

4-H Hands-on Science

Inquiry Card You Crack Me Up!

Type of Inquiry:

Technological Problem Solving

Process Skills:

Observing, modelling, selecting, measuring, gathering data, recording, constructing, inventing, comparing, contrasting, evaluating and reflecting.



The Scenario:

An egg carton is a container designed for carrying and transporting whole eggs, while protecting them. Most of them are designed to carry 12 eggs and they are usually made of cardboard, styrofoam or plastic. Even though they are designed to protect the eggs, the consumer sometimes finds a broken egg in a carton.

Open-Ended Inquiry Questions:

- How can we improve on the design of the egg carton?
- What shape and material would best prevent the eggs from breaking?
- What carton shape would be best for allowing stacking during storing and shipping?

Instructions:

Young scientists should:

1. Collect a variety of current egg cartons available on the market.
2. Use the SCAMPER technique to brainstorm ideas on ways to improve their designs.
3. Choose the best ideas from the brainstorming session.
4. Develop prototypes based on these ideas.
5. Design a test that will mimic conditions during transportation of the eggs.
6. Test each prototype and collect data.
7. Fine-tune the prototype that gave the best results.

Scientific Principles:

When egg cartons collide with other objects during transportation, energy is transferred to the shell of the egg. The dome structure of the egg makes it very resistant to compression. To prevent breakage, the carton needs to be designed in a way to absorb energy instead of transferring it to the egg.



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