Activity 2 – Maths Booklet

Mark Scheme

Standard form

1. 0.0125 / 2.5 = 0.005
   5 x 10^{-3} moles / dm^3

2. 7.1 x 10^{-3} / 9.2 x 10^{-9} = 7.7 x 10^{-13} g / m^3

ai) 2.4 x 10^4 / 4 x 10^6 = 6 x 10^{-3}

6 x 10^{-3} x 100 = 0.6%

Rounding and significant figures

1. 0.024 3dp
   0.0237 3sf

2. 17.5 / 60 = 0.292 cm / day (3sf)
   The same number of significant figures that the height is given to in the question.

Units and Prefixes

1a) 0.6nm = 6 x 10^{-10}m

1b) 1.6 / 6 x 10^{-10} = 2.7 x 10^9 nucleotides

Converting units

1. mm micrometers nm
   x 1000
   ÷ 1000

2.

Nanometre	Micrometre	Millimetre
5	0.005	0.000005
1	0.001	0.000001
1000	1	0.001
1000000	1000	1
3000	3	0.003
7	0.007	0.000007
5000000	500	0.5

Examples:

1m = 1000mm

1m = 1000000µm

20000µm = 20mm

(c) 90 x 0.4 = 36 (oxygen needed by a fish of mass 0.4kg)

36 / 7 = 5.14 dm^3

Ratios

1. 450 / 4 = 112.5
   112.5 x 14 = 1575g

2. Beth = 15, Ali = 25, Clare = 32

3. 142 : 50

   2.84 : 1 (I know that the mathematicians among you will not like the decimal in the ratio, but we do use this in biology)

Percentage Change Questions

12a. (65 / 100065) x 100 = 0.06%

b. 16 cells

13. (-9 / 22) x 100 = -40.9%