Superhero Transformations - Handout

How algorithmic thinking can help create visual stories

Name: _____ Period: _____

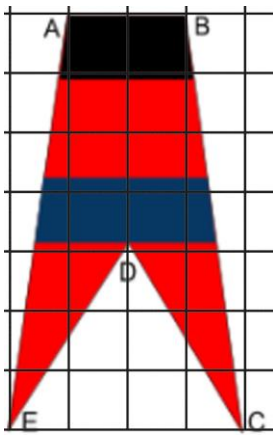
STEP 1: Take a few minutes to brainstorm a new superhero. Come up with a name for your superhero and one or two superpowers your hero has, and then sketch your superhero in the box below.

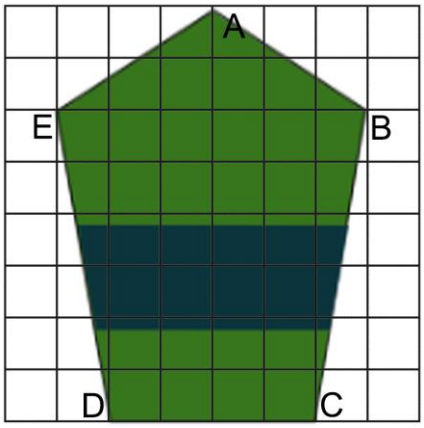
Superhero name: _____

Superpower #1: _____

Superpower #2: _____

STEP 2: Use abstraction to simplify your superhero design. Look at your design in the box above, and imagine representing that same superhero with a simple geometric shape with **five or fewer vertices**. You can use color to add some detail, too! Let's look at a couple of examples:





Now it's your turn. Your shape must use only straight lines (no curves!), and you can use at most five sides. This means you can use a triangle, a quadrilateral or a pentagon.

Draw your simplified superhero in the box to the right, and label the vertices with the letters A through E (or C or D, if you have fewer vertices). **Your vertices must land on the intersection of two grid lines**. Don't draw outside the box!

STEP 3: Choose one of the following three story ideas, then write out your story in a short paragraph using complete sentences. Keep in mind you only have four panels to tell your story in comic form, and don't forget to use your hero's superpower(s)!

Idea 1: The first day your superhero discovers their powers. Things get a little out of control!
Idea 2: A supervillain (of your own design) has kidnapped your best friend - how will your superhero free them?
Idea 3: An alien army is invading Tacoma - how will your superhero stop them and save the world?

STEP 4: Use decomposition to break your story down into four panels. Take a look at the template you will be working on, as some panels already have some scenery placed for you. Sketch your comic in the four panels on the next page, making sure you follow these requirements:

- Every panel must include your simplified geometric hero, drawn the same size in each
- Your comic can include captions and word/thought bubbles
- You should use color in the final version, but for now just use pen or pencil to create a quick sketch

STEP 5: Cut out your simplified geometric superhero from the first page and trace it into the first panel of your final comic paper. Make sure the vertices all land on the intersection of two grid lines. Write down the coordinates of each vertex of your hero below. **Hint**: in the first panel, your x-coordinates will all be negative!

A:_____ , _____ B:_____ , _____ C:_____ , _____ D:_____ , _____ E:_____ , _____

STEP 6: Use algorithmic thinking to move your superhero into the remaining three panels. For each panel, you will come up with one or more geometric transformation (translation, reflection or rotation) to get your superhero where you want them within the panel.

- You must use at least one reflection OR one rotation in your project
- You must write your steps in the table on the next page, including what transformation(s) you did and the coordinates of each vertex in each panel
- Use the cutout to help you visualize where you want your hero in each panel
- If your superhero only has three or four vertices, you won't need to fill in all five coordinate pairs

Example: To get my hero from Panel 1 to Panel 2, I...	translated by 20 units in the x-direction (right) A_2: 5 , 15 B_2: 0 , 18 C_2: -5 , 13 D_2: -9 , 4 E_2: _____ , _____
To get my hero from Panel 1 to Panel 2, I...	A_2: _____ , _____ B_2: _____ , _____ C_2: _____ , _____ D_2: _____ , _____ E_2: _____ , _____
To get my hero from Panel 2 to Panel 3, I...	A_3: _____ , _____ B_3: _____ , _____ C_3: _____ , _____ D_3: _____ , _____ E_3: _____ , _____
To get my hero from Panel 3 to Panel 4, I...	A_4: _____ , _____ B_4: _____ , _____ C_4: _____ , _____ D_4: _____ , _____ E_4: _____ , _____

STEP 7: Time to get artistic! 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

GRADING RUBRIC

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)
Comments: Total: _____/60 SBG Level: _____/4	