**Discover, Design, Build - Science, Technology, Engineering, Art, and Math**

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**Screaming Egg**

**Description:**

In this unit, students must devise a device that will catch a free-falling egg (from the balcony). You should use the design process and plan on multiple revisions to design the best possible device. Scores will be based on the height of the landing pad.

You will work in teams of 2-3 over 6 class periods.

* think creatively and apply the design process to solve problems.
* collaborate with peers and mentors.
* design, construct, test, and revise prototypes.
* critique the work of others productively.
* respond to feedback and challenges to make improvements.
* communicate ideas visually and verbally.

**Parameters**:

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| Raw chicken eggs will be used. Teacher provided. |
| Nothing can be attached directly to the egg. |
| The smaller the vertical height of the landing pad, the more points awarded. |
| One team member will drop the egg. Plumb-bobs and other aiming devices are allowed. |
| Aesthetics are not a grading factor, but workmanship is. |
| Students are responsible for cleanup of any broken egg. |
| Students may test their landing pad as many times as they wish, but must replace broken eggs and clean up after each test. |
| Only the scores from the FINAL egg drop will be recorded. |
| Students may use any materials they wish, but must locate all materials themselves, or use teacher-provided material. The teacher will not be acquiring specific materials based upon student requests. |

**Procedures:**

Day 1: Discuss conservation of energy. Define the problem. Brainstorm strategies.

Day 2: Research. Brainstorm, evaluate, sketch.

Day 3: Construction, testing prototypes, redesigning.

Day 4: Evaluate and rebuild.

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| topic | 0 - not attempted | 2 - poor | 3 - needs some work | 4 - good | 5 - outstanding |
| design process | minimal or no effort made | Students made little attempt to follow the design process. | Student documented some parts of the design process. May have skipped parts. | Students followed and documented all parts of the design process | Student used the repetitive nature of the design process to improve their project to achieve excellence |
| prototyping | minimal or no effort made | prototypes were attempted but were unrealistic or not intended to improve the design process. | prototypes were attempted, but little attention was paid to lessons learned | at least 2 prototypes were built and tested | Many rounds of prototyping took place which incorporated solutions to specific problems. |
| collaboration | minimal or no effort made | students did not function as a team | one student may have dominated the team or students worked independently of each other | students appeared to operate as a team - both members contributing | students encourage each other to achieve in ways that they would not have alone |
| present & critique | minimal or no effort made | both the critique and the presentation were unclear or lacking coherence | either the critique or the presentation was unclear or lacking coherence | both students presented to the group clearly and offered productive critiques of others | presentation was excellent **and** critiques were inciteful |
| respond to feedback | minimal or no effort made | students did not use feedback and did not improve their project | students may have improved their project but did not use feedback | students used feedback to improve their project | students used feedback to identify their own strengths and weaknesses and used this reflection to improve |
| communication | minimal or no effort made | in the second trial, one or both replicas had little similarity to the original  | in the second trial, one or both replicas had significant errors | in the second trial, one or both replicas had minor errors | in the second trial, both members of the team created a perfect replica of the object |

TOTAL POINTS \_\_\_\_