Student Name: Lisa Dalton
Scratch ID: msdalton
Course: CS505 Dr. Heckendorn, University of Idaho
Date: 10/26/2017
Assignment: 4T

Title of Assignment: Scratch Draws Polygons- Lesson Plan using Scratch

Your name and name of school: Lisa Dalton, American Heritage Charter School

Target age group and student composition: Target age group 6th, 7th, 8th grade Technology and Math classes cross-over activities (requested by my principal) A more advanced Mathematics / Technology crossover project is being developed and will be assigned to 9th grade Business Applications students.

Objectives of the assignment:

Bridge Technology and Mathematics Classes- Project

Introduction to Scratch Programming
Using Scratch Interface
Working with Backgrounds, Sprites
Commands and routines to draw
Create a program to Draw a Regular Polygon
Modify codes to draw different polygons (number of sides, corresponding angles)
Understand code process and troubleshoot errors
Recognize use of Scratch as a creative learning/teaching tool

Mathematics: Geometric Shapes
Gain understanding of geometric shapes (Regular Polygons) and the angles they contain through visual modeling using Scratch programming.
First introduction leading to a team project that students will create a math story, mathematic tutorial, math game or math simulation addressing mathematical concepts. Students will increase understand of concept as they develop code and run simulation.

Description of problem including tasks to perform and assessment.

o Create a Scratch program to draw a geometric shape: Polygon (50 points possible)
o Your program should have a grid background (10 points)
o Your program should have at least w2 sprites (10 points)
o One sprite provides text defining what a Regular Polygon is.
o The sprite must use the pen command to draw, set pen color to red, set pen size to 4 and when it is done drawing, use the pen up command so you can move the sprite to another location without additional line. (5 points)

- o Make the sprite disappear after your drawing is complete and you have moved it to another location. (10 points).
- o Prompt for number of sides and the degree of angles (15 points)

Questions to ask student for reflection on their task?

1. What happens if your number of sides and the corresponding angles are not correct?

2. Can other shapes be drawn using this technique. How might you create a routine to have Scratch draw an ellipse or an irregular polygon?

