

- ★ 1. You are going to fertilize a field. You put down 32 kilograms per acre. You have 8000 acres of land you want to fertilize at this rate. How many us tons do you put down per acre? How many tons do you use total? 1 kg/2.2 lbs and 1 ton = 2000 lbs.
- ★ 2. You are going to fertilize a field. You put down 8 gallons per acre. You have 50 acres of land you want to fertilize at this rate. How many us ounces do you put down per acre? How many cups do you use total? 128 oz/ 1 gal and 16 cups/ 1 gal
- ★ 3. You are going to fertilize a field. You put down 72 kilograms per acre. You have 2000 acres of land you want to fertilize at this rate. How many us tons do you put down per acre? How many tons do you use total? 1 kg/2.2 lbs and 1 ton = 2000 lbs.
- ★ 4. You are going to fertilize a field. You put down 7 gallons per acre. You have 150 acres of land you want to fertilize at this rate. How many us ounces do you put down per acre? How many cups do you use total? 128 oz/ 1 gal and 16 cups/ 1 gal
5. You are helping a family from Europe. A label says to mix 28 ounces of chemical per gallon of water. How many milliliters of chemical is this per liter of water? 1 fluid ounce/29.57 mL, 1000 milliliter = 1 liters, 128 ounces per gallon.
6. You are helping a family from Europe. A label says to mix 2 ounces of chemical per gallon of water. How many milliliters of chemical is this per liter of water? 1 fluid ounce/29.57 mL, 1000 milliliter = 1 liters, 128 ounces per gallon.
- ★ 7. You need to figure out number pounds per acre your fields need to yield to get enough hay for the winter. You know you need 4000 bales for a winter that weigh 0.5 tons each. You have 1000 acres. What is your yield in pound per acre to get your goal? What is your yield in bales per acre to hit this goal? 1 ton = 2000 lbs
- ★ 8. You have a plastic bin filled with seed. The bottom of the bin is 3 ft by 2 ft. The bin filled weighs 60 pounds. How many pounds per square inch (psi) are exerted on the table it sits on? Given that 144 in squared in one foot squared.

For number 9 – 12 please use the following table. Note that the base units (the one in the picture) for these problems are Volts, ohms, and amps. Any time you see centi, kilo, hector, deci, etc you must convert.

Prefixes

- Kilo - 1000
- Hecto - 100
- Deca - 10
- 1
- Deci - 0.1
- Centi - 0.01
- Milli - 0.001

- k
- h
- da
-
- d
- c
- m

.001 KL
 .01 HL
 10 DL
 1 L
 10 dL
 100 cL
 = 1000 mL

★
 0.5 tons
 1 bale

6 ft²

~~1~~ x ~~tons~~ = ~~tons~~
 1
 = 1000

9. You are trying to figure out how many amps are running through a system. You are given the following formula: Volts (V) divided by resistance (ohms) equals current (amps). If you have 7 mV power source and resistor with 240 ohms, what is your current in amps? 1 volt equals 1000 millivolts (mV).

10. You are trying to figure out how many amps are running through a system. You are given the following formula: Volts (V) divided by resistance (ohms) equals current (amps). If you have 7 mV power source and resistor with 20000 centiohms, what is your current in amps?

11. You are trying to figure out how many volts your power source is. You are given the following formula: Resistance (ohms) multiplied by current (amps) equals volts (V). If you measure a current of 5 amps and resistor with 100000 centiohms, what is your source voltage in volts?

12. You are trying to figure out how many volts your power source is. You are given the following formula: Resistance (ohms) multiplied by current (amps) equals volts (V). If you measure a current of 60 milliamps and resistor with 468 ohms, what is your source voltage in volts?

13. A mixer wagon can hold 6 tons. You are blending a few feeds. One is liquid. Got some potato waste. You want to put in a 0.5 tons of potato waste. You know the density of the potato waste is 62.9 pounds/cubic ft. You also know there is 1 ton in 2000 pounds. You also know there is 7.48 gallons in one cubic foot. How many gallons of potato waste do you put in the wagon to hit your goal?

14. A mixer wagon can hold 6 tons. You are blending a few feeds. One is liquid. Got some potato waste. You want to put in a 0.1 tons of potato waste. You know the density of the potato waste is 62.9 pounds/cubic ft. You also know there is 1 ton in 2000 pounds. You also know there is 7.48 gallons in one cubic foot. How many gallons of potato waste do you put in the wagon to hit your goal?

15. Jake is paid per acre of manure spread. Jake keeps bad records. He tried to figure out how many acres he has spread one day. He timed himself and averaged acres over these hours. He found he did 40 acres per hour. He worked for Pete for 26 hours. He is paid \$2 American dollars per acre per Pete. Jake is Canadian. How many Canadian dollars did Jake make? You know that 1 Canadian dollar equals 1.25 American dollars.

