Robotic Math

Sixth Grade + Math and Visual Arts

Adapted by L. Lang

CORE SUBJECT AREA
Math

ART FORM + ELEMENTS
Visual Arts
Drawing, Painting, Line, Shapes, Color, Space, Proportion

MSCCR STANDARDS
6.G.A.1 - Find the area of right triangles other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes.

6.SP.A.1 - Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.

MSCCR CREATIVE ARTS STANDARDS
VA:Cr2.2.5a -Demonstrate quality craftsmanship through care for and use of materials, tools, and equipment.

DURATION
1 class period

OBJECTIVES
- I can create shapes on the coordinate plane.
- I can find the area of triangles and polygons.
- I can decide whether or not a question is statistical.
- I can use different artistic materials.
- I can discuss reasons for choosing materials with a partner.

MATERIALS NEEDED
Graph paper, Pencils, Rulers, Markers, Crayons, Paint, Paintbrush, Cups for water, Tools, and Equipment

VOCABULARY
Area, Right Triangle, Special triangle, Polygon, Rectangle, Multiply, Coordinate, Plane, Vertices, Coordinates, Straistical, Variability, Data

RECOMMENDED RESOURCES
A previously made robot might help the students to see what to make/ where to start.

LESSON SEQUENCE

Begin the lesson by showing the students a previously made coordinate plane robot. Explain that it is made up of smaller shapes like squares and rectangles, when put together form the total shape of the robot. Remind students that area is found using the given formulas for triangles and rectangles (write these formulas on the board so students have them for reference).
As you explain about the robot, pass out graph paper, rulers, and different forms of media to color robots with (crayons, paints, paintbrushes, water cups, markers, oils, chalk, etc).

Tell all the students to begin their robot by drawing a square in the middle of the grid. This will be the body of the robot. It can be whatever size they choose, but remember a square has all sides of equal length; so if they choose to make the top 5 cubes long, all sides need to be 5 cubes long.

After they draw the initial square, the rest of the robot is up to them in terms of shapes and sizes. The robot must have 2 arms with a hand on each arm, 2 legs with a foot on each leg, a neck, a head, 2 eyes, and a mouth. They may also add other things like fingers, antennas, horns, teeth, spikes, etc. Tell the students to get as creative as

possible. After they have finished creating their robot, they will color him with the media of their choosing. They may use the same media for the entire robot or they can mix it up. While the students are creating their robots, the teacher will be asking questions to the class. She will explain that a statistical question is one that anticipates variability in the data related to the question; or in other words, a statistical question will get multiple different answers where as a non-statistical question will get just one answer. The first question the teacher will ask is "What is the first shape drawn for the robot?" Every student will answer "square" that makes this a non-statistical question. The next question she will ask is "What is the second shape drawn for the robot?" As she asks different students, the answers will change to "square, triangle, rectangle, etc" because all of the robots are different. This is an example of a statistical question because there is variability in the answers. The teacher will continue to ask questions and will explain that even if the answers change even once, it is considered a statistical change. Once the students are finished coloring their robots, they will number their shapes. They will need to find the total area of the robot, by finding the area of each shape that makes up the robot. They will use the area formulas on the board to do this. The teacher will remind the students that a total is a summation of all parts so to find the total area of the robot.

EXTENDED LEARNING ACTIVITIES
Students may add in circles and circumference if they want a more challenge add in.

SOURCES
adapted from: http://goodmorningmrsrubie.blogspot.com/2012/09/area-robots-classroombook-freebie.html