1. Suppose your dorm room is 11 ft wide by 12 ft long by 8.5 ft high and has an air conditioner that exchanges 1200L air/min. How long would it take the air conditioner to exchange the air in your room once?

2. Change 1µg/cm$^3$ to lb/in$^3$ using any metric to metric conversion you want. However, the only English to metric conversions you can use are that 1 lb = 453.6 g and 39.37 in = 1 meter.

3. According to the lore of ancient Greece, Archimedes discovered the displacement of method of density determination (the volume of water that a body displaces is the same as the volume of the body) while bathing and used it to find the composition of the king’s crown. If a crown weighting 4 lb 13 oz displaces 186 mL of water when placed in the bathtub, is the crown made of pure gold? (d$\text{gold}$=19.3 g/ml)

4. The corner convenience store sells only a few candy items. Gummy bears in 50 cents packages, 75 cents snicker bars and 1$ dove chocolate bars. List all the ways you can spend $3.5 in candy at the store.

5. Carleton’s wind turbine has been producing energy for just over a year. Carleton provides the following information on its wind turbine:

"The energy produced depends on the wind speed rather dramatically. At full power in a 27 mile per hour wind the generator will output energy at a rate of 1.65 million watts. This would operate 1650 toasters. In a 17 mile per hour wind the output power is about 0.7 million watts, which would operate 700 toasters. This amount of power is more in line with measured average wind speeds in this area. On a yearly basis, this turbine should produce about 5-6 million kilowatt hours of electricity needed for 500-600 homes."

About how many watts does it take to power one toaster? How many kilowatt hours does it take to service one home? (Courtesy of Trish Ferret, Chemistry Professor)

6. From “Quantitative Reasoning: Understanding the Mathematical Patterns in Nature” by F. Greenleaf. Section 1.3 Dealing with units, Exercise Set 1.3 (page 58-63)
   a. Exercise 33
   b. Exercise 32
   c. Exercise 43