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2014 CAWS Lesson Plan
"Foam density and recoverability"

Physical Science ALCOS 12

Overview: Students will measure density and perform compression and decompression recovery tests similar to the quality testing performed in a manufacturing setting. Students will graph and interpret their results, answering questions about foam samples based on their testing.

Objectives: Students will properly measure and express in correct units the mass, volume, and density of objects. Students will construct a graph of the results of the tests performed. Students will identify and analyze factors that may contribute to underperformance of objects.

Materials:

- Three separate foam samples
- Laboratory Balance
- Ruler/ Measuring Tape
- Pencil
- Graph Paper
- Five pound weights
- Stopwatch

Procedure: Instructor will divide class into cooperative groups. Students will determine the mass and volume of each foam sample. Students will then calculate the density of each sample. Students will then test the compression and recovery time of each sample. Each sample will be weighted with 5, 10, and 20 pounds of load respectively. Weight will be allowed to rest on foam for one minute. After one minute under load, students will remove weight and record the time necessary for foam to recover to original thickness. If after one minute, foam has not recovered to original thickness, the foam sample's thickness will be measured and compared to the original thickness. In this case, a percent error will be calculated. Students will then graph the recovery times for each sample and answer questions relating to density and weight load for each sample.

Assessment: Students will be evaluated on proper identification of scientific method components, proper construction of a hypothesis, accurate construction of a graph of their results of their weight load compression and decompression tests, and interpretation of variables that could affect foam quality and performance.

Accommodation: Students will feel foam and will describe its tangible qualities. Students will place a weight on the foam and describe what happens, as well as remove the weight and describe the foam's reaction to having the load removed.