

Workshop #3 Density determination using a Density Tower

Purpose

- Explore density and one way to determine the density of objects (Density tower). Determine density of random objects in the classroom;
- In regards to the Engineering Process this lesson is at the 'Do your research' and 'Develop a possible solution'.

Safety

- Glucose Syrup (no reference available)a
 - No PPE;
 - No handling instructions;
 - No First Aid.
- Glycerine (Reference Page 93 of Science ASSIST Chemical Management Handbook Edition 1 Feb-2017). Safe for F-12
 - PPE: Safety glasses, closed shoes, lab coat, gloves (nitrile, latex);
 - Handling Instructions:
 - Avoid ingestion and contact with skin, eyes and clothing.
 - First Aid in Reference.
- Water:
 - No PPE;
 - No handling instructions;
 - No First Aid.
- Vegetable Oil (no reference available):
 - No PPE;
 - No handling instructions;
 - No First Aid.
- Baby Oil (Reference MSDS)
 - No PPE;
 - Handling Instructions:
 - Limit all unnecessary personal contact.
 - Use in a well-ventilated area.
 - When handling DO NOT eat, drink or smoke.
 - First Aid in Reference.
- General Brief to students:
 - No fingers in mouth or face, need to wash hands afterwards;
 - No mucking around.

Materials

- Density Tower (From previous lesson);
- Safety/protection;
- Plastic of the following types:
 - 1 PET (Polyethyleneterephthalate) - soft drink and fruit juice bottles;
 - 2 HDPE (High-density polyethylene) - milk bottles or shampoo containers;
 - 3 PVC (Polyvinyl chloride or plasticised polyvinyl chloride) - cordial, juice or squeeze bottles;
 - 4 LDPE (Low density polyethylene) - garbage bags and bins;
 - 5 PP (Polypropylene) -ice cream containers, take-away food containers and lunch boxes; and
 - 6 PS (Polystyrene) - yoghurt containers, plastic cutlery, foam hot drink cups.
- Different objects that can be placed into the tube.
- Density handout for students to fill in.

Method to creating the density tower

1. Add different plastic types to the density tower. Some points to note about adding objects:
 - a. The surface tension may hold an object at a layer. So make sure to push it down a bit to make sure is at the correct surface. This can be done with kebab sticks.
 - b. Be careful to not mix the layers while adding the plastic.
2. Once the plastic has 'settled' to a layer have the students fill in the density handout;
3. Once students have completed the density handout they can place random objects from the classroom into the density towers.

Setup

- Tables outside.

Approach/Timing

Time	Duration (min)	Task	Description
1400	5	Introductions/Welcome	Students into groups and grab all the equipment.
1405	45	Add objects to density tower.r	
1450	5	Clean up / Pack Up	
1455	0	Back to Class / Finish	