

**Title: Product Design: Construction Technology Engineering**

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**Subject Area/ Grade: Industrial Design/ 11th - 12th Grade**

In this industrial design project, students will research and design a device or product for physical or mental illness or disability.

### **Goals**

- Researching and designing products for either COVID19 PPE or a device/product used for a physical or mental illness or disability.
- Brainstorm, research and design 4 different designs of a product that benefits the target consumer given their symptoms and/or disability.
- For those selecting COVID19, you can design products for both frontline workers as well as everyday citizens for home and/or commercial use.
- Responsible for all documentation including photos of drawings, design briefs and citing of sources of your research.

### **Content Area and Standards**

- Product Design CTE (Construction Technology Engineering)
- Generate and document multiple ideas or solution paths to a problem through brainstorming.
- Describe the design process used in the solution of a particular problem and reflect on all steps of the design process.
- Utilize an engineering notebook to clearly and accurately document the design process according to accepted standards and protocols to prove the origin and chronology of a design.
- Create sketches or diagrams as representations of objects, ideas, events, or systems.
- Explain the contributions of engineers from different engineering fields in the design and development of a product, system, or technology.
- Review and evaluate the written work of peers and make recommendations for improvement.

### **Activity**

- Mind Map: Centering your topic, research and brainstorm 4 ideas for possible product design solutions that relate to your topic. Final Mind Map can contain brief notes and thumbnail sketches if needed.
- Design Briefs: Create and complete a design brief in the proper format for

every product design solution. \*You must list at least 5 criteria and 5 constraints including the following criteria: Does the needed technology already exist?

- Ideation Drawings: Create a set of ideation drawings for each of your product designs. Shading and color is encouraged.
- Concept Drawings: Create a set of concept sketches for each of your product designs. Remember to align your views and neatly annotate as much information as possible.
- Final Drawings: Final presentation drawings should contain at least one perspective view w/background shape, cast or drop shadow. Shading and color is encouraged. Additional views from different perspectives can be added at your discretion.

## **Joy2Learn Artists /Videos that Support Project**

- Elizabeth Murray, My Ambitions
- Frank Gehry, My Son and I
- Richard Serra, My Life, Little Richard

## **Art Forms that May Be Included**

Product Design drawings created with various media including pen, pencil marker, charcoal & prototype model created with foam or balsa wood

## **Connections to Students Passion Areas and Interests**

- Students have the choice to design a product that addresses a physical or mental disability or address a current and somewhat urgent need in the form of COVID PPE products.
- Students submit their final work in the form of a sales pitch to their peers and address questions (remote or in-person)

## **Materials Needed**

Paper (heavyweight), pencils, pens, internet access for research and work sharing purposes.

## **Collaborators**

Ideal collaborators would be frontline workers as well as specialists and doctors depending on disability

## Assessment

Elements Weight 5 Points 4 Points 3 Points 2 Points 1-0 Points Total

### Presentation Rubric

Elements	Weight	5 Points	4 Points	3 Points	2 Points	1-0 Points	Total
Content		The information included is accurate and completely addresses each component of the assigned topic or research question.	The information included adequately addresses each component of the assigned topic or research question.	The information included inadequately addresses the assigned topic or research question. The information included is sometimes inaccurate.	The information included does not address the assigned topic or research.	There is no evidence of accurate content information.	
Delivery		The presenter effectively and creatively delivers the information while staying on topic. The presenter appears relaxed and self-confident. Body language, voice modulation, and eye contact are effectively used.	The presenter adequately delivers the information while staying on topic. The presenter appears relaxed and self-confident. Body language, voice modulation, and eye contact are mostly appropriate.	The presenter delivers the information but does not stay on topic. The presenter appears tense or nervous. Body language, voice modulation, and eye contact are inappropriate or lacking.	The presenter omits important information and does not stay on topic. The presenter appears tense or nervous. Body language, voice modulation, and eye contact are inappropriate or lacking.	The presenter does not effectively deliver the necessary information.	
Organization		The presentation content has been organized using a logical sequence. The presentation is engaging and effective.	The presentation content has been mostly organized using a logical sequence, but some flaws exist. The presentation is adequate.	The presentation content has been organized using a somewhat logical sequence. The presentation is sometimes confusing.	The presentation content is disorganized, unclear, or confusing. The presentation is not adequate.	The presentation does not include evidence of organization.	
Preparation		Presentation indicates detailed preparation.	Presentation indicates adequate preparation.	Presentation indicates minimal preparation.	Presentation indicates a lack of preparation.	Presentation shows no evidence of preparation.	

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Visual Aids		Visual aids are of excellent quality, easy to read, and relevant to the presentation. Visuals of all required elements are present.	Visual aids are adequate, easy to read, and relevant to the presentation. Visuals of all required elements are present.	Visual aids are somewhat effective but may include vocabulary or spelling errors. Visuals of all required elements are present.	Visual aids lack effectiveness. Aids may lack appropriate content. Aids include multiple vocabulary or spelling errors. Visuals of all required elements are not present.	The presentation shows no evidence of visual aids.	
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## Concept Sketching Rubric

Elements	Weight	5 Points	4 Points	3 Points	2 Points	1–0 Points	Total
<b>Proportions</b>		Proportions of the sketch mirror the size and shape of sketched object.	Proportions of the sketch closely resemble the size and shape of the sketched object but the sketch looks slightly distorted.	Proportions of the sketch somewhat resemble the size and shape of the sketched object. There are obvious indications that the sketcher created guidelines to attempt to establish proper proportions.	The sketch is disproportional to the object being sketched. Some indications that the sketcher attempted to provide guidelines to establish proper proportions.	No evidence that proper proportions were attempted	
<b>Attention to Detail</b>		The sketch shows great attention to detail and is a realistic representation of the object.	The sketch contains many strong elements of detail but some details are missing.	The sketch shows detail that is reflective of the object but needs further refinement and fine-tuning to appear realistic.	The sketch is lacking detail. The detail included is not reflective of the object and is incomplete.	No evidence of detail in the sketch.	
<b>Shading</b>		The sketch has strong, well-done shading that displays good use of value to represent the color(s) of the object and creates a realistic and three-dimensional appearance.	The sketch has strong, well-done shading that displays good use of value to represent color(s), but additional shading is necessary to show shadows and create a more realistic and three-dimensional appearance.	The sketch is shaded but does not represent the color(s) of the object nor the shadows that create a realistic three-dimensional appearance.	Minimal shading is incorporated in the sketch.	No evidence of shading in the sketch.	
<b>Neatness</b>			Clean, neat pages with no smudges.	Neat work with some smudges.	Poor appearance.	Messy with food or other stains.	

### Timeline

4-6 weeks (1 1/2hr period class every other day with approx. 20 minutes a night of asynchronous work)