Summer PPE STEM Challenge - Engineer Your Own Personal Protective Equipment Mask or Shield

Project Guidelines

**Project Overview:**
- Students will follow the Engineering Design Process to design, build, and test their own PPE face mask or shield using household materials and their own creativity.
- Students will review the “Submission Rubric” (see below). The Submission Rubric will be used by USC staff to provide feedback to the student on their project and is provided so that the student can understand how their work will be assessed.
- Students will create and submit a 1-3 minute video explaining their design process, testing, and final prototype. Videos need to follow the “Video Guidelines” (see below).
- Students will submit answers to the six “Reflection Questions” (see below).
- Students will submit a signed Image Release Form and Waiver and Liability Form (both found on website).
- Students will submit their project anytime between July 13, 2020 and July 24, 2020, 11:59PM PDT.
- Top submissions will be shared on the USC Viterbi K-12 STEM Center website and social media channels (unless you opt out of this choice).

**Reflection Questions:**
Prepare these answers prior to submitting your entry so that you may cut and paste information directly into the submission form. 1-4 sentences for each question is fine.

1. **Define the problem.**
   Identify the need or problem that you were trying to solve.

2. **What type of research did you conduct?**
   Provide a summary of the background information you gathered. Provide a short list of your primary resources.

3. **What was your prediction?**
   What were some of your possible solutions? Share some of your brainstorming ideas or models. What criteria did you use that helped you select your final design/prototype?

4. **What procedure did you use to test your design?**
   Describe in detail the materials and procedures used to collect data and make observations to assess the efficiency of your design. Explain any safety precautions you took.

5. **How did you collect and analyze your data?**
   Describe method for collecting and analyzing data.

6. **What was your conclusion?**
   Explain how your design addressed the problem defined. Your conclusion must be clear and demonstrate logical reasoning of your observations. Discuss any possible improvements that you would make if you repeated the project. Share any challenges during the process.
Video Guidelines:

- Summary of your experience in designing, building and testing your PPE. This can include a visual demonstration of how your testing was conducted and the data you collected; your observations; your final design or prototype; and final conclusion. Your video can include photos, text, or non-copyrighted music.
- Video must be 1-3 minutes in length.
- **Do not include your name, phone number or email address (your “Personal Information”) in your video.**
- Video must be truthful and your original work.
- Video may not promote any activity that may appear unsafe or dangerous.
- Video must not contain material that is inappropriate, offensive, indecent, obscene, tortious, defamatory, slanderous or libelous.
- Video must not contain material that violates or infringes another’s rights, including but not limited to privacy, publicity or intellectual property rights, or that constitutes copyright infringement.

Video upload:

- In preparation for submission of a video, the Parent of the Student must first create a registered user account at [www.youtube.com](http://www.youtube.com) and agree to all applicable terms at that site. There is no fee or charge to become a registered user of YouTube. YouTube is not a host of this Challenge, nor does it endorse or administer the Challenge. Further, submissions which do not comply with the YouTube Community Guidelines will be disqualified. Video file size limitation and file format must follow YouTube specifications. Videos may not be submitted in any other format or through any other digital channel.
- Next, the Student’s Parent must access their YouTube account, upload the entry video, title the video “Summer PPE STEM Challenge - [Your title]”, set the video’s privacy settings to “Unlisted”, note the unique URL (link) that YouTube has given the video, and provide the URL (link) on the submission form located on the website.

Submission Rubric

This is provided for your information only. You do not need to fill this out.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Possible points</th>
<th>Student’s points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the video clear, creative, engaging, and between 1-3 minutes in length?</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Was the need or problem clearly defined?</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Did their prediction or possible solution reflect a thoughtful approach in solving the problem? Did they share the criteria they used to select their prototype’s design? Did they use or develop models?</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Were the materials used appropriate and clearly described?</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
Does the investigation method help them determine whether their PPE solved the defined problem? | 1 |
---|---|
Is the data collection and analysis explained? Do they relate how data was used to assess efficiency of design? | 1 |
Did they communicate their conclusion based on the analysis of their data? Did they describe or suggest ideas for a better solution? | 1 |
Total | 7 |
Comments/Feedback:

**Scoring guide:**

0= Does not address the question
0.5= Addresses the questions but is missing components
1= Addressed the question thoroughly

*If you have any questions regarding the project or project guidelines, please contact the program manager, Maria Madrigal, at mmdrig@usc.edu or Mary Bonaparte-Saller at kbonapart@usc.edu.*