UNIT 4 Proportional Reasoning

KEYWORDS AND DEFINITIONS

1	Direct Proportion Numbers or quantities are in direct proportion when the <u>ratio</u> of each pair of corresponding values is the same.
2	Inverse Proportion When variables are in inverse proportion, one of the variables increases as the other one decreases.
3	Multiplier The number doing the multiplying – linked to % Increase (20% Increase = X by 1.2), or to % Decrease (15% Decrease = X by 0.85)
4	Linear Having one dimension, in a straight line direction (Linear Relationship).
5	Congruent / Congruence Having the same shape and the same size: Equal sides and Equal angles.

6	Similar / Similarity Having the same shape, but not necessarily the same size. Angles are equal in size, but corresponding sides are multiplied or divided by the same scale factor. Triangles *PQR* and *ABC* are similar because they have equal angles. ● The scale factor $= \frac{PQ}{AB} = \frac{QR}{BC} = \frac{RP}{CA}$
7	Compound Unit Describes one unit in relation to another. ● Speed $= \frac{\text{Total distance travelled}}{\text{Total time taken}}$ Units such as m/s. km/h ● Density $= \frac{\text{Mass}}{\text{Volume}}$ Units such as g/cm³ ● Pressure $= \frac{\text{Force}}{\text{Area}}$ Units such as N/m²
8	Density / Population Density Measure of the amount of matter in a certain volume. ● Density $= \frac{\text{Mass}}{\text{Volume}}$ Units such as g/cm³
9	Pressure Measure of the amount of Force per unit area. ● Pressure $= \frac{\text{Force}}{\text{Area}}$ Units such as N/m²

NOTATION

10	Kilograms per metre cubed is written as kg/m^3.
11	Newtons per metre squared is written as N/m².
12	Metres per second is written as m/s.
13	Kilometres per hour is written as Km/h.

CORE SUCCESS CRITERIA

14	**Know the difference between direct and inverse proportion**
15	Recognise direct (Inverse) proportion in a situation
16	Know the features of a graph that represents a direct (Inverse) proportion situation
17	Know the features of an expression (or formula) that represents a direct (inverse) proportion situation
18	Understand the connection between the multiplier, the expression and the graph
19	Know the meaning of congruent (Similar) shapes
20	Identify congruence (similarity) of shapes in a range of situations
21	Identify the information required to solve a problem involving Similar shapes
22	Finding missing lengths in similar shapes
23	Understand why speed, density and pressure are known as compound units
24	Know the definition of density (pressure, population density, speed)
25	Solve problems involving density (pressure, speed)
26	Convert between units of density