Scientific Notation

1. Calculate (**Give your answers in Scientific Notation**)

(a) $(2.5 \times 10^5) \times (3 \times 10^4)$

(b) $(2.2 \times 10^6) \times (4 \times 10^{-2})$

(c) $(1.65 \times 10^{-4}) \times (7 \times 10^7)$

(d) $(4.6 \times 10^4)^2$

(e) $(5.6 \times 10^{-2}) \times 42\,000$

(f) $34\,000\,000 \times (2.25 \times 10^4)$

(g) $(7.8 \times 10^7) \div (3 \times 10^3)$

(h) $(6.16 \times 10^5) \div (4 \times 10^3)$

(i) $(4.23 \times 10^6) \div (7.5 \times 10^{-3})$

(j) $(9.22 \times 10^8) \div 55\,000$

(k) $42\,000\,000 \div (6.3 \times 10^4)$

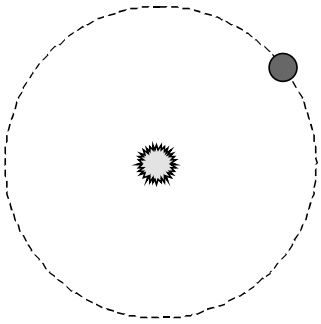
(l) 7.5 million $\div (2.2 \times 10^4)$

2. A test tube contains 3×10^4 cubic millimetres of water. If each cubic millimetre of water contains 1.75×10^3 bacteria, how many bacteria are in the test tube?
Give your answer in Scientific Notation.

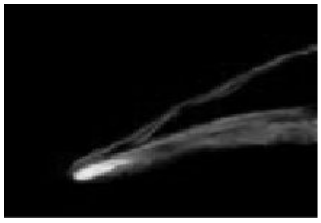
3. A biologist is carrying out a study into coral on the Great Barrier Reef of Australia. He estimates 1 cubic metre of coral contains 5.66×10^5 individuals animals.
How many individual animals would there be in 10 000 cubic metres of coral?
Give your answer in Scientific Notation.

4. A new airport terminal has been open for 200 days. In total 2.66×10^7 passengers have passed through the terminal.
Calculate the average number of passengers passing through the terminal each day.
Give your answer in Scientific Notation.

5. In one orbit of the Sun the planet Mercury travels approximately 3.48×10^8 kilometres. This orbit takes 88 days.
Calculate the speed of Mercury, in kilometres per **hour,** as it travels round the Sun.
Give your answer in Scientific Notation.



6. A comet travels a distance of 5.33×10^8 kilometres in one year.
Calculate the speed of the comet in kilometres per hour.
Give your answer in Scientific Notation.



7. A space telescope discovers a new galaxy, a distance of 125 million light years from Earth.
One light year is approximately 9.46×10^{12} kilometres.

Calculate the distance of the galaxy from Earth in kilometres.
Give your answer in Scientific Notation.

8. There are 6.02×10^{23} particles in one mole of carbon.
   How many particles are there in 700 moles of carbon. **Give your answer in Scientific Notation.**

9. A stagnant fish pond is estimated to contain 4.77×10^{14} bacteria.
   The volume of the pond is 600 m^3.
   Calculate the average number of bacteria in each cubic metre of the pond.
   Give your answer in Scientific Notation.

10. The speed of light in a vacuum is approximately 2.998×10^8 metres per second.
    How far does light travel in one day?
    Give your answer in Scientific Notation.

11. In the year 2005, British Petroleum posted profits of 16.2 billion dollars.
    Calculate the profit BP made per minute in 2005.
    Give your answer in Scientific Notation.

12. The radius of the Earth at the equator is approximately 6.38×10^6 metres.
    Assuming the earth is circular at the equator, calculate its circumference.
    Give your answer in Scientific Notation.

13. A full grown adult female blue whale weighs about 1.65×10^5 kilograms.
    This is 60 times as heavy as a newborn blue whale calf.

    Calculate the weight of a newborn blue whale calf.
    Give your answer in Scientific Notation.

14. In June 2008, a census by the US state department estimated the population of Denmark to be 5.47×10^6.
    The same census put the population of China at 240 times that of Denmark.
    Calculate the population of China. **Give your answer in Scientific Notation.**

15. The total number of visitors to an exhibition was 3.465×10^5.
    The exhibition was open every day from 3rd April to 26th August inclusive.
    Calculate the average number of visitors per day to the exhibition.
    Give your answer in Scientific Notation.

16. In Astronomy, distances can be measured using different units.
    For example

    1 parsec = 3.08×10^{13} kilometres

    Calculate the number of kilometres in 4.2×10^3 parsecs.
    Give your answer in Scientific Notation.

17. Calculate

(a) $\dfrac{(4.2 \times 10^{5}) \times (3.4 \times 10^{-2})}{6.7 \times 10^{2}}$

(b) $\dfrac{(1.3 \times 10^{-2}) \times (2.33 \times 10^{9})}{7.5 \times 10^{3}}$

(c) $\dfrac{(4.5 \times 10^{5})^{2}}{2.88 \times 10^{-4}}$

(d) $\dfrac{9.32 \times 10^{6}}{(1.2 \times 10^{-3})^{2}}$

Give your answers in Scientific Notation.

18. The mass of water on the Earth's surface is 1.41×10^{18} tonnes.
The total mass of the Earth is 5.97×10^{21} tonnes.
Express the mass of water on the Earth's surface as a percentage of the total mass of the Earth.
Give your answer in Scientific Notation.

19. A major British company made £1.9×10^{3} profit each **minute** in the year 2007. The company had 78 400 employees that year.
Calculate the **annual** profit made per employee in the year 2007.
Give your answer in Scientific Notation.

20. A human body contains approximately 2.6×10^{13} blood cells.
At any one time the number of these which are white blood cells is about 7.5×10^{9}.
Express the number of white blood cells in the body as a percentage of the total number of cells.
Give your answer in Scientific Notation.