

Superheroes, Murder Mysteries, and Minigolf: Challenging High School Geometry Projects

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Why Projects?

Projects deepen the understanding of key concepts

Projects help make math relevant, interesting, and fun

Projects provide an opportunity for craftsmanship and excellence to be developed

Curriculum Map

Unit	1	2	3	4	5	6	7	8	9	10
Title	Algebra Review	Basics of Geometry	Reasoning and Proof	Parallel Lines	Triangle Congruence	Similarity	Right Triangles	Area and Perimeter	Volume and Surface Area	Transformations
Project	Code Breaking Project	Mini Golf Project	-----	City Project	Sierpinski Triangles	Monument Project	Who Killed Roger Rabbit?	School of the Future		Superhero Transformation Project

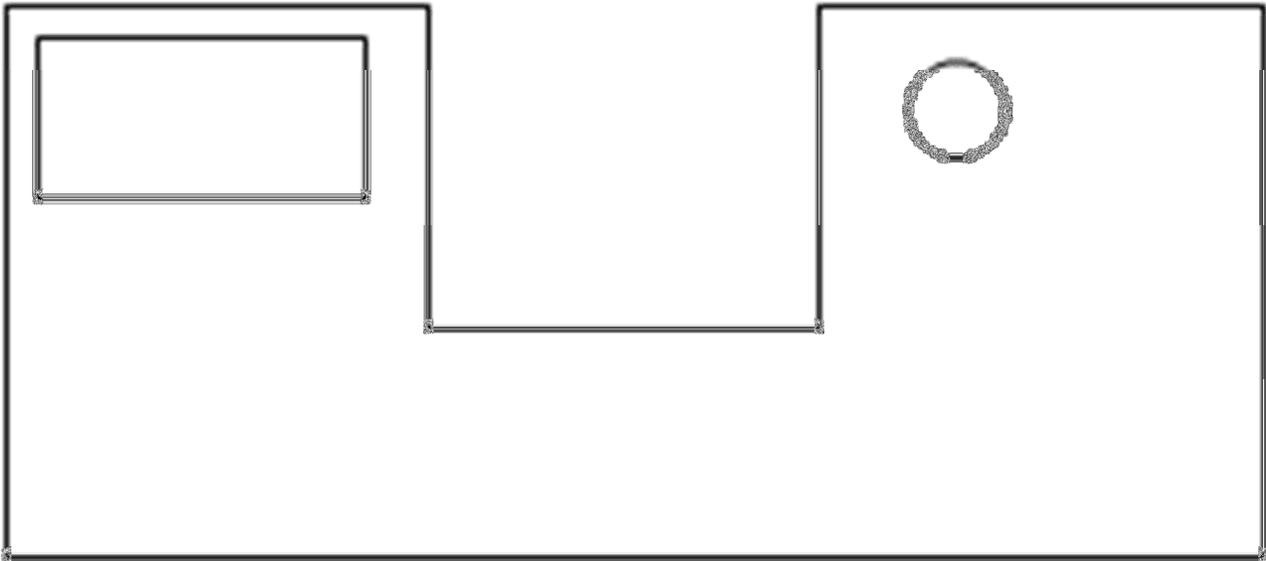
All of these resources at
www.highschoolmathprojects.weebly.com

The screenshot shows the homepage of the 'High School Math Projects' website. The header includes navigation links for HOME, PROJECT TIPS, OTHER LINKS AND RESOURCES, and ABOUT ME. Below the header, there are several project thumbnails, each with a title and a representative image:

