

Expert Engineer Assessment **Answer Key**

1. What types of materials worked best to cushion an egg so it doesn't crack? Why?

Complete answer: Materials like cotton balls, elastic fabric, rubber bands. The materials that are able to absorb energy.

2. What types of energy are involved in the dropping of an egg during the fall?

Complete answer: As the egg falls, its energy transfers from gravitational potential energy to kinetic energy.

Teacher note: In the activity just completed, expect students to come to understand that prior to the drop, an elevated egg has a large amount of gravitational potential energy due to its height above the ground. Expect students to be able to explain that when the egg is dropped, that energy is transferred from potential to kinetic. Right before the egg hits the egg catcher (which they designed), expect students to know that (nearly) all the potential energy has been converted to kinetic energy.

3. Where does the egg's kinetic energy go when the egg hits the egg catcher?

Complete answer: When the egg hits the ground, kinetic energy transfers to heat energy, sound energy, and/or the kinetic energy is absorbed by the egg catcher or by the egg (shell breaks).

4. How high did you drop an egg and keep it from breaking?

Answers will vary, depending on students' experiences. Example answer: "Our egg catcher caught an egg dropped from 150 cm with no cracking."

5. What was the most important part of your design? Why?

Answers will vary, depending on students' experiences. Example answer: "The most important part of our design was having catcher walls 6 cm tall because we noticed that the egg bounced when it hit the bubble wrap at the bottom of the catcher. If the egg had bounced out of the catcher, it would have broken."

6. BONUS: What step of the design process was your favorite? Explain why.

Answers will vary.