

Crash Helmet Design

A Safety Product PBL for AEC Physics

In this authentic project, students will design, prototype and test a crash helmet with a purpose of protecting a population of people from traumatic head (brain) injury. Students will employ the design thinking process, start-to-finish, and use an egg to simulate a human head.



Create an action-oriented problem statement

Task: View the Define Phase (Part II) video on using Newton's Laws to inform your problem definition. Also view Professor Dave's three videos on Newton's Laws of motion, as well as the Newton Rap music video.

Work Product: Produce a Newton Egg Crash vlog. Create your vlog in Quicktime or a similar video recording platform. Record a clear, concise vlog summarizing how each of Newton's Laws of Motion relate to an egg dropping and crashing to the floor. Conclude with a statement about how you will use these concepts to help inform your problem definition and helmet design specifications. Your vlog should run approximately 90 seconds. Output your vlog in a standard video format (.mov, .mp4, etc.).

Scoring: The vlog should consist of:

- Intro: An introductory statement consisting of your first name and what your vlog is about (5 pts)
- Newton's First Law of Motion
 - State the law (5 pts)
 - State how the law relates to an egg dropping and crashing (5 pts)
- Newton's Second Law of Motion
 - State the law (5 pts)
 - State how the law relates to an egg dropping and crashing (5 pts)
- Newton's Third Law of Motion
 - State the law (5 pts)
 - State how the law relates to an egg dropping and crashing (5 pts)
- Informing your problem definition: State how you will use Newton's Laws to help define specifications for the egg crash protective device (5 pts)
- Vlog presentation: appropriate visual framing and lighting; clear audio; appropriate language and clarity; approximately 90 seconds in duration (10 pts)

Submit: Upload and share your vlog with your instructor via Google Drive or your YouTube channel and send the shared link via Edsby.