Engineering Design Process Assignment

Working from home doesn't mean you can't solve cool problems! Take some time to identify a real-world problem and work through an engineering solution to it!

PART 1: IDENTIFY A PROBLEM

Look around you (wherever you are) and find something annoying, old, or frustrating. These things are often called "Pain Points". Find one around you that is interesting and reasonably complex. You'll address that problem throughout this makeup work – so choose wisely!

For the problem you chose, DEFINE THE PROBLEM by filling out the design brief below. The design should focus on the problem and a potential redesign or solution to that problem. Take your time and make a good design brief!

Define and justify the problem (3 sentences)	
Criteria for success (at least 5)	
Constraints on a solution (at least 5)	
Audience & Scope	
Deadline (How long do you think it would take to make a solution?)	

PART 2: RESEARCH & BRAINSTORM

We know that researching & brainstorming is an important part of the engineering design process. Here you need to talk to three people to research what they think about the problem, and then do some real brainstorming for possible solutions to the problem you defined in part 1.

Try and talk to at least 3 other people about your idea. If you aren't around 3 people regularly at home, then you can talk to someone on the phone or by e-mail. If that doesn't work, make sure you talk to at least 1 other person. Ask them what they think about the problem, what possible challenges might be to solving it, and what possible solutions might look like. Record their feedback below:

Name:	Name:	Name:
Feedback:	Feedback:	Feedback:

Now it's time to do your brainstorming. Take some time and brainstorm at least 20 different possible solutions (some can of course be silly) to your problem. Feel free to include some sketches of your brainstormed ideas. Record all your ideas below:

PART 3: PICK A SOLUTION

Now you need to decide which idea is the best. Use the grid below to make a DECISION MATRIX, and then ask as many people as you can to rate your ideas. Do this by listing your four most important criteria in the criteria column. Then, list your 4 best ideas (from your brainstorming) in the Ideas row. Then have other people rate each idea based on the listed criteria.

	Idea 1	Idea 2	Idea 3	Idea 4
Criteria 1				
Criteria 2				
Criteria 3				
Criteria 4				
TOTAL				

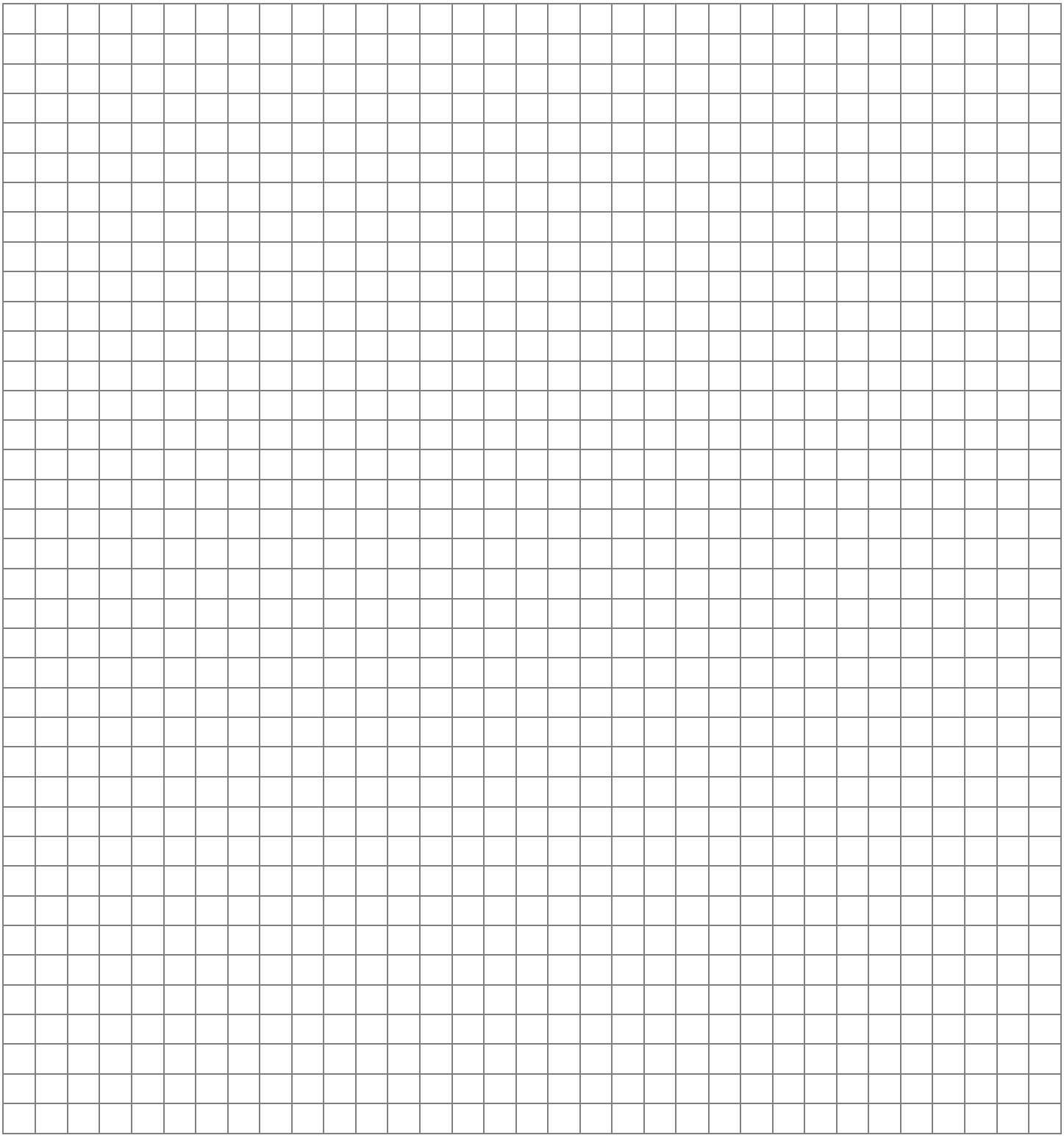
When you're done having people rate each idea, add up each column to get totals for each idea. List those totals in the "TOTAL" row.

Which idea got the highest score? Why do you think that is?

STEP 4: PROTOTYPING

Of course you don't have to build your idea while you're at home. That would be ridiculous. But you CAN draw and design it. In the space below, make three very careful drawings of your chosen solution. Your drawings should show at least two different views of the solution, and at least one drawing of your solution actually being used!

Your drawings should be carefully done, should be reasonably to scale, and should include lots of labels to show what things are and what they're made of. This should be a drawing so detailed that you could show it to a classmate (or Mr. Benshoof) and they immediately understand the whole idea!



STEP 5: TEST & EVALUATE

Next, you need to see how good your idea probably is. Since you've got it nailed down, go and find some people (they could be the same people that you got your research information from if you want), and share the details of your idea with them. Record their specific feedback below, and make sure to get at least one positive idea from them, and at least one idea for an improvement!

	Feedback
Name:	
Name:	
Name:	

STEP 6: COMMUNICATE

Share your work with someone around you! When we meet for class next week, we'll ask you to share your idea briefly with the Zoom group (if you can make it. If you don't want to share, that's okay too).