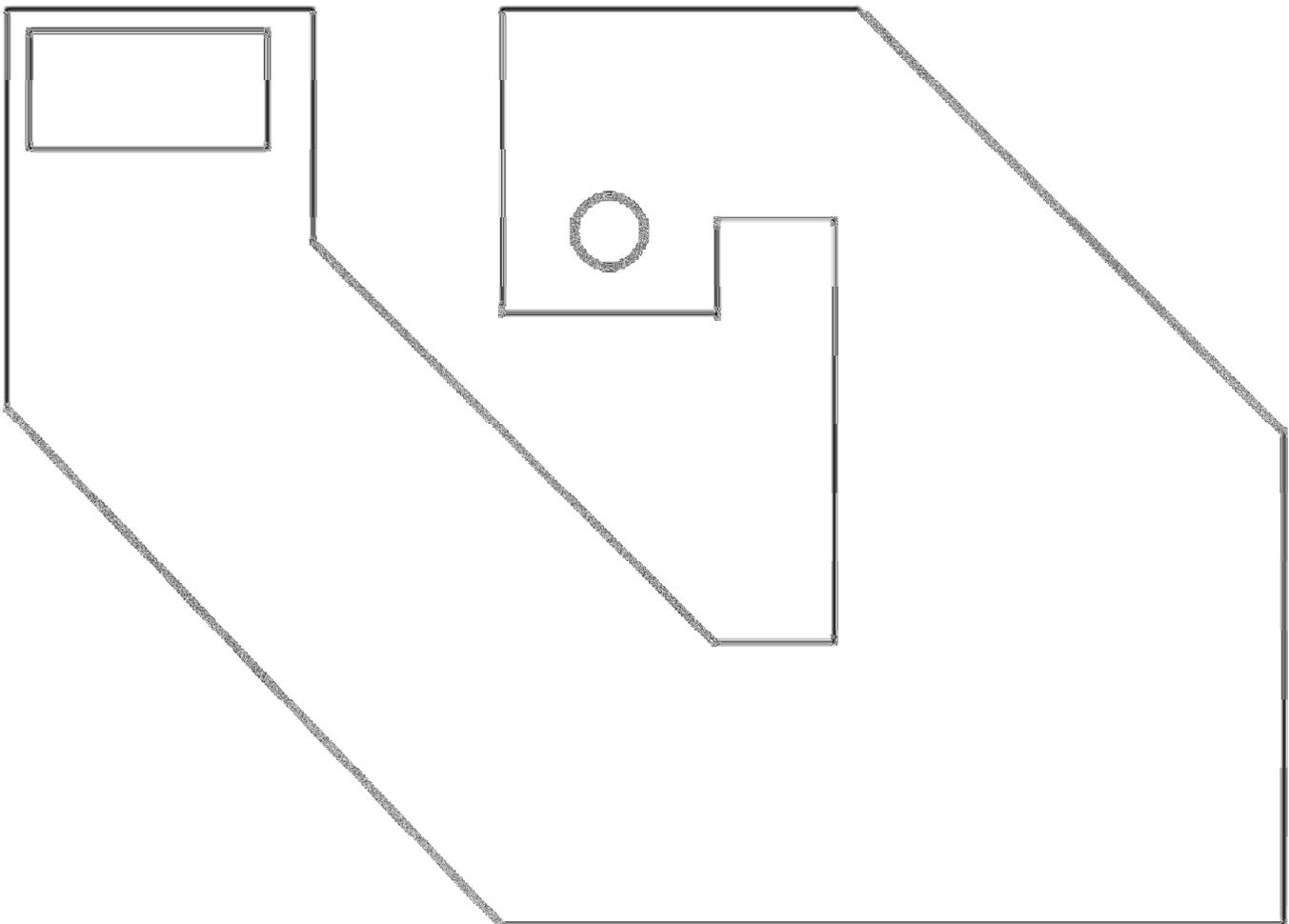
- Mini Golf Project**: Features a cartoon character and a golf course diagram.
- Sierpinski Triangle**: Shows a colorful fractal triangle.
- City Project**: Displays a 3D architectural model of a city.
- Who Killed Roger Rabbit?**: Includes a bar chart with data points and a cartoon rabbit.
- Monument Project**: Shows a blue-tinted image of a monument.
- Code Breaking Project**: Features a grid with numbers and letters.
- School of the Future**: Shows a futuristic architectural rendering.

