obstacles.Each group will have to provide a scale drawing of the classroom and the obstacles and or furniture etc. in the room.All mathematical calculations will also need to be provided.Code commands will also need to be provided.The SPHERO must end up in the planned hiding spot.**How will students be grouped? How will materials be distributed?** **S**tudents will select a partner to work with and everyone will be provided with a SPHERO to work with. Each group will have to have a phone or iPad with the SPHERO App.  |
| **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.** The students will have a week prior to Easter. The 100 minute math periods and the Science or Geography periods for the week will be used (12 - 50 minute periods). The students will use a phone or iPAd to take a photo journal of the classroom when JK/SK students are outside. The students will also measure the classroom while the JK/SK students are outside. Students will then be required to create a scale drawing of the classroom and its contents. Students will then have the remainder of the periods to code and practice-run the SPHEROS. **What misconceptions or difficulties do you think they might experience?** The scale drawing will be difficult to create and make 100% accurate. **How will they demonstrate their understanding of the concept?**The SPHERO will end up in the indicated hiding spot.**How will you gather your assessment data (e.g., checklist, anecdotal records)?**The floorplan will be collected, the math will be collected, and the code script will also be handed in.Rubric is attached.**What extension activities will you provide?** If completed and successful, the students will help the JK/SK students drive the SPHEROS.  |
| **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)?** All students will be presenting at the same time and will be reflecting after the task is complete. We will have a group discussion about the ways to improve the task and how it can be improved for next year.**What key questions will you ask during the debriefing?** What was the most difficult part of the task? From previous coding lessons, were you prepared for this task? What else do you need to be more efficient at coding?  |

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| **Expectations**  | **Level 4 (A+, A, A-)**  | **Level 3 (B+,B, B-)**  | **Level 2 (C+, C, C-)**  | **Level 1 (D+, D, D-)**   |
| **Coding** | All commands are simple, direct and easy to follow  | Most commands are simple, direct and easy to follow | Commands are difficult to follow and do not work consistently  | Commands do not work  |
| **Drawing of Classroom** | -Includes all detail of the classroom -the scale is correct-all objects have been measured and include the mathematical formula | -Includes all detail of the classroom -the scale is correct -most objects have been measured and include most mathematical formulas | -Includes some detail of the classroom-the scale is not correct -most objects have not been measured/have been measured incorrectly -mathematical formulas are not present/are incorrect | -Includes little detail of the classroom-the scale is not correct-the measurements of objects have not been included -most mathematical formulas are incorrect |
| **Location of the SPHERO** | The SPHERO ended up in the intended spot on the first attempt | The SPHERO ended up in the intended spot after multiple attempts | The SPHERO ended up in the intended spot after being re-calculated | Students were unsuccessful coding the SPHERO to its intended target after multiple attempts |