16. You are converting more metric units. The bottle of antibiotic says you inject 30 milliliters per 600 kg of animal. How many ounces do you inject per pound of animal? 1 fluid ounce = 29.6 milliliters. One kilogram equals 2.2 pounds.

17. You are converting more metric units. The bottle of antibiotic says you inject ~~30~~ ⁹⁰ milliliters per ~~600~~ kg of animal. How many ounces do you inject per pound of animal? 1 fluid ounce = 29.6 milliliters. One kilogram equals 2.2 pounds.

18. How many US sections is a farm that is 900 hectares? You know 1 section = 640 acres. You know that 1 hectare = 2.47 acres.

1. A $\frac{1 \text{ ton}}{2000 \text{ lbs}} \times \frac{2.2 \text{ lbs}}{1 \text{ kg}} \times \frac{32 \text{ kg}}{1 \text{ acre}} = \frac{\text{tons}}{1 \text{ acre}} = \frac{0.0352 \text{ tons}}{1 \text{ acre}}$

B $\frac{0.0352 \text{ tons}}{1 \text{ acre}} \times \frac{8000 \text{ acres}}{1} = \frac{281.6 \text{ tons}}{1}$

2. A. $\frac{8 \text{ gal}}{1 \text{ acre}} \times \frac{128 \text{ oz}}{1 \text{ gal}} = \frac{\text{oz}}{1 \text{ acre}} = \frac{1024 \text{ oz}}{1 \text{ acre}}$

B $\frac{50 \text{ acres}}{1} \times \frac{8 \text{ gal}}{1 \text{ acre}} \times \frac{16 \text{ cups}}{1 \text{ gal}} = \frac{6400 \text{ cups}}{1}$

3. A. $\frac{1 \text{ ton}}{2000 \text{ lbs}} \times \frac{2.2 \text{ lbs}}{1 \text{ kg}} \times \frac{72 \text{ kg}}{1 \text{ acre}} = \frac{\text{tons}}{1 \text{ acre}} = \frac{0.0792 \text{ tons}}{1 \text{ acre}}$

B. $\frac{0.0792 \text{ tons}}{1 \text{ acre}} \times \frac{2000 \text{ acres}}{1} = \frac{158.4 \text{ tons}}{1}$

4. A. $\frac{7 \text{ gal}}{1 \text{ acre}} \times \frac{128 \text{ oz}}{1 \text{ gal}} = \frac{896 \text{ oz}}{1 \text{ acre}}$

B. $\frac{7 \text{ gal}}{1 \text{ acre}} \times \frac{16 \text{ cups}}{1 \text{ gal}} \times \frac{150 \text{ acres}}{1} = 16800 \text{ cups}$

Option 2

5. $\frac{28 \text{ oz chem}}{1 \text{ gallon water}} \times \frac{29.57 \text{ mL chem}}{1 \text{ oz chem}} \times \frac{1 \text{ gal water}}{128 \text{ oz w}} \times \frac{1 \text{ oz water}}{29.57 \text{ mL water}} \times \frac{1000 \text{ mL}}{1 \text{ L water}}$

$\frac{218.23 \text{ mL chem}}{1 \text{ L water}}$

or break up - recommend

In dolls $\frac{28 \text{ oz chem}}{1} \times \frac{29.57 \text{ mL}}{1 \text{ oz}} = \frac{827.96 \text{ mL chem}}{1} = \frac{\text{mL chem}}{1}$

$\frac{1 \text{ gal H}_2\text{O}}{1} \times \frac{128 \text{ oz}}{1 \text{ gal}} \times \frac{29.57 \text{ mL}}{1 \text{ fl oz}} \times \frac{1 \text{ L}}{1000 \text{ mL}} = \frac{1 \text{ litre of H}_2\text{O}}{1} = \frac{3.78496 \text{ L H}_2\text{O}}{1}$

then we put together

$\frac{827.96 \text{ mL chem}}{3.78496 \text{ L H}_2\text{O}} = \frac{218.75 \text{ mL}}{1 \text{ liter}}$

$$5. \frac{2 \text{ oz chem}}{1} \times \frac{29.57 \text{ mL chem}}{1 \text{ fl oz chem}} = \frac{\text{mL chem}}{1} = \frac{59.14 \text{ mL chem}}{1}$$

$$\frac{1 \text{ gal H}_2\text{O}}{1} \times \frac{128 \text{ oz}}{1 \text{ gal H}_2\text{O}} \times \frac{29.57 \text{ mL}}{1 \text{ oz}} \times \frac{1 \text{ L H}_2\text{O}}{1000 \text{ mL H}_2\text{O}} = \frac{\text{L H}_2\text{O}}{1} = \frac{3.78496 \text{ L}}{1}$$

