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

**School Board: CEPEO**

**Grade(s): 5**

**Subject(s): Mathematics, Visual Arts  
Making a mini-golf course**

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| **BIG IDEAS:**  Students will create a 7-hole mini-golf course, which the entire school community will be able to use.  **Curriculum Expectations:**  **OVERALL:**  Solve problems related to the four operations using various strategies or personal algorithms.  Solve problems with different units of measure of length and perimeter in simple contexts.  Determine the area of figures and volume of solids using conventional measurement units**.**  **SPECIFIC:**  Describe and use various strategies to add and subtract numbers less than 100,001  Estimate and calculate, using technology tools, money to be paid, and change to be given, up to $1,000 as a result of any purchase (e.g., counting from the price of an item up to $725).  Measure, record and compare the perimeter of various 2D figures.  Estimate, measure, record, and compare the area of various irregular shapes using conventional square measure units (eg, algebraic tile, one-square-meter pattern, graphing paper). | |
| **Learning Goals:**  “We are learning to…”  Perform various operations to establish a budget of the different materials needed (and thus avoid certain other materials). | **Success Criteria:**  “We will be successful when…”  The mini golf course has been designed, and works as it should. |
| **Lesson Overview:**  Students must design a mini golf course, using area and perimeter concepts, and integrate them into an oral presentation (marketing/entrepreneurial style):  1 - As a team (2 or 3 students), students must first choose a theme and design a mini golf course respecting this theme.  2- Students should prepare a presentation to present their project in front of "*dragons*" (small group of staff, as in the theme of *Dragon’s Den*) in the hope of getting an investment. Each team is given an imaginary budget ($125 for first place, $100 for second place and $75 for all other teams).  3 - It is now necessary to calculate the area of the gymnasium (where the mini golf courses will be installed) and the space that has been allocated to them. Using a grid sheet and establishing the scale, students must plot their land and calculate the area of their land to buy the right amount of artificial turf (We obtained a donation of AstroTurf).  4 - With their budget, students can come and get the products needed to design their mini golf course. They must take into account the taxes.  5 - The students make the course according to their theme and the material purchased. They must also build a three-dimensional obstacle or mound with wood to show a 3D shape.  6 - Students must install everything in the gym and plan the logistics of the event. | |
| **Materials and Technology:**   * Technology (MakeyMakey, Chromebooks, digital projector) * Material (recycled materials such as cardboard boxes, aluminum cans, egg cartons, etc., Lego, toys, flowers, balloons based on the theme) | |
| **Student Accommodations/Modifications:** | **Lesson will be differentiated by:**   * **Process, specifically:**   Collaboration, oral presentation |
| **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.**  Presented at the beginning of the year because it was necessary to raise funds to buy artificial turf and other necessary materials.  "You have been selected as an engineering firm to design a mini golf course for our school."  **What key questions will you ask? How will you gather diagnostic or formative data about the students’ current levels of understanding?**  Review concepts taught in mathematics: area / perimeter  Go to the gym and ask students to suggest how we could have our mini golf courses and think about the logistics.  Calculate the area of the gymnasium; divide it according to the teams. Use a grid sheet to propose layout plans.  **How will students be grouped? How will materials be distributed?**  Students form their own team.  1 - Grid sheets (distributed)  2 - Proposed theme for approval by the teacher (distributed)  3 - Creation of a Google Slide or other for the presentation in front of the *dragons* (created by the students, shared with the teacher)  4 - Various materials for construction | |
| **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?**  1- Calculate the area of the gymnasium and divide according to the teams (**Difficulty**: Draw the plan to scale, propose the divisions of the space)  2 - Choose a theme (**Difficulty**: Make compromises to choose a theme for the team)  3 - Presentation in front of the *dragons* (**Difficulty**: Stress of the presentation, adopting a marketing tone to successfully obtain the financing)  4 - Design of the mini golf course (**Difficulty**: the vision is not the same as the construction)  **How will they demonstrate their understanding of the concept?**  Via the plans they will design. They will have to create a description of their mini golf course.  **How will you gather your assessment data (e.g., checklist, anecdotal records)?**  Anecdotal notes  Photos, videos.  Interviews with students  Descriptive sheets of their project.  Via the plans they will design. They will have to create a description of their mini golf course.  **What extension activities will you provide?**  Students could animate their mini golf course using Scratch | |
| **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)?**  A whole day during which all the students of the school will have the chance to come to play on the courses built by the students of the class.  **What key questions will you ask during the debriefing?**  A reflective card at the end of each shift. Challenges? Achievements? Next steps? Questions?  Whole group debrief: What worked well? What could we improve next time? | |