**Experimental Design Division C**

**National Cathedral School Invitational 2017**

When plastics are recycled, it is particularly important that they are separated by type. The numbers on recyclable plastics help this process along, but on a large scale it is inefficient to hand sort the items. Instead, materials are separated by density.[[1]](#footnote-1)

Your task is to design and conduct an experiment that examines the density properties of pieces of recycled plastic from various sources.

**Materials Provided at Tables:**

Plastic pieces:

1: PETE (polyethylene terephthalate)

2: HDPE (high-density polyethylene)

3: V (polyvinyl chloride)

4: LDPE (low-density polyethylene)

5: PP (polypropylene)

6: PS (polystyrene)

Clear plastic cups

Rulers

**Materials at Distribution Center:**

Vegetable oil (D = 0.91 g/mL)

Distilled water (D = 1.0 g/mL)

Salt water (3.5 M NaCl, D = 1.1 g/mL

70% rubbing alcohol (2-propanol, D = 0.786 g/mL)

Dark Karo syrup (D = 1.37 g/mL)

Electronic balances (not to leave distribution center)

**Your report should contain all of the following sections. Make sure each section is clearly labeled.**

1. Statement of Problem (4 pts)
2. Hypothesis (8 pts)
3. Variables (20 pts):

Independent

Dependent

Controlled

1. Standard of Comparison/ Experimental Control (4 pts)
2. Materials and Procedures (18 pts)
3. Qualitative Observations (8 pts)
4. Quantitative Results: Data Table (12 pts)
5. Graph (10 pts)
6. Statistics (6 pts)
7. Analysis and Interpretations of Results (8 pts)
8. Possible Experimental Errors (6 pts)
9. Conclusion (8 pts)
10. Recommendations For Further Experimentation/Practical Applications (8 pts)

**Good luck!**

1. Adapted from Wikipedia and siena.edu [↑](#footnote-ref-1)