***Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Partner:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***

**Emergency Medicine Air-Drop**

**Problem:**There is a terrible drought in East Africa. The United Nations is working to get vitally needed medications into the refugee camps. It takes too long and it is too dangerous to bring the medications in by truck. It is also considered too dangerous to land a plane so it has been decided that the medications will be air-dropped. You are part of a team of engineers who have been asked to design a container that will protect the medications as they fall to the ground.



**Scenario:**
You will model this problem using a raw egg. There are some volume and mass restrictions for the container and height requirements for the drop. It will be important to work well with your team in analyzing the problem, completing research/considering your constraints, designing/building/testing your container, and analyzing your results.

**Procedure:**
You will be assigned a team (partner). Your design must not include changing the egg in any way (no tape on the egg, no nail polish, no hollow eggs, no hard-boiled eggs, etc….). You will complete the following lab report pages and produce a final product to demonstrate/describe your work.

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*Scientific Process NAME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*Egg Drop Project*

*Post-Analysis*

*Please write in* ***complete sentences*** *and be as* ***detailed*** *as possible!*

1. *What do you think was the overall purpose of this project?*
2. *WRITE ONE SENTENCE that is an overall summary of what your group discovered in relation to* ***Newton’s Laws of Motion.*** *Review your activity packet or past class materials, if necessary.*
3. *WRITE ONE SENTENCE that is an overall summary of what your group discovered in relation to the idea of* ***momentum****. Review your activity packet or past class materials, if necessary.*

1. *WRITE ONE PARAGRAPH (3-5 sentences) describing the procedure you followed during this project. Make sure to* ***use enough detail*** *about your materials and methods that someone else could repeat your procedure.*
2. *WRITE ONE PARAGRAPH (3-5 sentences) that describes the hypothesis you used, what things you controlled, what the independent variable(s) was/were, and what the dependent variable was.*
3. *WRITE ONE PARAGRAPH (3-5 sentences) that describe any problems or errors you had and any suggestions for improving your final product.*
4. *WRITE ONE PARAGRAPH (3-5 sentences) that describes your results compared to other groups. Make sure to include information regarding other groups designs (good or bad) that you believe led to their particular result.*

*Scientific Process Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*Project Personal Reflection*

1. *How well did your group work together? Provide evidence for your response.*
2. *What went well? Why did it go well?*

1. *What could be improved on? Briefly discuss how you could have improved it.*
2. *Did everyone in your group participate? Provide evidence for your response.*

1. *Using a scale of 1-5, with one being the lowest and 5 the highest, rate the members of your group (including yourself) on their participation.*

*Partner Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Their Ranking \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*Your Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Your Ranking \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

1. *What was successful in the design of your container? Why do you think it was successful?*
2. *What would you change if you did this project again?*

***Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Partner:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Categories* | ***Excellent******4 pts*** | ***Good******3 pts*** | ***Fair******2 pts*** | ***Poor******1 pts*** |
| *Brainstorming/Planning* | *Team brainstormed several good ideas, considered many different approaches to meet the criteria. engaged in analysis, and selected an effective construction plan* | *Team clearly brainstormed, considered the criteria, and analyzed several plans before selecting construction plan.* | *There is some evidence of brainstorming and planning, but all of the ideas seem very similar to one another.*  | *No evidence that the team brainstormed and/or did any planning.*  |
| *Materials* | *Student followed all directions and only used materials that were on the approved list.* | *N/A* | *Student did not follow directions* ***OR*** *used materials that were not on approved list.*  | *Student did not follow directions* ***AND*** *used materials that were not on approved list.*  |
| *Construction*  | *Great care taken in construction process so that the structure is neat, attractive and follows plans accurately.* | *Construction was careful and accurate for the most part, but 1-2 details could have been refined for a more attractive product.* | *Construction accurately followed the plans, but 3-4 details could have been refined for a more attractive product.* | *Construction appears careless or haphazard. Many details need refinement for a strong or attractive product.* |
| *Analysis & Re-design* | *Students thoughtfully answered questions #3 & #6 in their packets. There is evidence that there were changes made to the design based upon the test results.*  | *Students answered questions #3 & #6 in their packets. The changes made to the design based upon the test results were minimal.*  | *Students answered questions #3 & #6 in their packets. There were no changes made to the design based upon the test results.*  | *Students did not answer questions #3 & #6 in their packets* ***AND*** *there were no changes made to the design based upon the test results.*  |
| ***21st Century Employability Skills*** | *Student was on-task and engaged during entire activity. Student also worked collaboratively with his/her partner to solve problems.* | *Student was engaged most of the time and sometimes worked collaboratively with his/her partner.*  | *Student was either distracted often OR had to be reminded more than once to work collaboratively with his/her partner.* | *Student distracted much of the time and not engaged. His/her partner had to do all the work.* |
| *Egg survival* | *Egg remains in project and has no cracks.* | *Egg remains in the project and egg is has some cracks in the shell but nothing is leaking out.* | *Egg might have come out of the project AND/OR the egg is leaking but not totally broken.* | *Egg came totally out of the project OR the egg is severely broken to total smashed* |
| ***Final Analysis & Reflection*** | *Student completed the reflection and analysis questions accurately and with lots of details.*  | *Student completed the reflection and analysis questions accurately but there are some details missing.*  | *Student completed the reflection and analysis questions but there are answers that don’t make sense* ***AND*** *details that are missing.*  | *Student either didn’t complete the reflection and analysis questions* ***OR*** *none of the answers relate to the project we have just completed.*  |