DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

Best Care
OUT OF SCHOOL TIME

# STEM: EGG DROP WITH A TWIST

## NEXT GENERATION SCIENCE STANDARDS

The Next Generation Science Standards (NGSS) are a comprehensive guide for K – 12 STEM science content standards. The Framework lays out the STEM skills young people should have as they move through the K – 12 school system. This STEM Activity Lesson is designed to integrate the Next Generation Science Standards. For more information and to find all of the standards visit: https://www.nextgenscience.org/

### NGSS FOR THIS ACTIVITY LESSON

| Science and Engineering Practices | Disciplinary Core Ideas | Crosscutting Concepts |
|---|---|---|
| Developing and Using Models | ES S2.A: Earth's Materials and Systems | Stability and Change |
| Developing and Using Models | ES S1.A: The Universe and Its Stars | Patterns<br>Connections to Nature of Science |
| Developing and Using Models | ES S1.B: Earth and the Solar System | Patterns<br>Connections to Nature of Science |

*To see the full standard visit: https://www.nextgenscience.org/pe/ms-ess2-1-earths-systems and https://www.nextgenscience.org/pe/ms-ess2-1-earths-systems

## BIG IDEAS

### THE CLASSIC EGG DROP WITH A TWIST

- Egg drops are a traditional science, specifically physics and engineering, experiment. Usually, kids are given one egg, different materials, and are told to create something that will protect their egg when dropped from a designated point. Most egg drop projects require lots of loose materials, the children to design, tinker, and ultimately test their egg dropping mechanism. This challenge does not require as many materials but still allows the students to use their physics knowledge to test many packing materials for their egg drop.

## SUPPLIES & PREPARATION

## SUPPLIES

- Eggs
- Gallon plastic bags
- Water
- Ice
- Paper towels or napkins
- Dry cereal (preferably old, stale cereal)
- Flour
- Cups
- OPTIONAL: tape

## PREPARATION

- Six bags for each group
- Six eggs for each group (could be less if the egg survives a round)
- Pitchers of water or access to a sink
- Bags of ice or access to ice in a freezer
- Enough dry cereal to fill the six bags half way full
- Enough flour to fill the six bags half way full
- Paper towels to fill the six bags half way full
- Ice to fill the six bags half way full
- Plastic cup(s) for each group
- You can pre-fill all of the bags for the groups or you can allow them to fill their own bags

# ENGAGE THE STUDENTS

## OPTIONAL: EGG TOSS

1. To make it an egg-citing afterschool session, begin by paring off the students and playing a game of egg toss with them
2. Each set of partners gets ONE egg to use during the game
3. Begin with the partners standing approximately 1 foot apart, have them toss the egg to the other person
4. Next, have the partners move approximately 1 foot back for each round of the game, tossing the egg to the other person after moving each time
5. If partners drop their egg, they are out of the game
6. The last set of partners standing are the winning group!

## EGG DROP PREDICTIONS!

a. Have the students write out their predictions for each of the materials being used in the experiment
b. Lead the group in a discussion as to why they think certain materials will keep the egg safe and why they hypothesize that some eggs will break in certain materials

# EXPLORE & EXPERIMENT

## EXPERIMENT TIME!

1. Once the students are in groups, allow the students to fill the bags with the different packing materials (unless you have done that previous to the group arriving)
    a. You should allow the students to decide how to use the cups in the bag, I would give them 2 to work with
    b. Allow the students to place the egg in each bag of packing materials, this way they decide where in the material to put the egg and have more control over the experiment.
2. Decide on an order for the students to complete the egg drops in, if your students are older, you can allow them to decide what order
3. Begin with one of the egg drop materials, put an egg in the material (allow the students to decide where in the bag they want the egg to go, for instance on top of the material or in the middle (if it allows for placement)
4. Also allow the students to seal the bag the way they think is best; for instance, keep air in the bag or have all of the air taken out.
5. Before you drop the bags, have students write down their predictions for each bag
    a. Example: bag of ice – broken egg, bag of flour – egg not broken, etc.
6. Have all students drop their bags from the same spot; this can be as simple as off of a ladder, from the top floor down a stairwell, etc.
    a. It might be a good idea to lay down a tarp or trash bags where you are dropping the bags; the Ziploc bag should not burst, but the tarp is just in case
    b. Make sure you drop a bag with nothing but the egg in it first, this will serve as a control or base-line for the rest of the egg dropping
7. From this point on, drop each bag with an egg in it, discuss whether their prediction was correct or not and have them record (next to their prediction) what actually happened with the egg
8. After dropping all of the bags with different materials, have a discussion about which material worked best and what did not work at all

# CONNECT & EXTEND

- What was your favorite part about the egg drop experiment?
- What steps did you take to keep the egg from breaking? (sealing the bag with no air, burying the egg within the material, etc.)
- What problems came up while working with your group?
- What would you like to do differently the next time you complete this experiment?
- What new materials would be good to test with the egg drop?
- What advantage or disadvantage did the Ziploc bag provide the experiment?

## REFERENCES

Egg drop ideas for young kids: Classic STEM challenge. (2017). Little Bins for Little Hands. Retrieved on October 3, 2018, from https://littlebinsforlittlehands.com/egg-drop-activity-stem-challenge-young-kids/