**CTE Helmet Design Group:**

**Background**

Helmet padding provides a protective barrier between the skull of the wearer and the contact surface, whether that is another helmet, the ground, or something else. Padding distributes the force of impact over a greater area, so the point of impact experiences less direct pressure. The padding deforms, absorbing some of the energy of the collision.

Helmet padding has changed over time as new materials have been discovered or developed. Helmets have different shapes and types of padding, depending on the intended use. In this experience, we will work with football helmets, which started as hard leather skullcaps and are now plastic shells lined with foam and air bladders.

**Objective**

You will design prototype helmet padding made from recycled materials. The padding must allow space for a theoretical head (at this time, we do not have a dummy head for sizing). You will make a true-to-scale blueprint of your helmet design with written instructions. A second team of students will construct the padding by following your blueprint and instructions. The final helmet will be fitted with an accelerometer and undergo impact testing.

**Requirements**

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| **2 Points** | **1 Point** | **0 Points** |
| Blueprint is true-to-scale | Blueprint has been scaled smaller | Blueprint has no clear scale |
| Blueprint is neat and legible | Blueprint is mostly neat and legible | Blueprint is sloppy and/or difficult to read |
| Blueprint includes clear written instructions | Blueprint includes some written instructions | Blueprint does not have written instructions |
| Blueprint has clear labels or a legend | Blueprint has some labels or a partial legend | Blueprint has few, if any, labels |
| Design uses only the materials provided |  | Design uses additional materials |
| Design allows room for a theoretical “head” | Design extends somewhat into helmet cavity | Design fills the entire helmet cavity |