

Support Worksheet – Topic 1, Worksheet 1

- 1 Estimate the number of seconds in a year without using a calculator. Give your answer to 1 s.f. [1]
- 2 The distance between the Earth and the Sun is 1.5×10^{11} m. Estimate, without using a calculator, the time it takes light from the Sun to arrive at the Earth. [1]
- 3 Leo Kapitza asked Ernest Rutherford if he could take him as a research student. Rutherford said no because he had too many students. Kapitza asked Rutherford what was the greatest experimental uncertainty he could tolerate in his experiments, to which Rutherford replied 10%. ‘Then you can easily take me’, said Kapitza. What is the least number of students Rutherford could have had?
- A 4
- B 12
- C 20
- D 28 [1]
- 4 Which of the lists below contains fundamental SI units only?

A	newton	coulomb	kilogram
B	second	volt	mole
C	metre	ampere	kelvin
D	mole	metre	joule

- [1]
- 5 The force of resistance to the motion of a sphere in a fluid is given by $F = kv$, where v is the speed of the sphere. Express the unit of the constant k in terms of fundamental S.I. units. [1]
- 6 Simplify the ratio $\frac{8.0 \text{ mJ}}{4.0 \text{ nJ}}$. [1]
- 7 The acceleration of a body is 4.0 m s^{-2} and the mass of the body is 1.25 kg. The magnitude of the net force on the body to the correct number of significant figures is
- A 5 N
- B 5.0 N
- C 5.00 N
- D 5.000 N [1]



- 8** A quantity y is said to be proportional to a quantity x when the graph of y versus x is a
- A** straight line
 - B** straight line through the origin
 - C** straight line with positive slope
 - D** straight line with negative slope

[1]