Mini Golf Project

Hole #5 - Medium

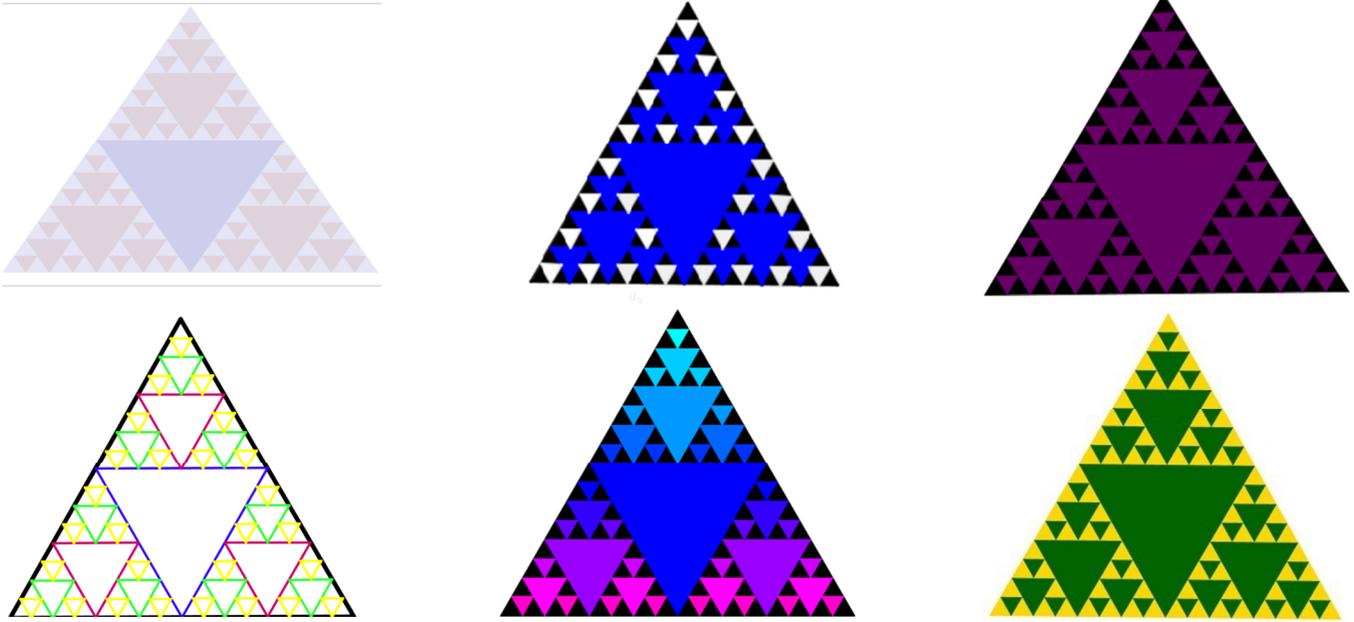


Hole #15 - Difficult



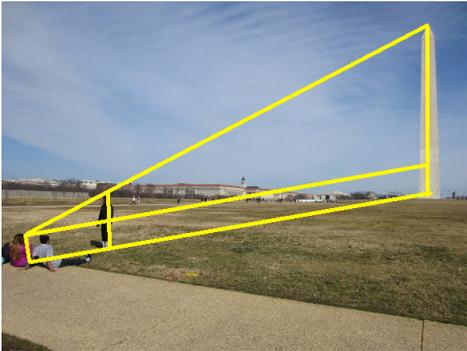
Sierpinski Triangles

Students use pencil and paper or Geogebra to create a Sierpinski triangle. Students are then asked to investigate the patterns that exist in the number of triangles of each side, as well as side length.



Monument Project

Students use similar triangles to measure the height of the Washington Monument using two different methods (shadows and perspectives). Students generate procedures and data sheets, as well as run a trial on a tree outside of school, before earning the chance to go on the field trip to the mall.