so

$$\frac{59.14 \text{ mL chem}}{3.78496 \text{ L H}_2\text{O}} = \boxed{\frac{15.625 \text{ mL chem}}{1 \text{ L H}_2\text{O}}}$$

$$7. \frac{4000 \text{ bales}}{1} \times \frac{0.5 \text{ ton}}{1 \text{ bale}} \times \frac{2000 \text{ lbs}}{1 \text{ ton}} \times \frac{1}{1000 \text{ acres}} = \frac{\text{lbs}}{1 \text{ acre}} = \frac{4000 \text{ lbs}}{1 \text{ acre}}$$

$$\frac{1}{1000 \text{ acres}} \times \frac{4000 \text{ bales}}{1} = \frac{\text{bales}}{1 \text{ acre}} = \boxed{\frac{4 \text{ bales}}{1 \text{ acre}}}$$

8. First $3 \text{ ft} \times 2 \text{ ft} = 6 \text{ ft}^2$

$$\frac{60 \text{ lbs}}{1} \times \frac{1}{6 \text{ ft}^2} \times \frac{1 \text{ ft}^2}{144 \text{ in}^2} = \frac{\text{lbs}}{\text{in}^2} = \boxed{\frac{0.0694 \text{ lbs}}{\text{in}^2}}$$

9.

$$\frac{V}{r} = \text{Amps}$$

 $\Omega = \text{ohms}$

$$\frac{7\text{mV}}{1} \times \frac{1\text{V}}{1000\text{mV}} = \frac{V}{1} = 0.007\text{V}$$

so

$$\frac{.007\text{V}}{240\Omega} \approx$$

$$\boxed{.000029167 \text{ amps}}$$

10. $\frac{V}{\Omega} = \text{Amps}$

$$\frac{7\text{mV}}{1} \times \frac{1\text{V}}{1000\text{mV}} = \frac{V}{1} = .007\text{V}$$

$$\text{so } \frac{.007}{200} =$$

$$\frac{20000\text{e}\Omega}{1} \times \frac{1\Omega}{100\text{cent}\Omega} = 200\Omega$$

$$\boxed{.000035 \text{ Amps}}$$

ohms amp volts
 \downarrow \downarrow \downarrow
 11. $R \times I = V$ ←
 $\Omega \times A = V$ so $100000 \text{ c}\Omega \times 5A =$ convert to Ω

$$\frac{100000 \text{ c}\Omega}{1} \times \frac{1\Omega}{100 \text{ c}\Omega} = \boxed{\frac{1000\Omega}{1} = \Omega}$$

$$\frac{1000\Omega}{1} \times \frac{5A}{1} = \boxed{\frac{5000V}{1}}$$

12. Like 11 but convert Amps to milliamps

$$\frac{60 \text{ mA}}{1} \times \frac{1A}{1000 \text{ mA}} = \boxed{.06A}$$

$$\boxed{468\Omega \times 0.06A = 28.08V}$$

$$13. \frac{0.5 \text{ tons}}{1} \times \frac{2000 \text{ lbs}}{1 \text{ ton}} \times \frac{1 \text{ ft}^3}{62.9 \text{ lbs}} \times \frac{7.48 \text{ gal}}{1 \text{ ft}^3} = \frac{119.92 \text{ gal}}{1} = \frac{\text{gal}}{1}$$

14. same as 13 but 0.1 tons
or

$$\frac{0.1 \text{ tons}}{1} \times \frac{2000 \text{ lbs}}{1 \text{ ton}} = \frac{200 \text{ lbs}}{1} \times \frac{1 \text{ ft}^3}{62.9 \text{ lbs}} \times \frac{7.48 \text{ gal}}{1 \text{ ft}^3} = \boxed{\frac{23.78 \text{ gal}}{1}}$$

$$15. \frac{26 \text{ hrs}}{1} \times \frac{40 \text{ acres}}{1 \text{ hr}} \times \frac{\$2}{1 \text{ acre}} \times \frac{1 \text{ \$C}}{1.25 \text{ \$}} = \frac{\text{\$C}}{1}$$

1664 Canadian \$

$$16. \& 17 \quad \frac{30 \text{ mL}}{600 \text{ Kg}} \times \frac{1 \text{ Kg}}{2.2 \text{ lbs}} \times \frac{1 \text{ Floz}}{29.6 \text{ mL}} \quad \approx \frac{0.2}{16}$$

$$\frac{.00076 \text{ oz}}{16}$$

$$18. \quad \frac{900 \text{ ha}}{1} \times \frac{2.47 \text{ ac}}{1 \text{ hectare}} \times \frac{1 \text{ sec}}{640 \text{ a}} = \frac{\text{sections}}{1}$$

$$\sim 3.47 \text{ sections}$$