Subject	Year	Month	
Mathematics	9	November	Balcarras From strength to strength

Topic:

DIRECT AND INVERSE PROPORTION

5 LESSONS

Content (Intent)

Prior Learning

Y8

- Find a relevant multiplier in a situation involving proportion (conversions, comparison, recipes, scaling, etc.)
- Compound units of **speed**
- Plot the graph of a linear function

Future Learning

- Harder relationships involving direct and inverse proportion
- Formulae for direct and inverse proportion

Objectives

- Know the difference between direct and inverse proportion
- Recognise direct proportion and inverse proportion in a **situation**
- Know the features of a **graph** that represents direct or inverse proportion
- Solve simple problems involving direct and inverse proportions of the nature
  - E.g. It takes 120 hours for four pumps to fill a swimming pool. How long would it take if five pumps were used?
- Solve problems involving compound units, such as **density** and **speed** (HIGHER SETS also apply on pressure)
- HIGHER SETS **Convert** between compound units of density and speed

For teaching purposes

Possible Questions

- Show me an example of two quantities that will be in direct (inverse) proportion. And another. And another …
- Convince me that this information shows a proportional relationship. What type of proportion is it?

40	3
60	2
80	1.5

- Which is the greatest density: 0.65g/cm^3 or 650kg/m^3? Convince me.
- It takes 6 hours for 20 workers to seed 40 acres. How long would it take 10 workers to seed 90 acres?

Misconceptions

- students will want to identify an additive relationship between two quantities that are in proportion
- The word 'similar' means something much more precise in this context than in other contexts students encounter. This can cause confusion.
- may think that a multiplier always has to be greater than 1

Pedagogical notes (implementation)

Up-to-date information about population densities of counties and cities of the UK, and countries of the world, is easily found online.

All students are taught to set up a 'proportion table' and use it to find the multiplier in situations involving direct proportion

How will understanding be assessed & recorded (Impact)

9BAM5 Compound units

End of term Assessment in December

Exams in May

How can parents help at home?

MathsWatch clips

KS3: R8, R11a, R11b, R13

GCSE: 199 (Proportion), 142 (Compound Measures)

Further reading/discussion

Reading / Enrichment

NRICH: In proportion

NRICH: Ratios and dilutions

NRICH: Similar rectangles

NRICH: Fit for photocopying

NRICH: Tennis

NRICH: How big?

Literacy

Direct proportion
Inverse proportion
Multiplier
Linear
Congruent, Congruence
Similar, Similarity
Compound unit
Density, Population density
Pressure

Notation
Kilograms per metre cubed is written as kg/m^3

Numeracy Links

Careers Links

Actuary
Financial analyst
Scientist
Mathematician