Procedure B Proportion :

Total Distance :
 $150 \times 78 = 1170 \text{ cm} \rightarrow 380 \text{ ft.}$
 Simone's height : $164 \text{ cm} \rightarrow 5.3 \text{ ft.}$
 Camera's height : $79 \text{ cm} \rightarrow 3 \text{ ft.}$
 $X = 3 \text{ ft.} / 5.3 \text{ ft.} = 388 \text{ ft.} / 8$
 $X = 3 / 2.3 = 388 / 8$
 $8(X - 3) = 892$
 $8X - 24 = 892$
 $+24 +24$

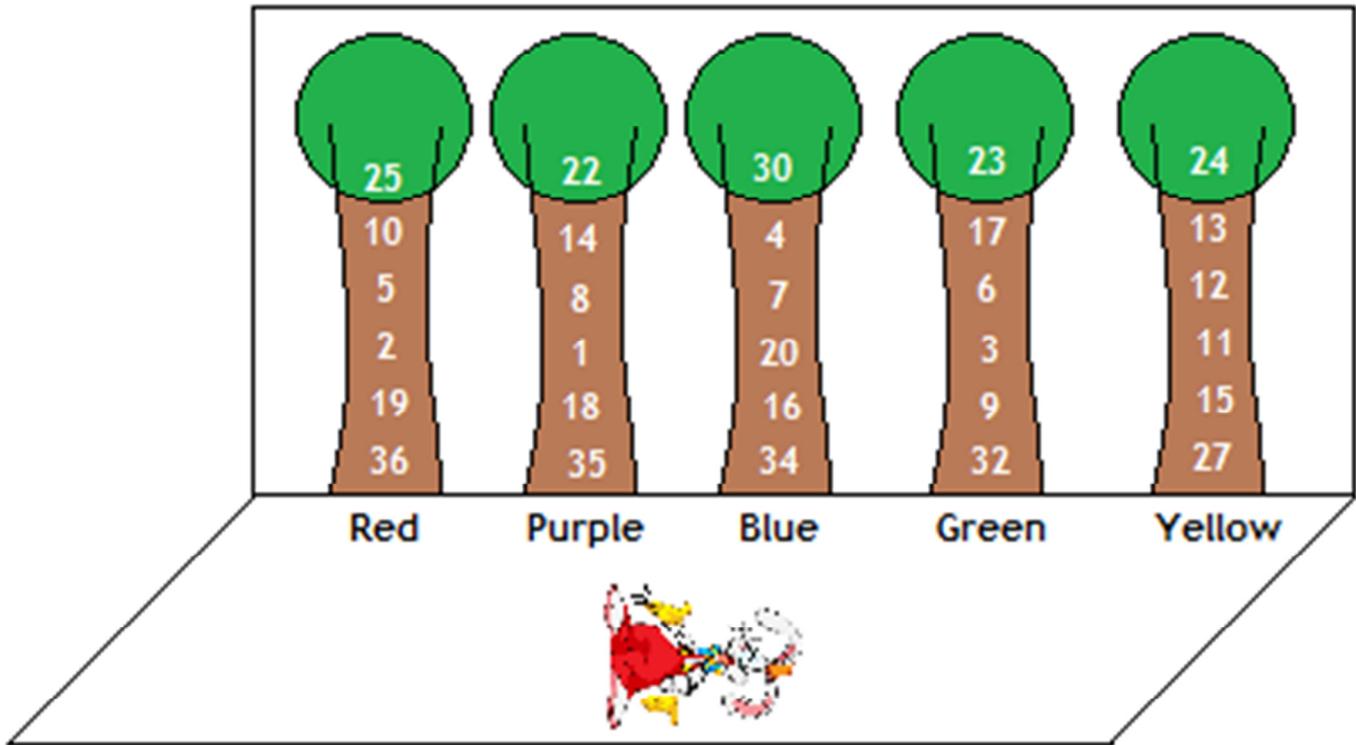
$8X = 916 \text{ ft.}$
 $916 / 8 = 114.5 \rightarrow 115 \text{ ft.}$
 $X = 115 \text{ ft.}$

Method 1: Shadow

1. Measure The Height Of A Person In Your Group - 149 cm
2. Measure Their Shadow- 224 cm
3. Measure The Shadow Of The Monument – 22050 cm
4. Set Up As Proportion To Find (X) Which Is The Height Of The Monument.

$$\frac{22050 \text{ cm}}{224 \text{ cm}} = \frac{X}{149 \text{ cm}}$$

Who Killed Roger Rabbit?



Superhero Transformation Project

Superheroes have many superpowers, but they are limited in how far they can move at once. Your superhero must abide by the follow limitations on their movement!

