Standard Form

A **Background**

1 $2.3 \times 4.7 =$

2 $9.35 \div 1.5 =$

3 $10^5 \times 10^7 =$

4 $10^3 \times 10^{-5} =$

5 $10^9 \div 10^7 =$

6 $10^3 \div 10^{-2} =$

B **Conversion into standard form**

1 35

2 3513

3 82.231

4 0.0000134

5 0.00020051

C **Conversion into ordinary form**

1 7×10^4

2 6.2301×10^{-7}

3 3.23181×10^3

4 6.137×10^{-5}

D **Multiplying two numbers together in standard form. Give your answer in standard form.**

1 $(8.61 \times 10^4) \times (7.2 \times 10^3) =$

2 $(6.237 \times 10^5) \div (3 \times 10^2) =$

3 $(3.9 \times 10^{-7}) \times (5.6 \times 10^5) =$

4 $(3.0055 \times 10^8) \div (5 \times 10^{-3}) =$

E **Problems. Give your answer in an appropriate form.**

1 An atom of gold has a diameter of 1.44×10^{-10} metres. An electron has a diameter of 2.8179×10^{-15}metres. How many electrons could fit across the radius of a gold atom?

2 A carbon-12 atom has a mass of 1.9926×10^{-26} kg. The Earth has a mass of approximately 5.9722×10^{24} kg. Assuming that the Earth is entirely made of carbon atoms, how many atoms would it take to make the Earth?

F **Ordering Numbers**

Below is a table showing information about the planets in our solar system.

Planet	Average Distance from the Sun (m)	Approximate Mass (kg)
Mercury	5.790×10^{10}	3.302×10^{23}
Venus	1.082×10^{11}	4.867×10^{24}
Earth	1.496×10^{11}	5.972×10^{24}
Mars	2.280×10^{11}	6.417×10^{23}
Jupiter	7.785×10^{11}	1.898×10^{27}
Saturn	1.432×10^{12}	5.683×10^{26}
Uranus	2.867×10^{12}	8.681×10^{25}
Neptune	4.515×10^{12}	1.024×10^{26}

1 The planets are ordered in terms of distance from the sun. Starting with the lightest, reorder the planets in terms of their approximate mass.

2 Assuming that all the planets are aligned on the same side of the sun, which two planets have the greatest distance between them?

3 Place the numbers below into ascending order.

a	8.52	$\frac{85}{9}$	8.51×10^{-2}	0.852	2×10^{3}	835.058
b	$\frac{4}{5}$	8×10^{-2}	9.2×10^{0}	0.92	$\frac{13}{15}$	7
c	1.092×10^{-2}	0.000109	$\frac{109}{1000}$	2	1.8×10^{3}	200

G **Investigation**

Using the data in the table below, do you think the planets have the same constituent elements in approximately equivalent amounts? You will need to demonstrate how you have determined your answer. (Hint: $\rho = \frac{m}{v}$)

Planet	Approximate Volume (m^3)	Approximate Mass (kg)
Mercury	6.078×10^{19}	3.300×10^{23}
Venus	9.289×10^{20}	4.870×10^{24}
Earth	1.083×10^{21}	5.970×10^{24}
Mars	1.632×10^{20}	6.420×10^{23}
Jupiter	1.431×10^{24}	1.898×10^{27}
Saturn	8.268×10^{23}	5.680×10^{26}
Uranus	6.835×10^{22}	8.680×10^{25}
Neptune	6.227×10^{22}	1.020×10^{26}