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| **Lesson Title:** Save the Eggs!!! | |  |
| **Grade Level: 2** | **Quarter: 4** |
| **Standards:** *List relevant STEM – Science, Technology, & Math standards. Include ELA CCGPS if applicable.*  **S2L1 Students will investigate the life cycles of different living organisms**.   1. Determine the sequence of the life cycle of common animals in your area: a mammal such as a cat or dog or   classroom pet, a bird such as a chicken, an amphibian such as a frog, and an insect such as a butterfly. | | |
| **Lesson Essential Question:**  **How can I protect an egg in the first stage of its life cycle?** | **Vocabulary:**   * Life cycle * Embryo * egg | |
| **Lesson Materials**   * *Scrambled Egg Super* by Dr. Seuss * *Lifecycles: From Egg to Chicken* by Gerald Legg * For each pair of students * 20 plastic nonflexible straws * 1 meter of masking tape * Scissors * 1 raw egg in a plastic bag | **Lesson Assessment:** | |
| **STEM Challenge Overview:**  Peter T. Hooper needs your help protecting the eggs of the Long-Legger Kwong as they lay their eggs 20 feet in the air. You will use the materials provided to construct a device to protect eggs that are dropped from that height. | | |
| **Teacher Background:**  One of the most important principles in biology is the life cycle. All living organisms from the most simple to the complex go through life stages starting with their own birth to the birth of the next generation. Although the details differ for different organisms, they all pass through distinct life stages in which they grow and change until they are ready to reproduce. This statement holds true for both plants and animals.  The Animal Kingdom contains an astonishing variety of life forms including sponges, jellyfish, snails, worms, insects, spiders, starfish, fish, snakes, frogs, birds and humans. Although there is tremendous variety within this kingdom, all life cycles result in offspring that resemble their parents. All mammals give birth to live young, while birds give birth to eggs that are then incubated to hatch live young. In general, frogs lay their eggs in water. The eggs then hatch into tadpoles which look like little fish with a tail and gills for breathing. As the tadpoles grow, they develop legs, their tail shortens, and their gills close as the lungs develop. The adult will then leave the water to live on land. Insect life cycles such as a butterfly start with an egg out of which hatches a larva (caterpillar) which consumes food to grow. The larva then transforms into a pupa (chrysalis) from which hatches the adult butterfly. | | |
| **INSTRUCTION** | | |
| 1. **Ask/Engage** | | |
| *How will you engage students? Introduce design challenge in general terms- what problem will students need to solve? Review any STEM Content that students will need to apply to solve design challenge.*  Show the students an egg. Ask students: *What am I holding? What animal do you think this from? What would happen if I drop this egg?*  Discuss the life cycle of a chicken. Have students fold a strip of paper in thirds. Draw a picture of each stage of the chicken’s life cycle (egg, baby chick, adult chicken). Use *Lifecycles: From Egg to Chicken* by Gerald Legg to show students images if needed.  Read aloud *Scrambled Egg Super* by Dr. Seuss. Ask students to give a thumbs down when they think an egg is in danger of breaking. | | |
| 1. **Imagine/Brainstorm** | | |
| *Introduce the constraints of the design plan. Define the criteria for success. Ask each student to work independently to come up with 1-2 possible design solutions. Students should draw/label their designs.*  Show students pg 22 (Long-Legger Kwonk) from *Scrambled Egg Super* by Dr. Seuss. Brainstorm ways to protect an egg that was dropped from a tall height.    Show students the straws, tape, scissors and egg. Explain that the students will construct a device to protect the egg as it is dropped form a height of about 15-20 feet. They will test their devices using the egg to see which devices best protect the egg.  Criteria:   1. You may only use the materials provided 2. Egg must not crack or be broken when dropped   Constraints:   1. Plastic bag containing the egg must not be attached to the device in any way   Give students 5 minutes to sketch a possible design for the device. | | |
| 1. **Plan/Design** | | |
| *Each student presents their ideas to their team. Student teams collaborate to come up with final design plan. Students draw final design plan and make a list of needed supplies.*  Students will share designs and come up with a group design for a device to protect the egg when dropped. | | |
| 1. **Create / Test** | | |
| *Student teams build their design according to their design plan. Students test their design plan and record data.*  Students will use the materials to construct a device to protect the egg when dropped from a given height.  Students will test their devices by dropping their devices from a ladder or other tall structure. | | |
| 1. **Evaluate/Improve –** and repeat Steps 1-5 | | |
| *Students evaluate their design for success. Did it meet the established criteria? Did their final design match their planned design? How would students improve their design?*  Students will reflect on the success or failure of their device in their journal. They will come up with ideas for improving their design. Students will then be given an opportunity to rebuild and retest their device. | | |

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Title of STEM Challenge

\_\_\_\_Grade

Description of STEM Challenge

**Challenge**:

**Criteria:**

1.

2.

3.

4.

**Constraints:**

1.

2.

3.

4.

**Materials:**

1. **ASK / ENGAGE:** What is the problem you are being asked to solve?

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1. **IMAGINE/BRAINSTORM:** What are some possible solutions to the problem that you are trying to solve? After you brainstorm, draw and label your ideas below.

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| **Idea #1** | **Idea #2** |

1. **PLAN/DESIGN:** Share your ideas with your group and collaborate to decide on a final design plan. Draw your team’s design below and make a list of the materials that you will need to complete your design.

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| **Team Design Plan** | **Materials List** |

1. **CREATE/TEST**: Use your Final Design Plan to create and build your solution. Test your design. Did it work? Why or Why not?

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1. **EVAULATE/IMPROVE:**  How well did your design work? Did your solution solve the problem within the given constraints?

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How can you improve your design? How can you make it better? Draw and label your improved design below.

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| **Improved Design Plan** |