Superhero Transformations

How <u>algorithmic thinking</u> can help create visual stories

Introduction to Computational Thinking: Vocab

Abstraction: Ignoring unimportant details in something complicated
<u>In this project</u>: Simplifying the design of your superhero with basic shapes
You also used abstraction in Ms. Hauber's class when making 3D atomic models!

Decomposition: Breaking down a big problem into smaller pieces
<u>In this project</u>: Dividing your superhero story into four comic panels

Algorithmic thinking: Creating or using a list of steps needed to complete a task
<u>In this project</u>: Finding the series of geometric transformations between panels

Project overview

You are going to create a superhero comic strip! To do this, you will:

- Design your own superhero
- Simplify your superhero using basic shapes
- Write a short story about your superhero
- Place your superhero in the first of four comic panels, and then use geometric transformations to get your superhero into the other three panels
- Finalize your comic strip with other characters, props and scenery

Step 1: Create your superhero
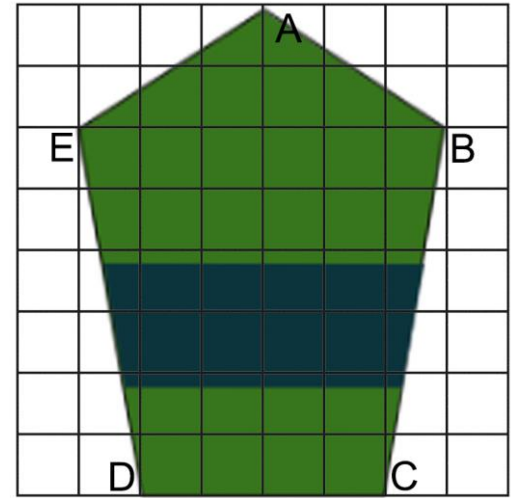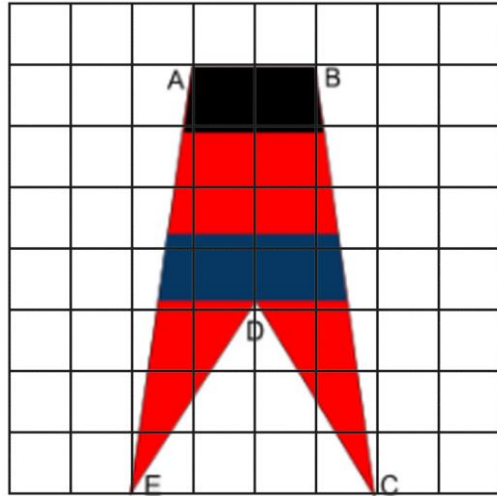
Come up with a <u>name</u> and one or two <u>superpowers</u>

<u>Sketch</u> your superhero in the square provided

# Step 2: Use <u>abstraction</u> to simplify your design

Recreate your superhero with a simple geometric shape with five or fewer labeled vertices. Your vertices must land on the intersection of two grid lines.

Step 3: Write your superhero story

Choose one of the following three story ideas, then write out your story in a short paragraph, at least 5 complete sentences.

- The first day your superhero discovers their powers. Things get a little out of control!

- A supervillain (of your own design) has kidnapped your best friend - how will your superhero free them?

- An alien army is invading Tacoma - how will your superhero stop them and save the world?
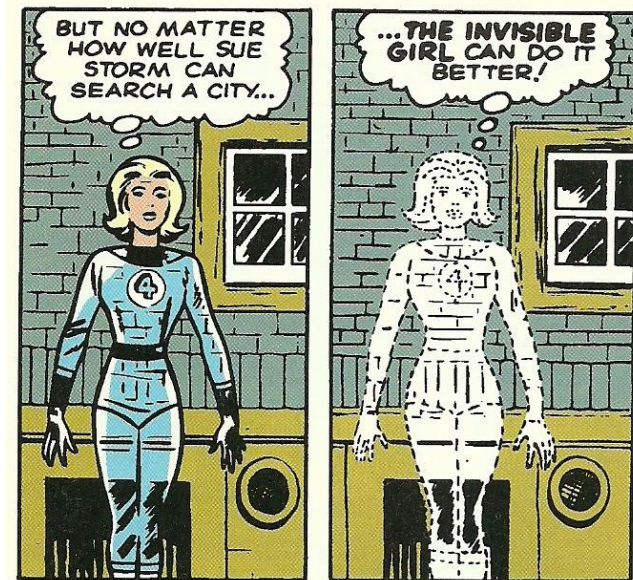
# **Step 4: Use <u>decomposition</u> to break down your story**

Your story needs to be broken down into four comic panels. Each panel needs to include your superhero. Each panel can also include:

- Other characters

- Props and scenery

- Speech or thought bubbles

- Captions or sound effects

Step 5: Cut out your hero and put him or her in Panel 1

Trace your simplified hero design into the first panel, making sure your verticles land on grid lines.

