

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

**School Board: CEPEO**

**Grade(s): 5/6**

**Subject(s): Mathematics (Measurement)
Olympiad of Robotics
Sphero Weightlifting**

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| **BIG IDEAS:**The Sphero has to transport as much mass as possible over a distance of 1 metre, as fast as possible, using a hand-built cart. **Curriculum Expectations:****OVERALL:**Use conventional mass measurement units and capacity units of measure in a variety of contexts.**SPECIFIC:** Estimate, measure and record the mass of objects by choosing the most appropriate unit of measurement (milligram, gram, kilogram, tonne).Build different objects. |
| **Learning Goals:**“We are learning to…”* Measure the greatest mass that a Sphero is able to pull
* Build a trolley
 | **Success Criteria:** “We will be successful when…”* Our Sphero pulls a trolley with the greatest possible mass inside
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| **Lesson Overview:**In our Olympiad team, students must design a trolley (cart) so that the Sphero robot can carry the largest mass possible over a distance of 1 metre, as fast as possible. To make an efficient cart design, the team has access to the Internet to do brief research in order to build the best possible trolley by drawing inspiration from those found online. The construction of the trolley is done with material found in the classroom, such as cardboard, pencils, rope, glue. This test is done under a period of one hour. |
| **Materials and Technology:** * Chromebooks
* iPads
* Spheros
* Rulers for measuring 1 metre
* Stopwatch
* Weights
* Various materials found in the classroom
* Hot glue guns
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| **Student Accommodations/Modifications:** Teams are strategically formed, according to their strength and weakness as well as group dynamics. In this way, each team member will be supported. | **Lesson will be differentiated by:*** **Process, specifically:**Collaboration
* **Product, specifically:**Points awarded based on speed
* **Environment, specifically:**

Participation points to be awarded during the Olympiad |
| **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 activity is introduced with the help of a video montage, during the opening ceremony of the Robotics Olympiad ™.Link for video: https://youtu.be/qAM8v4ep1Mw**What key questions will you ask? How will you gather diagnostic or formative data about the students’ current levels of understanding?**During work time, ask students questions to guide them while they create animations.The collection of data is done with the help of the video summarizing the Day of Olympiads.Example of video summary:Day 1: https://youtu.be/41Q9zR\_ -2f8Day 2: https://youtu.be/o9y\_ahhvkSs Day 3: https://youtu.be/cLXiQZz9YoUDay 4 and 5: https://youtu.be/ji7SzD7uioo**How will students be grouped? How will materials be distributed?** Teams are strategically formed according to their strength and weakness and dynamics.Team unveiling video: https://youtu.be/K99ez41ayB8 |
| **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?** The teams are called to do one test per day, over a period of one hour. They are expected to manage their time by taking into consideration the ideas of all members.**How will they demonstrate their understanding of the concept?**The teams are expected to pass each event in front of the judges' panel during the Olympics final. The judging panel consists of 3 judges: 1 member of the parent board, 1 school teacher and 1 EA.**How will you gather your assessment data (e.g., checklist, anecdotal records)?**Evaluation data is collected by video recordings, a checklist, participation, and the judging panel at the finals.**What extension activities will you provide?** Following the performance at the finals, a self-assessment will be done by each group. |
| **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)?** Teams must present to the judging panel.**What key questions will you ask during the debriefing?** After each day of events, debriefing is done with each team in order to be able to determine the winning strategies that were used and to determine the points to be improved, in order to assure a change in the next days, with the aim to accumulate the most points per event. |