

11 b ? hides = 23 nook $\times \frac{1 \text{ yd}}{4 \text{ nook}} \times \frac{1 \text{ hid}}{4 \text{ yd}} = 1.44 \text{ Hides}$

Review 1 & 2

? f = 23 nook $\times \frac{2 \text{ f}}{1 \text{ nook}} = 4.6 \times 10^1 \text{ Fardells}$

1. How many significant figures are there in each of the following?

- a. 26.2 cm **3**
- b. 0.00014 g **2**
- c. 14.0 cm³ **3**
- d. 2.04 g **3**

2. Calculate each of the following to the correct number of significant figures:

- a. $x = 12.2 \text{ g} / 50.3 \text{ cm}^3$ **1.243 g/cm³**
- b. $x = (6.54 \text{ g} + 1.12 \text{ g}) / 3.91 \text{ cm}^3$ **1.96 g/cm³**
- c. $x = 16.0 \text{ g} + 125 \text{ g}$ **141 g**
- d. $x = (6.19 \text{ cm}) (2.4 \text{ cm})$ **15 cm²**

3. When filled with helium, the Goodyear blimp Columbia is 51 ft wide, 192 ft long and 59 ft high. Assuming its volume is the product: width x length x height, express the volume in:

- a. cubic feet **$5.78 \times 10^5 \text{ ft}^3$**
- b. liters **? L = $5.78 \times 10^5 \text{ ft}^3 \times \frac{123 \text{ in}^3}{1 \text{ ft}^3} \times \frac{2.54^3 \text{ cm}^3}{1 \text{ in}^3} \times \frac{1 \text{ L}}{1000 \text{ cm}^3} = 1.64 \times 10^7 \text{ L}$**

4. A man is 5 ft 10 in tall and 132 lb. Express these measurements in meters and kilograms.

1.78 m **? kg = $132 \text{ lb} \times \frac{1 \text{ kg}}{2.2 \text{ lb}} = 6.0 \times 10^1 \text{ kg}$**

5. A world class sprinter runs the 100 yd dash in 9.1 s. What is his speed in miles per hour?

$2.25 \times 10^1 \text{ mi/hr}$

6. A gold atom has a diameter of 0.288 nm, (1 nm = 10⁻⁹ m). How many miles long would a row of 6.02 x 10²³ gold atoms be?

? mi = $6.02 \times 10^{23} \times 0.288 \text{ nm} \times \frac{10^{-9} \text{ m}}{1 \text{ nm}} \times \frac{1000 \text{ cm}}{1 \text{ m}} \times \frac{1 \text{ in}}{2.54 \text{ cm}} \times \frac{1 \text{ yd}}{36 \text{ in}} \times \frac{1 \text{ mi}}{1760 \text{ yd}} = 1.08 \text{ mi}$

7. The density of air at 20° C and 1 atm is 1.2 g/L. How many kilograms of air are there in a balloon with a volume of one cubic meter under these conditions?

1.2 kg

8. The following data refer to the element oxygen. Classify each as a physical or chemical property:

- a. forms a compound with iron **C**
- b. boils at 90 K at 1 atm **P**
- c. slightly soluble in water **P**
- d. reacts with carbon to form carbon dioxide **C**

9. A water bed filled with water has the dimensions 8 ft x 6.5 ft x 0.75 ft. How many kilograms of water are needed to fill the bed?

1.2 kg

10. Blood plasma volume for adults is about 3.1 L. Its density is 1.027 g/cm³. About how many pounds of blood plasma are there in your body?

? lb = $3.1 \text{ L} \times 1.027 \text{ g/cm}^3 \times \frac{1000 \text{ cm}^3}{1 \text{ L}} \times \frac{1 \text{ kg}}{1000 \text{ g}} \times \frac{2.2 \text{ lb}}{1 \text{ kg}} = 7.00 \text{ lb}$

11. During earlier times in England, land was measured in units such as fardells, nooks, yards and hides: 2 fardells = 1 nooke; 4 nookes = 1 yard; 4 yards = 1 hide. Calculate:

? f = $4 \text{ hide} \times \frac{1 \text{ yd}}{4 \text{ nook}} \times \frac{4 \text{ nook}}{1 \text{ yd}} \times \frac{2 \text{ f}}{1 \text{ nook}} = 1.28 \times 10^2 \text{ fardells}$

- a. 4.00 hides = fardells
- b. 23 nookes = hides; = fardells

12. Oil spreads on water to form a film about 100 nm thick. How many square kilometers of ocean will be covered by the slick formed when one barrel of oil is spilled? (1 barrel = 31.5 gal)

? km² =

9. ? kg = $8 \text{ ft} \times 6.5 \text{ ft} \times 0.75 \text{ ft} \times \frac{1.2 \text{ g}}{1 \text{ cm}^3} \times \frac{1 \text{ kg}}{1000 \text{ g}} = 1.10 \times 10^3 \text{ kg}$

$1.2 \text{ g/cm}^3 \times \frac{1 \text{ in}^3}{2.54^3 \text{ cm}^3} \times \frac{1 \text{ yd}^3}{36^3 \text{ in}^3} \times \frac{1 \text{ mi}^3}{1760^3 \text{ yd}^3} = 1.08 \text{ mi}^3$