Cardboard Tower Design Notebook

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# Instructions

The following are the instructions for completing this design notebook:

* You must document EVERYTHING
* Entries should be made by every team member (not just one person), initialed, and dated.
* All designs and changes to your design should be recorded directly into your notebook. The inclusion of all elaborate details and sketches are preferable.
* Notes and calculations should be inserted into your notebook, NOT only on loose paper.
* In the case of an error, draw a single line through the incorrect data. Do NOT erase or use correction fluid. All corrections should be initialed and dated. Use both sides of a page. Never leave any white space: “X” out or Crosshatch all unused space, and don’t forget to initial and date. To insert pictures or outside information into your notebook, tape the picture into your notebook and outline with permanent ink, to note that it was there in case it falls out.
* Pictures or sketches of your design throughout the process are not just recommended, it is required.
* Include contact information of any outside advisors so that you can easily contact them again (even when you just drop by your professor’s office to ask a quick question).

# Proof of Concept

## Problem Re-Statement (Recognize the Need)

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| --- |
| * In your own words, provide a brief discussion of why we are doing this project. |
| This project, while teaching us about the basic of statics is valuable in the experience we get as designing a project as a team. This project is teaching us the valuable design process and skills needed for a team to successfully plan, build, and complete a large-scale project effectively as a team. This is the penultimate experience we believe we should take away from this project. |

## Problem Scoping (Define the Problem)

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| --- |
| * What are the objectives? * What does this project need to do? Or not do? * What variables do we need to consider? * What questions do you need answered to ensure that you understand how to complete this design? |
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## Project Constraints (Research and Prepare)

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| * What are the technical requirements? |
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| * What are the material requirements? |
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| * What do we know about things that already exist that do this? * What kinds of things already exist that meet similar requirements? * Reverse engineer one or more of these things. How might it be useful to complete this project? * Use additional pages as necessary |
|  |
| * What are the limitations we have based on our available materials? |
|  |

## Identify Possible Design Solutions (Conceptualize Part 1)

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| --- |
| Possible Design Solution 1  * *Draw your design idea* * *Why do you think it will work?* * *Look around you, what do you see that is similar and might work?* * *Justify your idea. (Use additional pages as necessary)* |
|  |
| Possible Design Solution 2  * *Draw your design idea* * *Why do you think it will work?* * *Look around you, what do you see that is similar and might work?* * *Justify your idea. (Use additional pages as necessary)* |
|  |

## Evaluate Design Strategies (Conceptualization Part 2)

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| --- |
| * Which design will do a better job meeting the goals based on the given criteria? * What components are necessary for completing each design? * How did you come to your decision? * What design idea can be completed in the time frame? * What design idea can be completed with the budget? * What design idea can be completed with the materials? * Use additional pages as necessary |
|  |

## First Cut of the design (Synthesis Part 1)

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| --- |
| * Think about the materials involved:   + What testing do we need to do to ensure that these materials work?   + What do we know about the materials we have?   + What do we know about the nature of what we are about to build?   + What details do we need to input and consider?   + Provide a materials list (specify amounts needed) * Provide a detailed drawing (size and tolerances) of the projected build * Provide a detailed time line for completion of the project * Use additional pages as necessary |
|  |

## Model (Synthesis Part 2)

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| --- |
| * Using your engineering knowledge, show that your design will work. * Math, Physics, Chemistry, Other engineering knowledge * Justify the design and prove that it can be built. * Use additional pages as necessary |
|  |

## Validate Calculations (Evaluation)

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| * Do my model calculations make sense? Why? * Are there other considerations I need to address? What are they? * Did I identify the critical design parameters? |
|  |

## Optimization

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| * Can I create a better design? * Can I improve on any of the criteria? |
|  |

# Design Demonstration Documentation

## Document Build (Presentation Part 1)

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| * Use photographs and narrative to explain your building process. * Include documentation of any changes in the design during the build process * Include any interim test data, thoughts, etc. * Use additional pages as necessary |
|  |

## Show Completed Construction (Presentation Part 2)

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| --- |
| * Insert an image of completed build * Provide a demonstration that the design worked   + Photographs   + Collected data   + Videos, etc. |
|  |

# Lessons Learned

|  |
| --- |
| * Provide a discussion of the major lessons learned during this design process (each team member must provide an entry)   + About design   + About project management   + About working with a team |
|  |