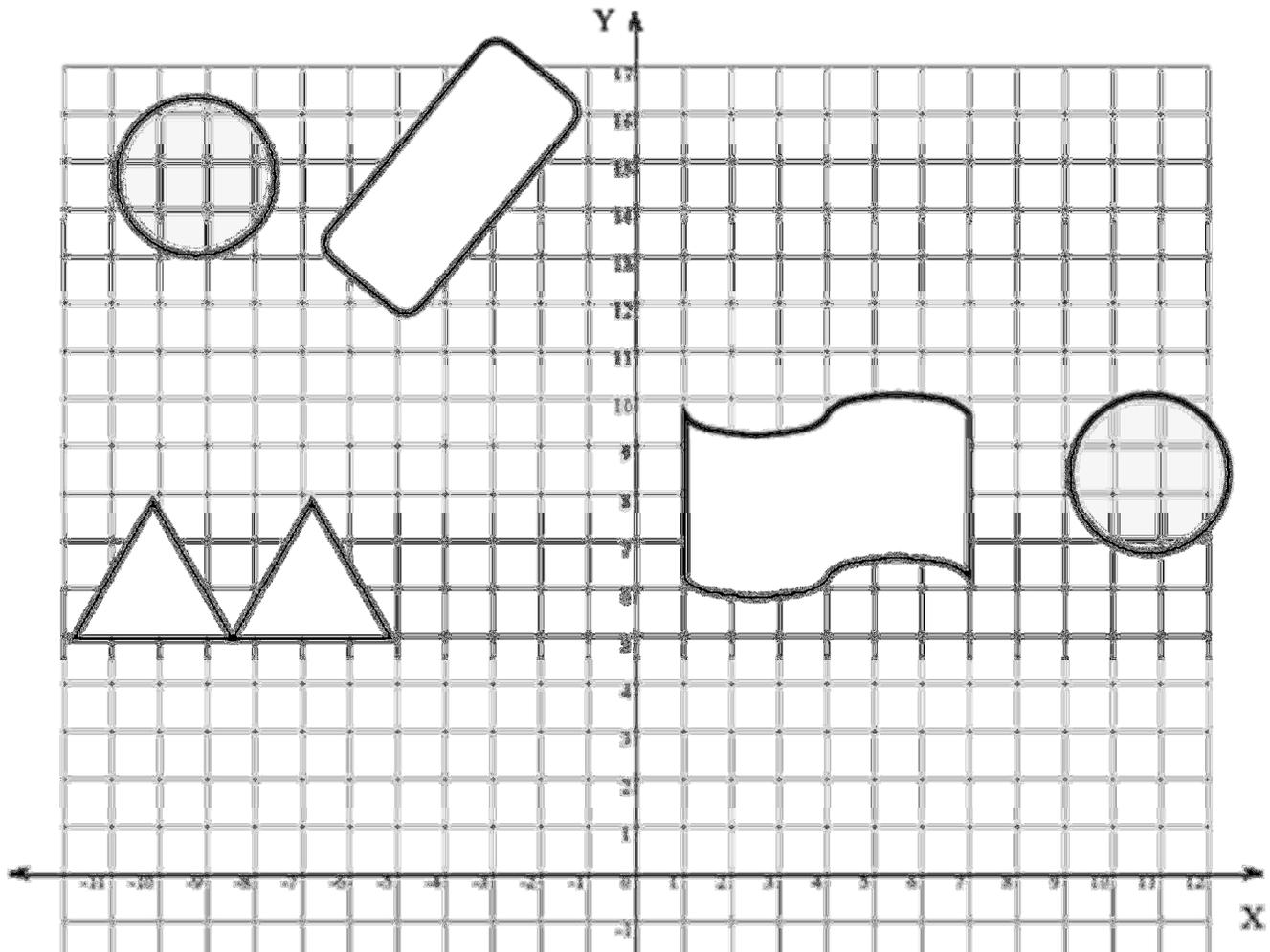
Superhero
Must have **one**
central Point

