



Connecticut Summer STEM Challenge
Week 4 presented by: Yale's Design for America Team
Posted on August 16th, 2021. Due on August 22nd, 2021

Superhero Engineers



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Show us your research, design, and engineering skills in our Superhero challenge!

THE INDIVIDUAL CHALLENGE : Design a superhero vehicle

Imagine...

You are a brilliant engineer who designs technology for superheroes. Your new client wants you to create a superhero vehicle for them. Remember to present your idea convincingly – this superhero is picky.

Your challenge is :

- 1. Choose or make up a superhero and figure out what type of vehicle they need. SUBMIT:** a ½ page description of your superhero: their goals, the types of missions they go on, their powers, challenges they may face, and what they need a vehicle for. You may also submit an optional drawing if you want.
- 2. Design your superhero vehicle based on your description from Step 1. SUBMIT:** (1) A drawing/blueprint of your vehicle (photo of a paper drawing or a digital drawing), with specific features labeled and ½ a page explaining them. (2) A model of your vehicle made with materials you already have. Submit (a) pictures plus a ½ page description or (b) a 2-minute video showing the model and specific features.
- 3. Make a video pitch or written speech convincing your superhero that your design is exactly what they want. SUBMIT:** a 60-second video or 150-word document describing: (1) your superhero, (2) what they need a vehicle for, (3) what your design is, and (4) how it meets your superhero's needs.
- 4. Tell us about your process. SUBMIT:** ½ page telling us the inspirations behind your ideas and any challenges you had in the process that you overcame.

THE TEAM CHALLENGE : Design a superhero team base

Imagine...

The Earth is being hit by a series of disasters like wildfires, hurricanes, droughts, tornadoes, and earthquakes. An international team of superheroes has been assembled to respond to and prevent them. You're the team's brilliant engineers, and you're tasked with building the base of operations. This is a massive and expensive project, so be convincing that it's necessary the world's organizations, governments, and companies fund it.

Your challenge is :

1. Have each member of your team choose or make up a superhero and figure out what skills and powers makes each an expert in an aspect of Earth's situation. An 'aspect' doesn't have to be a category of disaster. Giving medical care to the injured is also an 'aspect'. What challenges might your superheroes face? Which superheroes can work together and how? Considering what you've learned about your team, how should the base be designed to help them live, work, and collaborate? **SUBMIT: (1)** a ½ page per person describing each superhero, and **(2)** a ½ page together describing how the superhero team works together.

2. Design your team base according to what you learned about your team from Step 1. SUBMIT: (1) One drawing/blueprint (photo of paper drawing or digital drawing) of your base, with specific features labeled and 1 page explaining them. **(2)** One model of your base made using objects you already have. Submit (a) pictures plus a 1 page description or (b) a 3-minute video showing the model and specific features.

3. Finally, make a video pitch or written speech convincing the world's organizations, governments, and companies that this base must be built. SUBMIT: a 3-minute video or 450-word written speech describing: (1) your superhero team and each superhero's role, (2) your design and how it helps your superheroes live, work, and collaborate, (3) why it's necessary that this space station is built and why your design is the best way to build it.

4. Tell us about your process. SUBMIT: ½ page telling us the inspirations behind your ideas and any challenges you had in the process that you overcame.

GENERAL NOTES :

- Finalists will be selected based on their Judging Rubric score. Our judges will then vote for a winner.
- Make sure to answer the questions posed on this document. We care about your thinking process as much as your drawings and models. Be creative and think beyond the obvious!
- The models don't have to actually work.
- Some ideas of what materials you can use for the physical model include: empty bottles and containers, tape, pen/marker/crayon, cardboard, popsicle sticks, pebbles, sticks from outdoors, etc.

Judging Rubric for the Individual Challenge.

* Points for “Going WAY above and beyond” add on top of points for “Going above and beyond”. For example, “Going WAY above and beyond” in Step #1 should earn 5+1+2=8 points.

