Egg Drop STEM

LOW PREP
EASTER & SPRING
STEM CHALLENGE

K-5TH GRADE

CREATED BY BROOKE BROWN

- ✓ SIMPLE SUPPLIES
- ✓ INTERACTIVE ANCHOR CHARTS
- ✓ VISUAL VOCABULARY
- ✓ QR CODE RESEARCH
- ✓ REFLECTION QUESTIONS

Egg Drop

You need to deliver an egg from your balcony to your friend on the ground.

Construct a protective container that will keep your egg from breaking when it is dropped.

MATERIALS:

- Eggs (1-2 per group)
- Yardstick
- OPTIONS FOR CONTAINER: egg cartons, Styrofoam bowls/cups, construction paper, tissue paper, cotton balls, bubble wrap, plastic Easter basket "grass," tissues

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Egg Drop

REAL WORLD EXAMPLES

What is similar? What is different?

Types of Protective Materials

How Gravity Affects Falling Objects

EXPLORE GRAVITY

THE SHAPE OF EGGS

SCIENCE OF THE EGG DROP

VITY

FALLING OBJECTS

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WORDS TO KNOW

fragile
easily broken or damaged

impact
the action of one object coming forcibly into contact with another object

drag
force on an object in the air that reduces forward motion

gravity
force of attraction of objects to t

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THE ENGINEERING DESIGN PROCESS

ASK → IMAGINE → PLAN → CREATE → TEST & IMPROVE → REFLECT & PRESENT

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LET'S REFLECT!

- What was most difficult about this challenge?
- How did gravity affect your egg drop tests?
- How did drag affect your egg drop tests?
- Why are protective coverings and containers necessary for certain objects?
- What types of protective coverings are found in nature and on animals? (i.e. peanut shells, turtle shells)
- If you could design an indestructible egg carton, how would it be made?
- If we completed this challenge again, what would you do differently next time?

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DIFFERENTIATED RECORDING SHEETS FOR K-5TH GRADE

LOWER GRADES

Egg Drop Name: ______________

MY BLUEPRINT

Draw a picture of your egg container.

Draw your materials.

Did your egg break?

TEST 1	YES	NO
TEST 2	YES	NO

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UPPER GRADES

Egg Drop Name: ______________

BLUEPRINT

TEST	Did your egg break?	Height of Drop
1		
IMPROVEMENTS		
2		

Which materials best protected your egg?

How did your design protect your egg?

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DIGITAL GOOGLE SLIDES NOTEBOOK

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STEM Challenge Assessment Rubric

Challenge: ______________
Date: ______________
Student Name: ______________

3	2	1
Student followed all instructions for challenge.	Student followed some instructions for challenge.	Student did not follow instructions for challenge.
Student used best effort and perseverance on challenge.	Student used some effort and perseverance on challenge.	Student did not show effort or perseverance on challenge.
Student completed assigned blueprint and reflection sheet.	Student partially completed assigned blueprint and reflection sheet.	Student did not complete assigned blueprint and recording sheet.
Student showed accuracy in testing, calculating, and measuring.	Student showed some accuracy in testing, calculating, and measuring.	Student did not show accuracy in testing, calculating, or measuring.
Student fully cooperated with group members and contributed fairly.	Student partially cooperated with group members and contributed fairly.	Student struggled to cooperate with group members and/or failed to contribute.
Student fully participated in class discussions.	Student somewhat participated in class discussions.	Student did not participate in class discussions.

TOTAL POINTS: ______ /18

Comments: ______________

We Need STEM Supplies!

Dear Families,
We are learning all about Science, Technology, Engineering, and Math through STEM lessons, and we need your help! If you are able to donate any of the following supplies for our STEM Challenges, please detach and return the form below and send back to school with your child. We greatly appreciate your support and generosity!

We are in need of the following items by ______________

Thank you so much for helping to make our STEM lessons possible!
Please contact me at ______________ with any questions.

Sincerely,

If you are able to donate, please detach and return the form below:

Parent Name(s): ______________
Child's Name: ______________
I am able to donate: ______________

SAY *Hello* TO STRESS-FREE STEM!

SUPPLIES CHECKLIST

STEM CHALLENGE	ITEM	NUMBER PER GROUP	I HAVE IT
Egg Drop	eggs	2	
	yardstick	1	
	OPTIONS FOR EGG CONTAINER: egg cartons cut apart, Styrofoam bowls/cups, construction paper, tissue paper, cotton balls, plastic Easter basket "grass", bubble wrap, packing peanuts, tape	large variety	

STANDARDS ALIGNMENT

CHALLENGE	ENGINEERING	SCIENCE	MATH
Egg Drop	K-2-ETS1 Engineering Design: K-2-ETS1-1, 3-5 ETS1-2, 3-5 ETS1-3 3-5-ETS1 Engineering Design: 3-5-ETS1-1, 3-5 ETS1-2, 3-5 ETS1-3	K-PS2 Motion and Stability: Forces and interactions 3-PS2 Motion and Stability: Forces and Interactions 5-PS2 Motion and Stability: Forces and Interactions	MP1: Make sense of problems and persevere in solving them MP.2: Reason abstractly and quantitatively MP.4: Model with mathematics MP.5: Use appropriate tools strategically

SUPPLIES CHECKLIST & STANDARDS ALIGNMENT

CHALLENGE OVERVIEW

MATERIALS

STEP BY STEP INSTRUCTIONS

KEY SKILLS

SUGGESTED READ ALOUDS

STEM CHALLENGE: Egg Drop

OVERVIEW: This challenge allows your students to be innovative as they construct a protective egg container that will prevent an egg from breaking when it is dropped. They will need to consider forces of gravity and drag as it relates to the impact of the fall, as well as the height that their container is being dropped from. They should have a wide variety of materials to choose from for their design. For younger students, I would suggest that they drop their container from a standing position to minimize the impact. You may permit older students to stand on chairs or tables (always supervised properly) before dropping their containers.

KEY SKILLS: Engineering protective containers, Gravity, Drag, Structure of Eggs

SUGGESTED READ ALOUDS: The Easter Egg by Jan Brett, After the Fall by Dan Santat, Gravity by Jason Chin

MATERIALS PER GROUP: 2 eggs, yardstick
OPTIONS FOR EGG CONTAINER: egg cartons cut apart, Styrofoam bowls/cups, construction paper, tissue paper, cotton balls, plastic Easter basket (grass), bubble wrap, packing peanuts, tape

LESSON PLAN

1. Activate students' prior knowledge by asking them to share what they already know about gravity and how it affects falling objects. Discuss the different styles of materials that are used to pack and ship fragile objects in order to protect them from impact.
2. Share and discuss the videos on "Explore Gravity."
3. Hold a class discussion, using the teacher chart and real world examples to guide student thinking. (You can project the chart on an interactive whiteboard or document camera.) Record their ideas on the teacher chart.
4. Introduce the STEM challenge and permitted materials.
5. Introduce and discuss key vocabulary cards related to the challenge.
6. Have students sketch blueprints of their designs on their recording sheets.
7. Distribute materials and allow students 45-60 minutes to construct their egg drop containers and test them with drops from different heights, improving their protective design as needed. Older students may use a yardstick to measure the height of various drops.
8. Hold a whole class closing discussion and reflection, allowing students to share, compare, and contrast their egg container designs. Use the "Let's Reflect" poster to guide the discussion.