## Gennrich Science Lesson 2

### Context Issues of the Lesson

<table>
<thead>
<tr>
<th>Unit or Lesson Title:</th>
<th>Egg Drop</th>
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<tbody>
<tr>
<td><strong>Grade Level</strong></td>
<td>3rd</td>
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<tr>
<td><strong>Topic/Theme/Nature of the Investigation:</strong></td>
<td>Students through the use of engineering practices will model a design using a collection of supplied materials to keep an egg from breaking as it dropped from increasingly higher distances.</td>
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<tr>
<td><strong>NGSS Performance Expectation(s)</strong></td>
<td>3-PS2-1. Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.</td>
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</table>
| **NGSS Dimension 1 component** | 1. Asking Questions (for science) and Defining Problems (for engineering)  
3. Planning and Carrying Out Investigations |
| **NGSS Dimension 2 component** | PS2.A: Forces and Motion  
PS2.B: Types of Interactions |
| **NGSS Dimension 3 component** | Cause and Effect  
Cause and effect relationships are routinely identified. (3-PS2-1)  
Cause and effect relationships are routinely identified, tested, and used to explain change. (3-PS2-3)  
**Interdependence of Science, Engineering, and Technology**  
Scientific discoveries about the natural world can often lead to new and improved technologies, which are developed through the engineering design process. (3-PS2-4) |
| **Duration:** | An entire afternoon dedicated to science (2.5-3.0 hrs) |
## Planning Stages Within the 5-E Inquiry Model

### Engage

**PURPOSE:**
- to convey the context of the lesson(s)/unit by conveying an important Key Question
- to engage students in investigations that reveal their thinking to themselves and the teacher
- to record the initial ideas of students
- to engage their interest

**What is the teacher doing? What are the students doing?**

1. Students will be broken up in heterogeneous groups. I had 6 groups of 4 students each. All materials will be divided out into six equal groupings. There will be 25 rubber bands, 2 rolls of paper towel, a roll of masking tape, 25 cotton balls, and 25 tooth picks. Students will meet down to conference with the teacher on the objective, the structure of the lesson, and what is expected of them. My intentions of this lab, was to use it as an engaging introduction into our unit on forces. So we discuss what happens when an egg is dropped and why it drops. I demonstrated dropping the egg onto a garbage bag. Then the teacher can ask is there a way to prevent the egg from dropping. At that point, students are defining problems and asking themselves questions of how to solve the problem at hand. Then students will be put into the predetermined groups and begin designing and building their model. I had students draw out a plan, before they were allowed to begin assembling their model. After students have created their model, they will test it from increasing heights. Students will then write/journal about their experience and how they think they could improve/modify their model in the future.

### Explore

**PURPOSE:**
- to test ideas and develop knowledge using explorations, investigations, experiments
- to modify and record ideas as they change due to activities
- to develop new questions and testable hypotheses

**Activities (list)**

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<th>Activities (list)</th>
<th>Driving Question</th>
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<tr>
<td>Design a model that protects an egg from breaking</td>
<td>What design can prevent an egg from breaking?</td>
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**Student Communication Product:** (written report, oral presentation, poster, etc.)

(consider showing “Models” of student products to help student identify characteristics of quality)

Written report and oral presentation after completing activity. Drawing an example of the design before beginning assembly.

### Explain

**PURPOSE:**
- to answer the Key Question through student explanations
- to provide students with relevant vocabulary, formal definitions and explanations of concepts

**Content Media:** (written material, video, teacher lecture, technology)

Teacher lecture and materials
Student Communication Product: (assessment, unit test, written report, oral presentation, poster, etc.)

Oral presentation and written report/reflection

Elaborate

PURPOSE:
- to extend students' conceptual understanding through application or practice in new settings

Activities:

Students will discuss through presentation and written work how their model could be improved. Including adding different materials then the objects given to them. They will be able to discuss/write what materials may do a better job to protect their egg.

Content Media: (written material, video, teacher lecture, technology)

n/a

Extending/Application Questions for Whole/Small Group Discourse:

In order to improve your model and in addition to perhaps changing your design, what other materials could be used that would lead to improvements.

Student Communication Product (assessment): (unit test, written report, oral presentation, poster, etc.)
Oral presentations and written reflections from each group to the class after the activity is completed.

### Evaluate

**PURPOSE:**

For students to understand the importance of the concept of modeling solutions to problems and realizing that more than one good solution may exist to a given problem.

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<th>Skill/Reasoning Learning Objectives</th>
<th>Assessment Instrument</th>
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<td>To have students learn about contact and non-contact forces such as gravity.</td>
<td>The model that has been designed in each group using like parts/materials.</td>
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<th>Knowledge Learning Objectives</th>
<th>Assessment Instrument</th>
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<td>To have students be able to create a solution using thoughtful creativity and understanding of the concepts that cause the problem and the effect they can have with their solution.</td>
<td>The model that has been designed in each group using like parts/materials. As well as the post-reflection, in which students are asked to make improvements, with design and/or materials.</td>
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