Title
Area Functions

Description
In this lesson, you will be challenged to write code to make quadrilaterals that you have made by hand in Minecraft. 7-9 yrs old, Math, Area, Functions, Shapes

Learning Objectives
Play with the function for the area of a quadrilateral to understand how the width and height relate to how many blocks are within the entire area of the shape.

Guiding Ideas
Understanding the relationship between the width and height of a shape and the number of blocks that create the solid shape is difficult for third grade students. Specifically looking at the Common Core Math Standards:
CCSS.MATH.CONTENT.3.MD.C.6
CCSS.MATH.CONTENT.3.MD.C.7

Student Activities
This activity requires students to have Code Connection open and running with their Minecraft Education Edition.

This activity consists of 2 parts:
Creating Quadrilaterals
Coding Quadrilaterals

Creating Quadrilaterals
Lead a class discussion on quadrilaterals, specifically calling out that they always have 4 sides. It is recommended that students focus on squares and rectangles for this activity, but will be able to extend to parallelograms if advanced coders.

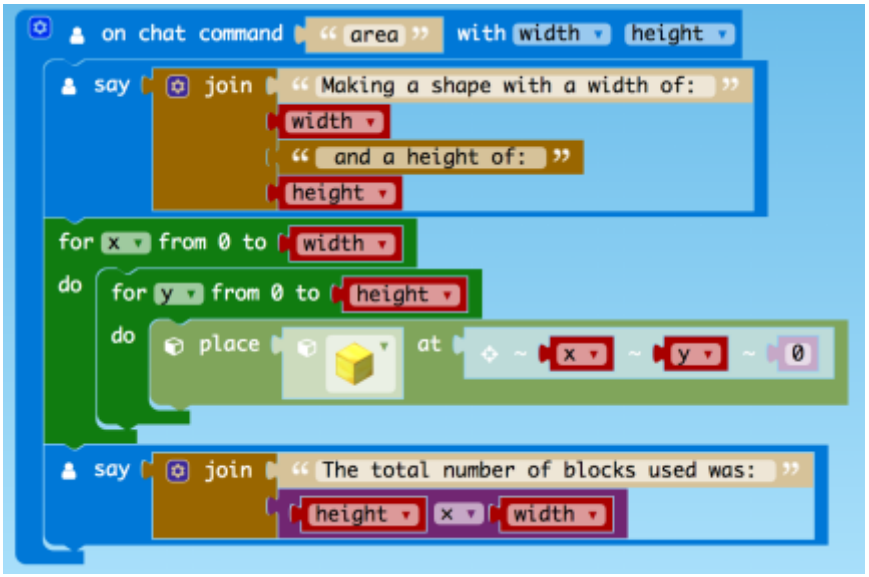
Have each student choose a Minecraft material (such as gold) and build a quadrilateral as a wall (height is actually moving upwards). To start, each student should be given a number between 15 and 30 and are only allowed to make a quadrilateral with that number of blocks.

Using the Area Worksheet, have each student work through their individual shape. You can lead this as a class discussion activity, or as an individual activity. Lead a discussion with the entire class, showing examples of different student's worksheets and how there is a relationship between adding the number of rows over and over and multiplying the rows by the columns.

Coding Quadrilaterals

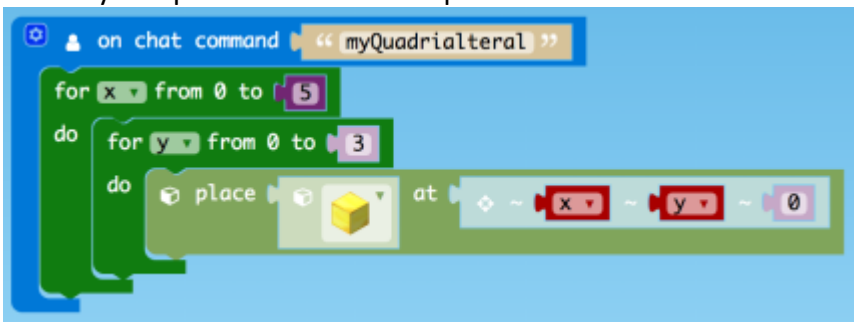
After students have completed the Area Worksheet, lead a discussion on the area formula and walk students through the mod that will create their shape AND report the area.

Here is the final code:

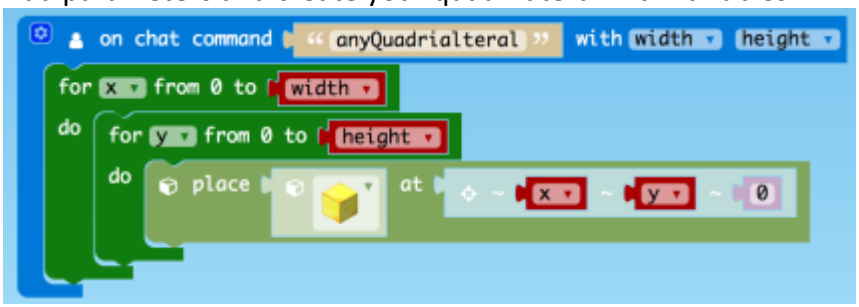


And the recommended steps:

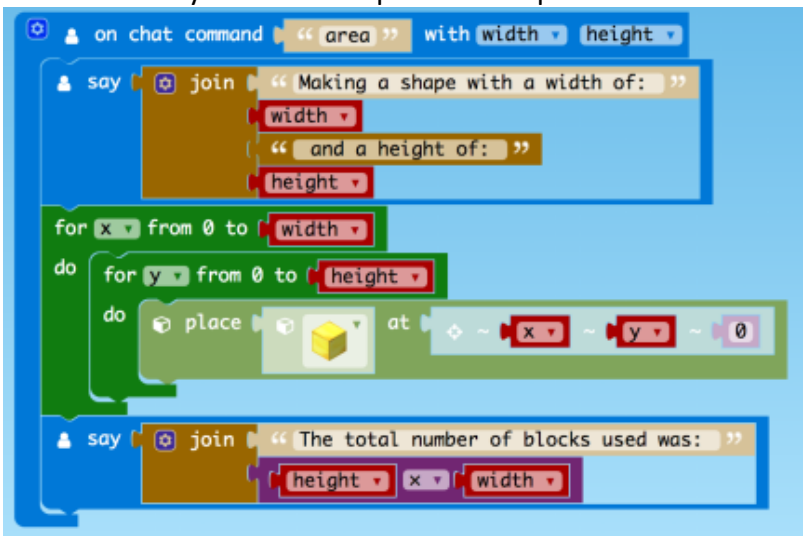
1. Create your quadrilateral with loops:



2. Add parameters and create your quadrilateral with variables:



3. Add in the “Say” blocks to explain the steps:



Performance Expectations

Expected outcomes include:

- Allowing a class period to build and share quadrilateral shapes within Minecraft to understand how the height and width change the area.
- Allowing a class period to discover the formula for area and then to compare and contrast quadrilaterals based on the formula and the shapes within Minecraft