1. How many moles of magnesium (Mg) are there in 87.3 g of Mg?

2. Zinc (Zn) is a silvery metal that is used in making brass (with copper) and in plating iron to prevent corrosion. How many grams of Zn are in 0.356 mol of Zn?

3. Sulfur (S) is a nonmetallic element that is present in coal. When coal is burned, sulfur is converted to sulfur dioxide and eventually to sulfuric acid that gives rise to the acid rain phenomenon. How many atoms are in 16.3 g of S?

4. Calculate the number of grams of lead (Pb) in 12.4 moles of lead.

5. Calculate the number of atoms in 0.551 g of potassium (K).

6. Earth’s population is about 6.9 billion. Suppose that every person on Earth participates in a process of counting identical particles at the rate of two particles per second. How many years would it take to count $6.0 \times 10^{23}$ particles? Assume that there are 365 days in a year.
7. Calculate the number of moles of chloroform (CHCl₃) in 198 g of chloroform?

8. How many H atoms are in 72.5 g of isopropanol (rubbing alcohol), C₃H₈O?

9. A modern penny weighs 2.5 g but contains only 0.063 g of copper (Cu). How many copper atoms are present in a modern penny?

10. Which of the following has a greater mass: 2 atoms of lead, or 5.1×10⁻²³ mole of helium.

11. The thickness of a piece of paper is 0.0036in. Suppose a certain book has an Avogadro’s number of pages; calculate the thickness of the book in light-years. (hint: see problem 1.49 in your book for the definition of a light-year)

12. Which of the following contains the largest number of atoms:
   a. 7.68 g of He
   b. 112 g of Fe
   c. 389 g of Hg