Record the coordinates of each vertex on your handout
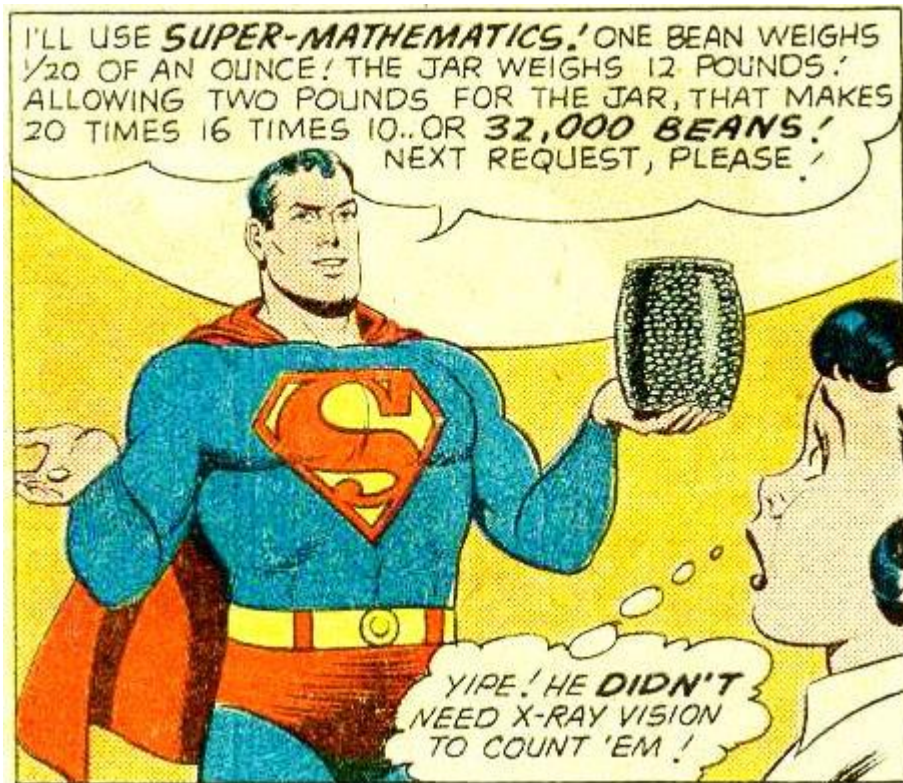
Step 6: Use <u>algorithmic thinking</u> to move your hero

For each panel, come up with one or more transformation (translation, reflection or rotation) to get your superhero where you want them in the panel.

● You must use at least one reflection OR one rotation in your project

● You must write your steps, including what transformation(s) you did and the coordinates of each vertex in each panel

● Use the cutout to help visualize where you want your hero in each panel

Example: To get my hero from Panel 1 to Panel 2, I...	translated by 3 units in the y-direction (up)
	A_2: __5__ , __15__ B_2: __0__ , __18__ C_2: __-5__ , __13__
	D_2: __-9__ , __4__ E_2: _____ ,

Step 7: Complete your comic!

Looking back at your story from Step 3 and your panel sketches from Step 4, fill in the remaining details in each panel. These could include:

- Other characters (good guys, bad guys or innocent civilians)

- Scenery (buildings, trees, cars…)

- Word or thought bubbles

- Captions describing what's happening in each panel

Project Component	Point Value
Planning steps completed: ● [Step 1] Superhero name and superpowers listed ● [Step 2] Simplified geometric superhero drawn and cut out ● [Step 3] Story written in short paragraph form ● [Step 4] Each panel sketched with the superhero included in each ● [Step 5] Starting coordinates correctly identified	_____/25 (5 points per step)
Final comic panels completed	_____/12 (3 points per panel)
The steps between each panel listed in the table include: ● correct geometric transformations ● coordinates for the superhero's vertices	_____/20 (4 points per step)
Neatness/organization/effort ● Handwriting is legible (able to be read) ● Colorful illustrations ● Creative illustrations ● Name and block are written in the correct place	_____/8 (2 points per requirement)