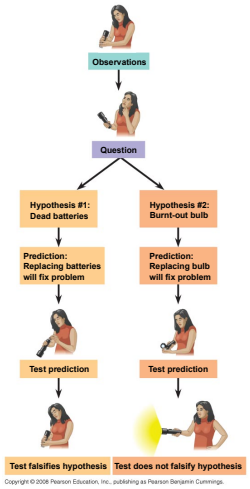
The Scientific Method

- Observations
- Questions
- Hypotheses
- Predictions
- Tests
- Outcomes



Fundamental Quantities

- Distance
- Time
- Mass
- Temperature
- Amount of substance

Metric Prefixes

- Giga- one billion (1,000,000,000 = 10^9) G
- Mega- one million (1,000,000 = 10^6) M
- Kilo- one thousand (1,000 = 10^3) k
- Hecto- one hundred (100 = 10^2) h
- Deca- ten (10 = 10^1) da
- (no prefix) one (1 = 10^0)
- Deci- one-tenth (0.1 = 10^{-1}) d
- Centi- one-hundredth (0.01 = 10^{-2}) c
- Milli- one-thousandth (0.001 = 10^{-3}) m
- Micro- one-millionth (0.000001 = 10^{-6}) μ
- Nano- one-billionth (0.000000001 = 10^{-9}) n

How many millimeters are in 150 miles?

Use dimensional analysis to find out.

These are conversion factors.

$$\left(\frac{150mi}{1}\right)\left(\frac{1760yd}{1mi}\right)\left(\frac{3ft}{1yd}\right)\left(\frac{12in}{1ft}\right)\left(\frac{2.54cm}{1in}\right)\left(\frac{1m}{100cm}\right)\left(\frac{1000mm}{1m}\right) = 241{,}401{,}600mm$$

This is given in the problem.

All units cancel except the ones that should be in the answer.

To three significant figures, the answer is 241 million millimeters, or 2.41 x 10^8 mm.

Metric System Nations