Cannot repeat same
transformation in a row

Reflections
Line of reflection must
be within 5 spaces

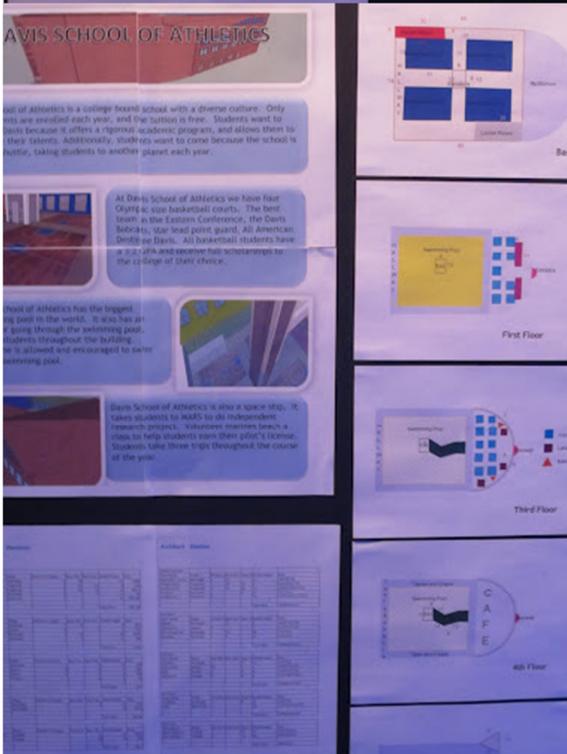
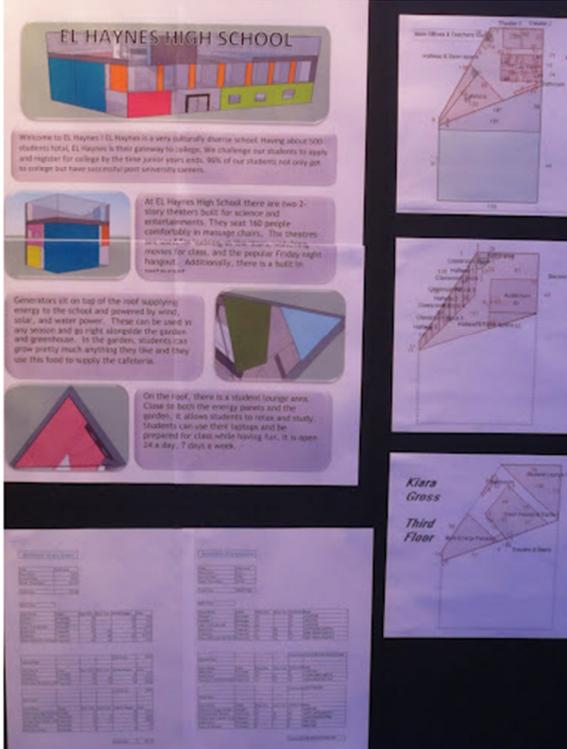
Rotations
Within 5 spaces

Translation
less than 5 units
vertically and
horizontally

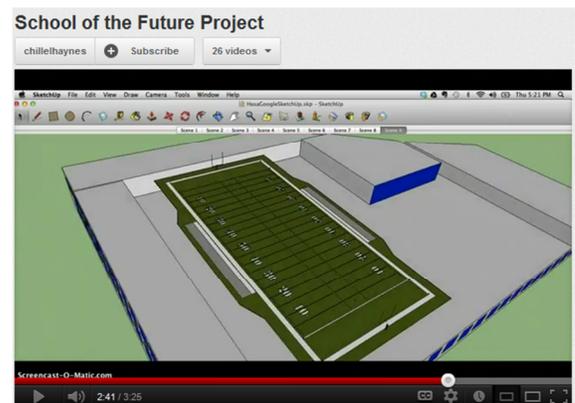


School of the Future Project

This project takes place during the units covering Area, Perimeter, Surface Area and Volume. In this multistage project, students develop their school of the future. They generate blueprints – on graph paper or a computer program, and then calculate the area and volume of their schools by programming a Google/Microsoft Excel spreadsheet. Finally, students use Google Sketchup to create a 3D model of their school and produce a video tour of the key features of their school.



<http://www.youtube.com/watch?v=5D8nnv7tpdU>



Notes