CONNECTIONS ACROSS THE CURRICULUM: Proportional Reasoning

Trillium Lakelands DISTRICT SCHOOL BOARD

MATHEMATICS

Fraction = Ratio = Decimal = Percent

$\frac{2}{5}$ = 2:5 = 0.40 = 40%

Equivalent Ratios

$\frac{2}{6} = \frac{1}{3}$ 2:6 = 1:3

Look for a multiplication relationship *between* ratios

x ?

5:60 = 35:*d*

Think: What do we multiply 5 by to get 35? Multiply 60 by the same number.

x 7 | 5 | 60 | x 7
35 | *d*

So, 60 x 7 = *d*
That is, *d* = 420

Look for a multiplication relationship *within* ratios

x ?

5:60 = 35:*d*

Think: What do we multiply 5 by to get 60? Multiply 35 by the same number.

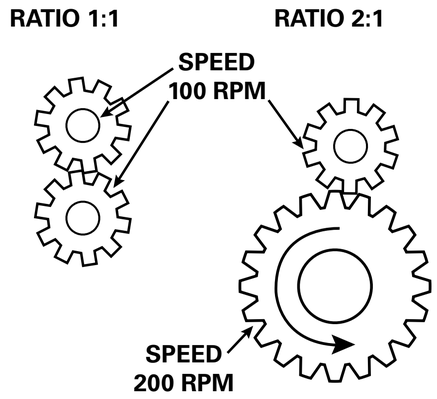
x 12 | 5 | 60 | x 12
35 | *d*

So, 35 x 12 = *d*
That is, *d* = 420

A dose of 420 mg is needed for a body mass of 35 kg.

TECHNOLOGICAL STUDIES

Gear Ratios

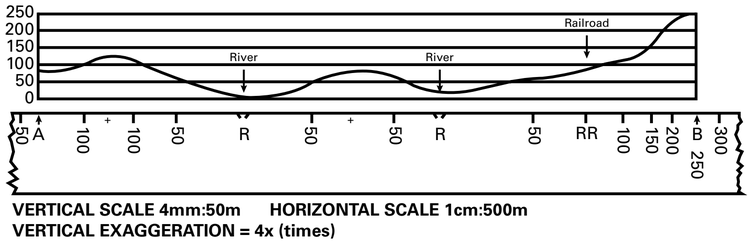


Fuel Mixing Ratios

Fuel to Oil Ratios			
Ratio Fuel-Oil	ml oil per 1 litre fuel	ml oil per 5 litre fuel	Shown as percentage
20-1	50	250	5.00%
25-1	40	200	4.00%
30-1	33	167	3.33%
35-1	29	143	2.86%
40-1	25	125	2.50%
50-1	20	100	2.00%

GEOGRAPHY

Map Scales



VERTICAL SCALE 4mm:50m HORIZONTAL SCALE 1cm:500m
VERTICAL EXAGGERATION = 4x (times)

$$\text{Vertical Exaggeration} = \frac{\text{horizontal scale}}{\text{vertical scale}}$$

$$= \frac{500\text{ m (1 cm : 500 m)}}{125\text{ m (4 mm : 50 m)}}$$

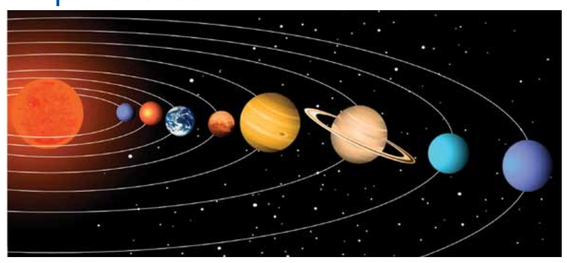
SCIENCE

Rate

Describe the relationship between carbon dioxide levels and global temperatures.

Scale

Using everyday materials, construct a physical representation of the solar system which accurately depicts the difference in the planet sizes.



Proportional Reasoning

Proportional thinking involves the use of multiplicative relationships, in the form of rates, ratios, and percents, to solve problems.

Ratios, rates, and percents, just like fractions and decimals, are comparisons of quantities.

- A ratio compares quantities with the same unit, for example, 2 boys to 3 girls (the unit being children).
- A rate compares quantities with different units, for example, distance to time, or price per number of items.
- A percent always compares a quantity to 100.*

*(Small, M. (2009). Big Ideas for Teaching Mathematics, Grades 4 to 8. Toronto, ON: Nelson Education Inc.)