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|  | WSMS Gateway |  |  |

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| **Egg Drop**  |

Introduction

Eggshells are remarkably strong. If you hold an egg in the palm of your hand and try to crush it by wrapping you fingers around it and squeezing, you will find that it takes a large force to crack the shell. However, the shell can be broken rather effortlessly by hitting a small area with a hard object. This is why it does not take much effort to crack open an egg for cooking, and why they break so easily when dropped.

You and your teammates must design and build a “pod” to protect an egg from freefall. In the event that multiple eggs survive, the group that lands closest to the designated target will win.

Constraints

* Only the materials listed below may be used
* Your design must be smaller than 12”x12”x12”
* The egg must survive a fall from the stadium bleachers
* Easy placement and removal of the egg for testing
* A “protected” egg will be defined as not having any cracks, breaks, chips, or blemish of any kind



Available Materials

* 15 sheets of paper
* 20 straws
* 10 rubber bands
* 60” of string
* 60” of masking tape
* 1 item from home
	+ Must get approval from Mr. Crocker

Procedure

* Fill out your Design Brief
* Use a decision matrix to decide which solution is the best
* Sketch and dimension the different views of each part in your engineering notebook
* Convert these sketches into individual part files
* Assemble all parts into a final model
* Build your prototype in the workshop
* Test your design

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| **Egg Drop Design Brief**  |

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| Client: |  |
| Designer: |  |
| Problem Statement: |  |
| Design Statement:(What you will be doing) |  |
| Constraints:(Guidelines and limitations) |  |
| Deliverables:(What to turn in) | * Fully assembled Inventor model
* Sketches in engineering notebook
* Physical prototype
* Conclusion questions
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| **Egg Drop Decision Matrix**  |

1. In the criteria boxes list the criteria from the design brief, as well as criteria you come up with.
2. Under the ideas boxes put your 3 ideas for possible “pods”.
3. Evaluate the design idea for all criteria. For a yes or no response to the criteria, use 1 if the answer is no, 2 if the answer is yes. When assessing a criteria, use the scale between 1 and 4, 1 -2 means it almost or definitely does not meet this criteria, 3 - 4 means it almost or definitely is the best possible solution to the problem for this specific need.
4. When you finish evaluating your sketches, add the numbers across and put your answer in the Total column.
5. The design with the highest total is your Best Solution.

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|  | Criteria |  |
| Ideas |  |  |  |  |  |  | Totals |
| A: |  |  |  |  |  |  |  |
| B: |  |  |  |  |  |  |  |
| C: |  |  |  |  |  |  |  |
| D: |  |  |  |  |  |  |  |

Conclusion

1. What was the most difficult part of the design process? Why?
2. Explain why your final design was chosen over other options?
3. What was the biggest problem you ran into? How did you solve it?
4. What would you do differently if you started over?
5. What other materials would you have liked to use? Why?