

Mole Day 2026 Practice Sheet

Friday, Oct. 23, 2026 · celebrate from 6:02 a.m. to 6:02 p.m.

$$N_A = 6.022\,140\,76 \times 10^{23} \text{ mol}^{-1}$$

The Avogadro constant, exact since the 2019 revision of the International System of Units (SI).

1 mole

contains exactly $6.022\,140\,76 \times 10^{23}$ entities: atoms, molecules, ions or electrons.

Atomic weights (IUPAC): H 1.008 · He 4.0026 · C 12.011 · O 15.999 · Na 22.990 · Cl 35.45

1. How many water molecules (H_2O) are in 18.015 grams of water?

2. How many moles are in 44.009 grams of carbon dioxide (CO_2)?

3. How many atoms are in 2 moles of helium?

4. What is the mass of 0.5 mole of sodium chloride (NaCl)?

Answer key (fold under): 1. 1 mole = 6.022×10^{23} molecules (molar mass of water $2 \times 1.008 + 15.999 = 18.015 \text{ g/mol}$). 2. 1.000 mole ($12.011 + 2 \times 15.999 = 44.009 \text{ g/mol}$). 3. $2 \times 6.022 \times 10^{23} = 1.204 \times 10^{24}$ atoms. 4. $0.5 \times (22.990 + 35.45) = 0.5 \times 58.44 = 29.22 \text{ g}$.

Sources: International Bureau of Weights and Measures (BIPM), SI base unit mole; NIST CODATA; IUPAC Commission on Isotopic Abundances and Atomic Weights; National Mole Day Foundation.