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| **Lesson Title:**  Putt Putt Golf |  |
| **Grade Level:** 3rd | **Quarter:**  4th  |
| **Standards:**Math:MGSE3.MD.4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.MGSE3.MD.7 Relate area to the operations of multiplication and addition. a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. b. Multiply side lengths to find areas of rectangles with whole number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.MGSE3.MD.8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimetersScientific Method/Engineering Design Process |
| **Lesson Essential Question:** * How can I determine the area and perimeter of my golf green?
* How can I program my sphero to reach the putt putt golf holes.
 | **Vocabulary:** ProgrammingAreaPerimeter  |
| **Lesson Materials:**Student journalAstroturf (optional)PVC PipeBoxesWood PiecesFoam Bumpers for BorderStudents may request other materials to use  | **Lesson Assessment:** Student JournalTeacher ObservationsArea and Perimeter Calculations  |
| **STEM Challenge Overview:**Design a putt putt golf hole and then program Sphero to reach the hole at the end of each putting green |
| **Teacher Background:** Discuss with the kids what putt putt golf is, and ask them what they know about it or have been before. Show pictures of what a putt putt golf course looks like and how the game works. Engage with this clip: <https://www.youtube.com/watch?v=7OcaNgi4OC4>  |
| **INSTRUCTION** |
| 1. **Ask/Engage**
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|  Discuss with the kids what putt putt golf is, and ask them what they know about it or have been before. Show pictures of what a putt putt golf course looks like and how the game works. Engage with this clip: <https://www.youtube.com/watch?v=7OcaNgi4OC4> Have the students notice what they saw at the golf course (obstacles, hills, etc) and brainstorm those ideas on the board. Introduce the challenge to the students and have them complete the ask/engage part of their student journal. **Challenge :**You are your design team have been called upon by the Town of Smyrna to create a new attraction for the town and visitors. Your job is to design and construct a putt putt golf course for families to use in Town Market Center. Each green will need to be rectangular in shape, have obstacles, and have a small space designated as the “hole.” Once your green has been created, we will use the spheros to program the robots to the specific hole of each green.  |
| 1. **Imagine/Brainstorm**
 |
| Introduce the criteria/constraints to the students.**Criteria:*** Each green must be rectangular
* Must measure the area and perimeter of your green
* Tries and Fails of each sphero code must be recorded, as well as how you will improve your code at each step

**Constraints:*** Use the materials provided
* Complete the challenge within the time allotted

Have students individually think of a solution to the problem and draw and label their design. |
| 1. **Plan/Design**
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| Each student will present their ideas to their team. Teams will collaborate and decide on a final design plan. Students draw and label their final design plan and make a list of needed supplies. Build their design according to their plan. |
| 1. **Create / Test**
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| Student teams build their design according to their design plan.   |
| 1. **Evaluate/Improve –** and repeat Steps 1-5
 |
| Students evaluate their design for success. Did it meet the established criteria? Did their final design match their planned design? How would students improve their design? |

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Putt Putt Golf STEM Challenge

 3rd Grade

 

**Challenge**:

You are your design team have been called upon by the Town of Smyrna to create a new attraction for the town and visitors. Your job is to design and construct a putt putt golf course for families to use in Town Market Center. Each green will need to be rectangular in shape, have obstacles, and have a small space designated as the “hole.” Once your green has been created, we will use the spheros to program the robots to the specific hole of each green.

**Criteria:**

* Each green must be rectangular
* Must measure the area and perimeter of your green
* Tries and Fails of each sphero code must be recorded, as well as how you will improve your code at each step

**Constraints:**

* Use the materials provided
* Complete the challenge within the time allotted

**Materials:** Various materials will be provided by your teacher.

1. **ASK / ENGAGE:** What is the problem you are being asked to solve?

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1. **IMAGINE/BRAINSTORM:** What are some possible solutions to the problem that you are trying to solve? After you brainstorm, draw and label your ideas below.

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| **Idea #1** | **Idea #2** |

1. **PLAN/DESIGN:** Share your ideas with your group and collaborate to decide on a final design plan. Draw your team’s design below and make a list of the materials that you will need to complete your design.

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| **Team Design Plan**  | **Materials List** |

1. **CREATE/TEST**: Use your Final Design Plan to create and build your solution. Test your design. Did it work? Why or Why not?

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1. **EVAULATE/IMPROVE:**  How well did your design work? Did your solution solve the problem within the given constraints?

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How can you improve your design? How can you make it better? Draw and label your improved design below.

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| **Improved Design Plan** |

**Sphero Programming**

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| **Hole 1: \_\_\_\_\_\_\_\_ Tries \_\_\_\_\_\_\_\_ Fails****Notes:** | **Hole 2: \_\_\_\_\_\_\_\_ Tries \_\_\_\_\_\_\_\_ Fails****Notes:** |
| **Hole 3: \_\_\_\_\_\_\_\_ Tries \_\_\_\_\_\_\_\_ Fails****Notes:** | **Hole 4: \_\_\_\_\_\_\_\_ Tries \_\_\_\_\_\_\_\_ Fails****Notes:** |
| **Hole 5: \_\_\_\_\_\_\_\_ Tries \_\_\_\_\_\_\_\_ Fails****Notes:** | **Hole 6: \_\_\_\_\_\_\_\_ Tries \_\_\_\_\_\_\_\_ Fails****Notes:** |
| **Hole 7: \_\_\_\_\_\_\_\_ Tries \_\_\_\_\_\_\_\_ Fails****Notes:** | **Hole 8: \_\_\_\_\_\_\_\_ Tries \_\_\_\_\_\_\_\_ Fails****Notes:** |