

Physics 274 In-Class Worksheet
29 Sep 2011

Orders of Magnitude and Fermi Problems

Scientific notation is a way of writing very big or very small numbers in a succinct fashion, which gives us an intuitive feel for the size of the number.

Rules for scientific notation:

- Multiplication: $10^a \times 10^b = 10^{a+b}$
- Division: $\frac{10^a}{10^b} = 10^{a-b}$

1. How many gallons of gas are burned in Los Angeles each day?

2. Estimate the weight of coffee beans consumed in the United States each day.

3. How many grains of sand are there on the Santa Monica beach?

4. People are mostly made up of water. A water molecule weighs about 10^{-26} kg. Estimate how many water molecules there are in the average human body, which is 90% water.