Names\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Project 1: Solar Oven Design**

Introduction

You and a partner will design a solar oven.

Equipment

* Engineering notebook
* Graph paper
* Computer for Internet research
* Measuring tools, yardstick, meter stick, ruler, tape measure
* Cardboard
* Suran Wrap
* Tinfoil
* Tape
* Black Paper
* Anything from home you would like to use in it. Magnifying glass, mirrors, etc.

*Engineering Design Process*

1. Identify & define the design problem
2. Brainstorm solutions
3. Create models & build a prototype
4. Test the prototype
5. Redesign and optimize

**Steps**

1. One way to **Identify & Define a Problem** is to use a design brief.

In your notebook include all the essential elements of a good design brief:

* Objectives and goals of the new design
* Budget and schedule
* Target audience
* Available materials/required materials
* Overall style/look
* Any definite “Do nots”

1. Now you need to Brainstorm Solutions. Sketch 5 ideas **on your own**.
2. Come together and fill out a matrix template.
3. The next step is to **Create a Model**. Use graph paper to create an orthographic projection of your plan.
4. Finally **Build your Prototype**.
5. **Test the Prototype** by taking it outside and taking a few temperatures.
6. **Redesign and optimize.** Make any changes you see need.
7. Each person answer the conclusion questions and turn them in the basket.

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Matrix Template**

1. In the criteria boxes list the criteria from your design brief.
2. Under the ideas boxes put your 3 ideas and your partners 3 ideas – label the sketches A, B, C, D, E, and F.
3. Evaluate the design idea for each criteria, giving it a value between 1 and 4, 1 means it doesn’t meet this criteria, 4 means this is the best possible solution to the problem for this specific need.
4. If your criteria is a question, use 1 if the answer is no, 2 if the answer is yes.
5. When you finish evaluating your sketches add the numbers across and put your answer in the Total column.
6. The design with the highest total is your Best Solution**.**

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Criteria | | | | | |  |
| Ideas |  |  |  |  |  |  | Totals |
| A  Designed by: |  |  |  |  |  |  |  |
| B  Designed by: |  |  |  |  |  |  |  |
| C  Designed by: |  |  |  |  |  |  |  |
| D  Designed by: |  |  |  |  |  |  |  |
| **E**  Designed by: |  |  |  |  |  |  |  |
| **F**  Designed by: |  |  |  |  |  |  |  |