

STEM PATHWAYS

Eggstraordinary Eggs STEM Challenge!

The Problem

Sunny Side Eggs wants to reach a new market with a four pack to go egg carton. You have been contacted to work with a team to create and test a prototype.

The Challenge

Using the materials provided, your challenge is to design an egg carton prototype capable of protecting its contents from breakage under applied pressure.

Find a Solution

ASK: What are some possible ideas?

PLAN: Test out your ideas

CREATE: Put your ideas into action.

TEST: How well did your idea work?

IMPROVE: Review results & make changes.

Things to Consider

1. How will egg size affect the materials you choose?
2. How will design materials chosen impact shock absorption, support and separation to protect eggs from breaking?
3. What structural shape(s) do you predict will work the best? Why?

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Choose Your Design Materials

Large Sandwich Foam Container (1 per team)

Cotton Balls

Tooth Picks

Craft Sticks

Cotton Swabs

Cosmetic Sponges/Pads

3 oz. paper cups

Cardstock Strips

Toilet Paper

Paper Towels

Packing Peanuts

Straws

Masking tape

Bubble Wrap



SAFETY ALERT: Always wash hands with soap and water after handling eggs to prevent salmonella exposure!



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Egg Structure Exploration

- Lead youth in exploring the power packed in the structure of eggs before they design their egg carton prototypes.
- Give each youth an egg or if large group ask for a few volunteers. Have youth place egg in the palm of their hand and wrap their hand around the egg and squeeze. What happens?
- Have the youth hold the end's of the egg between their thumb and index finger and squeeze. What happens?
- Ask for a volunteer who would like to do the ultimate egg power test by standing on eggs. View the Eggstraordinary Power Challenge video for instruction.

TIME: 20-30 MINUTES

Materials and Supplies

- Large Sandwich Foam Container
- Cosmetic Sponges/Pads
- Cotton Balls
- Craft Sticks
- 3 oz. paper cups
- Toilet Paper
- Packing Peanuts
- Bubble Wrap
- Large Eggs
- Garbage Bags
- Tooth Picks
- Cotton Swabs
- Cardstock
- Paper Towels
- Straws
- Masking Tape
- Hand Sanitizer



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Design & Test Space

- Table Space for Each Team to Build Prototype
- Floor Space Covered with Garbage Bag for Teams to Test Prototype
- 2 Prototypes Must Be Tested at the Same Time with One Test Subject

Engage the Learner

1. What affect will the number of eggs placed in the egg carton have on the outcome?
2. How will egg orientation impact your design?
3. How would your design elements change if using different size or type of eggs?



Do you think our design worked?

Observations & Conclusions

1. How well did your egg carton protect the eggs inside?
2. What worked? What didn't? Knowing what you know, what changes will you make to your egg carton prototype?
3. If you could select any other materials to use, what would you choose and why?

Post who designed the most powerful egg carton. What features do you like about the design? What features would you change? (tamper resistance, cost effectiveness, etc.)

STEM Career Path... Packaging Engineer

Who else might be involved? *Food scientist, materials scientist, logistics specialist, industrial designer, marketer, etc.*

Who benefits? *Consumers: packaging that protects food from contamination, spoilage and/or breakage. Environment: use or recycled materials. Companies: reduction in product loss and waste.*

What other issues are Packaging Engineers helping to solve? *Tamper evident methods, re-use of product materials to reduce waste, robotics application, thermal & structure analysis.*

Refer to Career Focus Card for more details.



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