

Year 11 Conversion Questions #1

1. 1 litre = 0.2642 (US) gallons. What is 24 litres in gallons?
2. 1 mile = 1.61 kilometres. Give 200 km in miles.
3. 1 fathom = 1.829 metres. If a diver is 16 fathoms down, what is that in metres?
4. 1 knot = 1.852 km per hour. What is a boat speed of 50 knots in kph?
5. 1 acre = 0.4047 hectares. What is a farm of 64 acres into hectares.
6. 1 troy ounce = 31.1 grams. Convert 45 grams of gold to troy ounces.
7. 0.4536 kilogram is 1 pounds . How heavy in kg is a 260 pound basketball player?
8. 1 kJ = 239.01 calories. What is a recommended daily intake of 2400 calories in kJ?
9. There are 0.7457 kilowatts in 1 horsepower. What is a 280 horsepower engine in kW.
10. Typically concrete weighs 2,400 kg per m^3 . A tonne is 1000 kg. How many m^3 of concrete would it take to weigh 5 tonnes ?
11. A g-unit is the acceleration due to gravity on the earth at sea level, and is 9.81 m s^{-2} . If the moon's surface gravity is 0.1654 g, how many m s^{-2} is it?
12. There are 10 decilitres in a litre. How many deciliters is a 750 millilitre bottle of wine?
13. 1 bar = 14.50 psi (Pound Per Square Inch). What is an atmospheric pressure of 14.8 psi in millibars?
14. 1 lux = $1.4641 \times 10^{-7} \text{ W cm}^{-2}$ (watt per square centimeter). Convert 5.46×10^8 lux of light intensity from a lamp to W cm^{-2} .
15. 6.5 miles to the gallon (US) is the same as 2.76 km per litre. What would 7.2 miles per gallon convert to?
16. 350 US Dollar was equal to 307.44 Euros on 22 February 2015. What would € 500 be worth in US\$ at that time?

Answers Year 11 Conversion Questions #1

The exact methods used can differ, so the following are only suggested calculations

1. Need less in gallons $\Rightarrow 24 \text{ L} = 24 \times 0.2642 = \mathbf{6.3408 \text{ gallons}}$.
2. Need less in miles $\Rightarrow 200 \text{ km} = 200 \div 1.61 = \mathbf{124.2 \text{ miles}}$.
3. Need more in metres $\Rightarrow 16 \text{ fathoms} = 16 \times 1.829 = \mathbf{29.264 \text{ metres}}$.
4. Need bigger number in kph $\Rightarrow 50 \text{ knot} = 50 \times 1.852 = \mathbf{92.6 \text{ km per hour}}$.
5. Need fewer hectares $\Rightarrow 64 \text{ acres} = 64 \times 0.4047 = \mathbf{25.9 \text{ hectares}}$.
6. Troy ounce is smaller number $\Rightarrow 45 \text{ g} = 45 \div 31.1 = \mathbf{1.447 \text{ troy ounces}}$.
7. Need smaller number of kg $\Rightarrow 260 \times 0.4536 = \mathbf{117.9 \text{ kg}}$.
8. Need less kJ $\Rightarrow 2400 \div 239.01 = \mathbf{10.04 \text{ kJ}}$.
9. Need smaller number for kW $\Rightarrow 280 \times 0.7457 = \mathbf{208.2 \text{ kW}}$.
10. $2,400 \div 1000 = 2.4 \text{ tonnes per } 1 \text{ m}^3$. Need less m^3 than tonnes $\Rightarrow 5 \div 2.4 = \mathbf{2.083 \text{ m}^3}$.
11. The moon has a smaller g, so need less m s^{-2} $\Rightarrow 9.81 \times 0.1654 = \mathbf{1.62 \text{ m s}^{-2}}$.
12. $750 \div 1000 = 0.75 \text{ L bottle}$. There are more dL than L $\Rightarrow 0.75 \times 10 = \mathbf{7.5 \text{ dL}}$.
13. Need less bars than psi $\Rightarrow 14.8 \div 14.50 = 1.02068 \text{ bars} = \mathbf{1021 \text{ millibars}}$.
14. 10^{-7} is a very small number, so we need a much smaller number of W cm^{-2} than lux.
 $5.46 \times 10^8 \times 1.4641 \times 10^{-7} = \mathbf{79.94 \text{ W cm}^{-2}}$
15. $6.5 \text{ mpg} = 2.76 \text{ kpl}$. Dividing both sides by 6.5 we get: $1 \text{ mpg} = 0.4246 \text{ kpl}$.
Need a smaller number of kpl $\Rightarrow 7.2 \times 0.4246 = \mathbf{3.056 \text{ km per L}}$
16. $350 \text{ USD} = 307.44 \text{ EUR}$. Dividing both sides by 350: $1 \text{ USD} = 0.8784$
Need more USD than EUR $\Rightarrow \text{€ } 500 \div 0.8784 = \mathbf{569.17 \text{ US\$}}$.