	<u>Submitted all requirements? (15 pts max)</u>	<u>Going above and beyond. (3 extra pts max)</u>	<u>Going WAY above and beyond. (6 extra pts max)</u>
Step #1 :	<p><u>½ page description of superhero including :</u></p> <ul style="list-style-type: none"> - their goals - the missions they go on - their powers - challenges they may face - why they need a vehicle <p><u>1 pt for each bullet pt (5 max)</u></p>	<p><u>Answers consider :</u></p> <ul style="list-style-type: none"> - specific examples - don't just state the answer but explain why - anticipate new challenges the vehicle may bring <p><u>1 pt for including any considerations</u></p>	<p>This submission stands out as among the most thorough, well thought out, and creative submissions received.</p> <p><u>2 pts awarded for meeting this section.</u></p>
Step #2 :	<p><u>(1) Labeled drawing with ½ page description :</u></p> <ul style="list-style-type: none"> - complete and detailed drawing - labels on important features - ½ page describing labels <p><u>(2) Model of vehicle with either (a) pictures + ½ page description, OR (b) 2 min video</u></p> <ul style="list-style-type: none"> - photos or video of a complete and detailed model - ½ page or 2 min video describe the important parts of the model <p><u>1 pt for each bullet pt (5 max)</u></p>	<p><u>Design is detailed in a way that :</u></p> <ul style="list-style-type: none"> - describes how features could be actually built from existing technology - considers challenges that may arise in assembling/building the actual vehicle - refers back to the considerations from Step #1 <p><u>1 pt for meeting any of these points</u></p>	<p>This submission stands out as among the most thorough, well thought out, and creative submissions received.</p> <p><u>2 pts awarded for meeting this section.</u></p>
Step #3 :	<p><u>60-second video or 150 written words describing :</u></p> <ul style="list-style-type: none"> - your superhero - what they need a vehicle for - your design - why your design fits your superhero's needs - the speaking/writing is clear <p><u>1 pt for each bullet pt (5 max)</u></p>	<p><u>The presentation :</u></p> <ul style="list-style-type: none"> - the tone and contents were chosen to appeal to the target audience (the superhero's personality) - 60s/150 words is short. The most important points of the submission were selected to be featured. <p><u>1 pt for meeting any point.</u></p>	<p>This submission stands out as among the most thorough, well thought out, and creative submissions received.</p> <p><u>2 pts awarded for meeting this section.</u></p>
Step #4 :	<p><u>½ about your process :</u> Points not awarded for this, but judges will consider it when choosing between finalists.</p>		

Judging Rubric for the Team Challenge.

	<u>Submitted all requirements? (15 pts max)</u>	<u>Going above and beyond. (3 extra pts max)</u>	<u>Going WAY above and beyond. (6 extra pts max)</u>
Step #1 :	<p><u>½ page description per superhero including :</u></p> <ul style="list-style-type: none"> - the “aspect” this superhero addresses - the skills and powers that make them an expert in this “aspect” - challenges they may face on missions - how they collaborate with the team <p><u>½ page written together describing the team :</u></p> <ul style="list-style-type: none"> - shows collaboration lets the heroes do things they can’t do on their own <p><u>1 pt for each bullet pt (5 max)</u></p>	<p><u>Answers consider :</u></p> <ul style="list-style-type: none"> - specific examples - don’t just state the answer but explain why - anticipate new challenges the vehicle may bring <p><u>1 pt for including any considerations</u></p>	<p>This submission stands out as among the most thorough, well thought out, and creative submissions received.</p> <p><u>2 pts awarded for meeting this section.</u></p>
Step #2 :	<p><u>(1) Labeled drawing with 1 page description :</u></p> <ul style="list-style-type: none"> - complete and detailed drawing - labels on important features - 1 page describing labels <p><u>(2) Model of vehicle with either (a) pictures + 1 page description, OR (b) 3 min video</u></p> <ul style="list-style-type: none"> - photos or video of a complete and detailed model - 1 page or 3 min video describe the important parts of the model <p><u>1 pt for each bullet pt (5 max)</u></p>	<p><u>Design is detailed in a way that :</u></p> <ul style="list-style-type: none"> - describes how features could be actually built from existing technology - considers challenges that may arise in assembling/building the actual vehicle - refers back to the considerations from Step #1 <p><u>1 pt for meeting any of these points</u></p>	<p>This submission stands out as among the most thorough, well thought out, and creative submissions received.</p> <p><u>2 pts awarded for meeting this section.</u></p>
Step #3 :	<p><u>3 minute video or 450 written words describing :</u></p> <ul style="list-style-type: none"> - every superhero’s role in the team - your design - how it helps your team work, live, and collaborate - explains why the base must be built - the speaking/writing is clear <p><u>1 pt for each bullet pt (5 max)</u></p>	<p><u>The presentation :</u></p> <ul style="list-style-type: none"> - the tone and contents were chosen to appeal to the target audience (groups funding the base) - 3 min/450 words is short. The most important points of the submission were selected to be featured. <p><u>1 pt for meeting any point.</u></p>	<p>This submission stands out as among the most thorough, well thought out, and creative submissions received.</p> <p><u>2 pts awarded for meeting this section.</u></p>
Step #4 :	<p><u>½ about your process :</u></p> <p>Points not awarded for this, but judges will consider it when choosing between finalists.</p>		

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