**Grade:** Intermediate (7-8)

**WEEK 1 – My Friend Robot Geometry**

**Unit:** Spatial Sense

**Curriculum Expectations**  
solve problems involving the perimeter, circumference, area, volume, and surface area of composite two-dimensional shapes and three-dimensional objects, using appropriate formulas

**SEL:** work through challenging math problems, understanding that their resourcefulness in using various strategies to respond to stress is helping them build personal resilience

**Activity  
1)** Students will write step-by-step ‘code’ programming a ‘robot’ (sibling, parent, themselves) to create a series of polygons using individual coding instructions that will be performed by the robot **2)** Students will need a large empty space to program polygons and something that the robot can leave at the corners of the polygon for measurement later   
**3)** Students will only be allowed to write 2 phrases as code: “take one step” (robot takes one step forward of approximately half a metre) *and* “turn \_\_\_ degrees right/left” (robot will turn according to code)   
**4)** Students will write code to have the robot create the specified polygons. (There may be multiple right answers)   
**5)** Once code is written by the student, robot will perform the code exactly as it is written, dropping a marker when they are instructed to turn  
6) Once code is complete, students will fill out the recording sheet (below)  
**Note:** Code must be followed exactly. If for whatever reason code does not go as originally thought, students are not to simply add an extra piece of ‘code’ mid-operation to make the code work. Code must be restarted if not successfully completed after a change is made.

**Check for Understanding**   
I understand how to construct, rotate and transform different polygons based on the criteria provided. I understand congruent and similar shapes  
I understand the importance of each piece of ‘code’

**Materials**   
Recording sheet (attached below), pencil, clear space, protractor (can be printed from online), small item to mark corner of triangles

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Shape to be programmed or prompt | Drawing of the final product | Measurements of the sides and angles | Area and perimeter | Description of any changes to the code |
| Program a scalene triangle with any dimensions you choose. Reflect this triangle along one edge, how do you need to change the code? |  | 3 m  4 m  5 m  900  400  500 | 12 m  7.5m2 | When I changed my code, I had to have my robot walk do the opposite action. If my robot was walking left, it had to walk right the same number of steps. If I had it turn 400 left, it had to turn 400 right. |
| Program as many triangles as you can with one line of 3 meters and an angle of 800. How do they change each time? |  | 3 m  3 m  800 |  |  |
| Imagine the robot is a pencil and you cannot pick up the pencil. Program the robot to draw two perpendicular bisecting lines. |  | n/a | n/a |  |
| Program a shape with only one set of parallel lines |  |  |  |  |
| Triangle - Can you create two triangles with the same area but different dimensions? |  |  |  |  |
| If you put four congruent squares together, you will make a square similar to the first, program another shape you can do this with | ex. |  | n/a |  |

3m