

Problem Solving Challenges

For all problems, draw diagrams and/or clearly state any assumptions that you have made and where any information has come from. Present to the class!

1. McDonald's boasts that it has sold more than 50 billion burgers in the US. Approximately how many cows were slaughtered in order to meet this demand? How much feed stock would have been required?
2. Sodas are commonly sold in aluminium cans. Despite being easily recycled they are often thrown away. Estimate how many tonnes of aluminium are wasted every year in the US.
3. How many litres of water are in the school pool? Estimate how long it take to fill up from a standard hose pipe.
4. Two questions – a) one gallon of paint covers an area of 25.0 m^2 . What is the thickness of the paint film? b) It is possible to obtain a rough estimate for the diameter of an oil molecule by letting a single droplet spread over the surface of some water. The slick will be approximately one molecule thick. A scientist uses a droplet of mass $9.00 \times 10^{-7} \text{ kg}$ and density 918 kg/m^3 that spreads into a circle of radius 41.8 cm on the water. (recall that density = mass/volume)
5. At the moment the island's national debt is roughly \$2.5 billion.
 - a) How much does each Bermudian owe the creditors?
 - b) How high would this be if \$50 bills were stacked upwards?
 - c) If the bills were placed side by side and end to end, could they cover the island?
 - d) If the debt was paid off at a rate of \$1000/hr, with no interest, how many years would it take to clear the debt?
6. Donald Trump wants to build a wall between the US and Mexico to keep the so-called 'bad hombres' out. How much money would this cost? State any assumptions made!