**Maths for**

**National 5 Environmental Science**

**Ratio**

Ratios are used to compare two or more different quantities.

Sometimes the ratio will be straightforward and will not require any further calculation.

**Example**: if we have 4 tigers and 3 lions then the ratio is expressed as 4:3.

More commonly though, you will be asked to simplify a ratio into a simple whole number ratio, ie divide each number by a common number until you get the simplest ratio.

**Example**: if you had a ratio of 6:4 then each number can be divided by 2 to create a simpler ratio of 3:2.

**Exercise:**

Simplify the following ratios as far as possible.

1. 8:10 b) 12:15 c) 14:35 d) 12:28 e) 2:2 f) 20:35

g) 54:24 h) 27:54 i) 11:66 j) 800:8 k) 34:17 l) 44:33

**Past Paper Question**



**Percentages**

**Calculating Percentage**

When something is divided into 100 pieces each piece is called 1 per cent (French: per = for cent= 100).

**Examples** 34% = 34 out of 100 = 34/100 = 0.34 8% = 8 out of 100 = 8/100 = 0.08

If we wish to find 17% of 450 then our calculation would be: (17/100) x 450 = 76.80

**Exercises:**

1. 11% of 90m b) 2% of 350 c) 9% of 24 d) 44% of £12.50

e) In 2005 a conifer tree was 2.5 metres tall. By 2010 it had grown 40%.

(i) How much had it grown? (ii) What was its new height?

f) During a storm the school lost 8% of its roof tiles. If the roof had 850 tiles before the storm, how many were lost?



**Calculating Percentage Increase**

**Example**

My solar panel should have cost me £900 but the price rose by 7%.

Old price: £900

Increase: (7% of 900) = (7/100 x 900) = £63

New price: £900 + £63 = **£963**

**Exercises**

1. The temperature in a furnace was 600˚C. It rose by 13%. What is the new temperature?
2. A holiday to an eco tourist resort for a family of 4 cost £10,500 last year. This year the price rose by 8%. How much does it cost this year?

**Calculating Percentage Decrease**

**Example**

The temperature during a warm summer’s day was 24˚C at noon. By 8pm it had fallen by 25%.

Old temperature = 24˚C

25% Decrease: 25/100 x 24 = 6˚C

Temperature decrease = 24˚C - 6˚C = **18˚C**

**Exercises**

a) 8.2cm of snow fell one evening. By noon the following day 30% had melted. What was the depth of the remaining snow?

b) A container was left on a windowsill with 4 litres of water inside it and 15% was evaporated by the sun. How much water was left in the container?

**Past Paper Questions**



**2004 Past Paper**



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**Graphs**

**Describing Trends**

Often you are asked to describe a trend or overall pattern of a graph or table.

You should: **refer to the figures** in the graph or table

identify whether it is **increasing** or **decreasing** over time

state whether it fluctuates (goes up and down a lot) or is fairly stable and

identify any **significant features** (things that stick out)

**Past Paper Question**





**% with powers of 10**





**Example: Amount of sunlight captured/ amount of sunlight in total x 100 = 1%**