Role: You are an engineer at the US Green Building Council. You must promote sustainability practices.

Problem: You must argue that the egg drop challenge is unsustainable and impractical. The data would be better if the test object was more realistic and made from sustainable materials.

Products: 1. Various crash test dummies made from plaster (yeso blanco), 2. A summary arguing why crash dummies made from plaster are more sustainable based on carbon emissions, water footprint, or/and UN Sustainability goals.

Background information:
A crash test dummy, or simply dummy, is a full-scale anthropomorphic test device (ATD) that simulates the dimensions, weight proportions and articulation of the human body during a traffic collision. Dummies are used by researchers, automobile and aircraft manufacturers to predict the injuries a person might sustain in a crash. Modern dummies are usually instrumented to record data such as velocity of impact, crushing force, bending, folding, or torque of the body, and deceleration rates during a collision. Prior to the development of crash test dummies, automobile companies tested using human cadavers, animals and live volunteers. Cadavers have been used to modify different parts of a car, such as the seatbelt. This type of testing may provide more realistic test results than using a dummy, but it raises ethical dilemmas because human cadavers and animals are not able to consent to research studies. Animal testing is not prevalent today. Computational models of the human body are increasingly being used in industry and research to complement the use of dummies as virtual tools. Below are two live size parachute crash dummies from World War II.

Figure 1. Life size parachute crash dummies from WWII era. Notice the broken neck of the dummy on the right. Why would it be best to use objects that most resemble humans?
Not an Egg

Competent:
1. Create 3 crash test dummies of different sizes
2. Write an argument (in CER form) about why using plaster (yeso blanco) could be more sustainable than eggs as crash dummies.
   a. You can argue using evidence of carbon emissions, water footprint, or UN Sustainable goals.
   b. You must use numerical evidence from at least two scientific articles
   c. Must use in text citations and have a bibliography

Advanced:
3. Investigate how farmers in Colombia are producing eggs.
   a. What is the process for producing eggs?
   b. Where are most eggs produced in Colombia?
   c. Are they using or trying to improve sustainability techniques?
   d. Include citations

Mastery
4. Design a creative method to share and socialize your findings.
   a. How can we influence students, schools, and educators to use sustainable materials in classrooms?