3. How can this program be used for solving other types of mathematical problems? Give some examples.
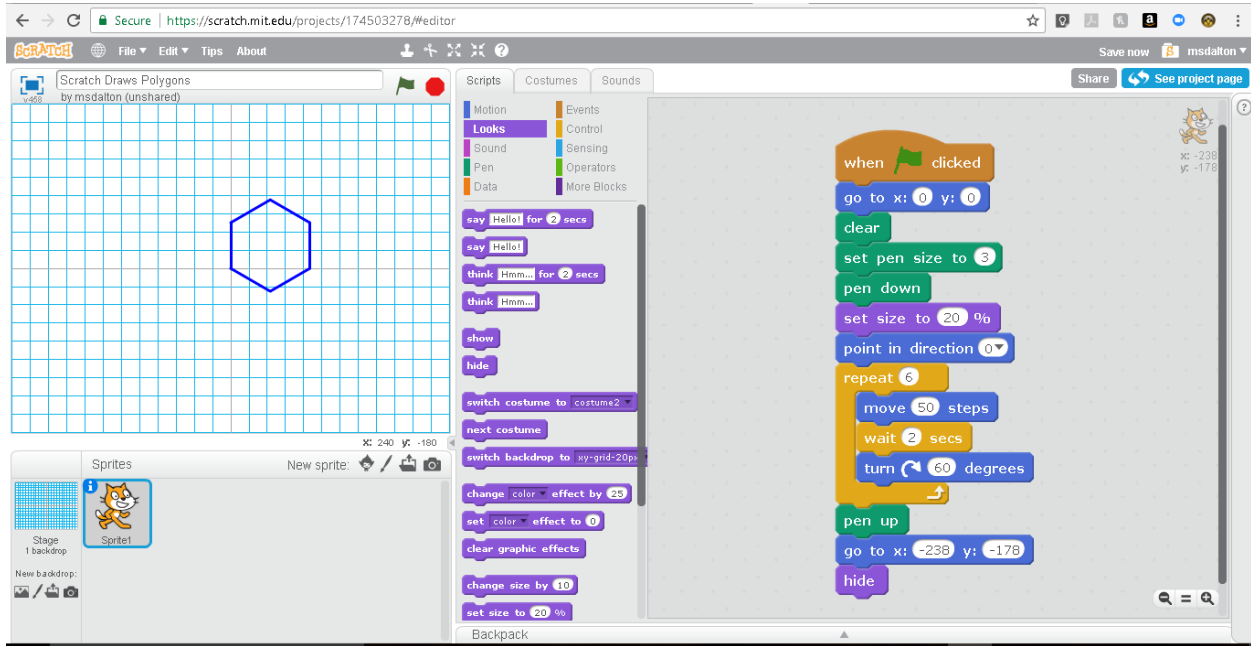
Support material:
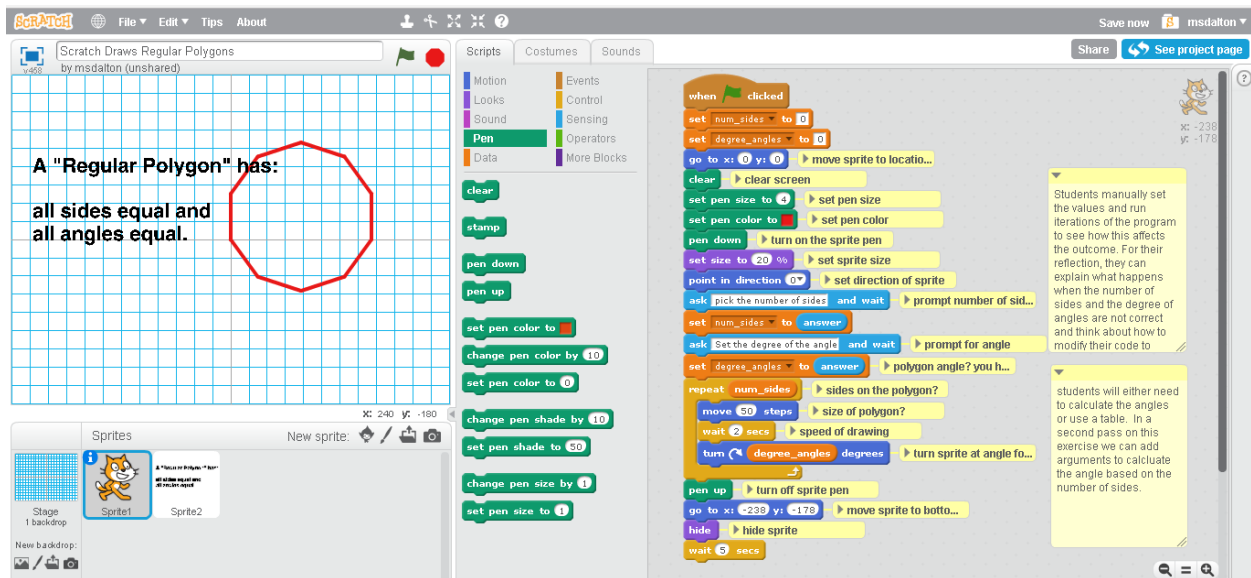
Sign-up invitation (email) to my Scratch Classroom
https://www.mathsisfun.com/geometry/regular-polygons.html
https://www.mathsisfun.com/geometry/interior-angles-polygons.html
http://study.com/academy/lesson/what-is-a-polygon-definition-shapes-angles.html

Example answers.

Example 1

Example 2

STANDARDS Addressed:

Idaho Content Standards for Mathematics

Geometry7 G Draw, construct, and describe geometrical figures and describe the relationships between them.

1. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

2. Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions.

Idaho Computer Science Standards

6-8.AP.05 Create, analyze, and modify control structures to create programming solutions. (Grades 6-8) Creating Computational Artifacts Creativity and innovation ◦ Communication and collaboration ◦ Research and information fluency ◦ Critical thinking, problem solving, and decision making ◦ Technology operations and concepts

6-8.AP.08 Evaluate the correctness of a program by collecting and analyzing data generated from multiple runs of the program. (Grades 6-8) Testing and Refining Computational Artifacts Communication and collaboration ◦ Critical thinking, problem solving, and decision making ◦ Technology operations and concepts

6-8.AP.09 Use debugging and testing to improve program quality. (Grades 6-8) Testing and Refining Computational Artifacts Critical thinking, problem solving, and decision making ◦ Technology operations and concepts

Idaho Content Grades 6 – 8 INFORMATION AND COMMUNICATION TECHNOLOGY

Standard 1: Creativity and Innovation Goal 1.1: Demonstrate creative thinking, construct knowledge, and use information and communication technologies to develop innovative products and processes. Objective(s): By the end of Grade 8, the student will be able to:

6-8. ICT.1.1.1 Apply existing knowledge to generate new ideas, products, or processes.

6-8. ICT.1.1.2 Create original works as a means of personal or group expression using student selected resources.

6-8.ICT.1.1.3 Build models and simulations to explore systems, issues and trends.