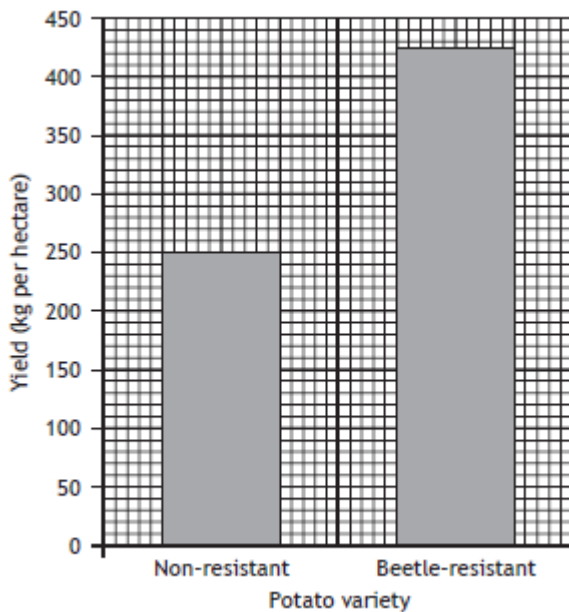
Numeracy in Science is used to do calculations to analyse results from investigations.

Finding the difference
When a question asks you to calculate the difference between two values, you should take the smaller number away from the bigger number.

Example
*Calculate the difference in yield between the two varieties.*

Difference = bigger number – smaller number

Difference = 425 – 250

Difference = 175

How many times greater
When a question asks you to calculate how many times greater one value is compared to another, you divide the bigger number by the smaller number.

Example
Calculate how many times greater the average number of lugworms at 11 metres is compared to 7 metres from the seawater at low tide.
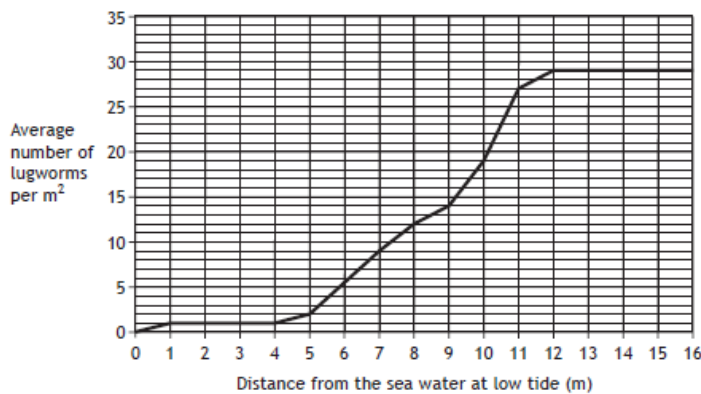
Times greater = bigger number ÷ smaller number

Times greater = 27 ÷ 9

Times greater = 3

Average
When a question asks you to calculate an average, you should add up all of the numbers and divide by the number of numbers.

Example
Calculate the average number of leafy lichen species present at the four sites.

Site	Number of lichen species present		
	Shrubby	Leafy	Crusty
A	0	5	19
B	3	2	0
C	16	3	0
D	7	14	2

Average = total ÷ number of numbers

Average = (5 + 2 + 3 + 14) ÷ 4

Average = 24 ÷ 4

Average = 6

Finding a percentage
When a question asks you to calculate a number from a percentage, you should divide the percentage by 100 number and multiply by total.

HINT: look at the support line- it should be a unit of measurement or blank

Example
Body mass is 70% water. The student had a body mass of 65 kg. Calculate the mass of water in the student's body.

Number = (percentage ÷ 100) x total

Number = (70 ÷ 100) x 65

Number = 0.7 x 65

Number = 45.5

Expressing a number as a percentage
When a question asks you to calculate a percentage from a number, you should divide the smaller number by the total number and multiply by 100.

HINT: look at the support line- it should have a percentage symbol (%)

Example
Calculate the percentage of the family who did not have the mutation for high bone density.

20 members of the family provided blood samples for DNA and biochemical testing. 7 of them were found to have high bone density. The same tests were performed on another group of 20 unrelated individuals with normal bone density.

Percentage = (smaller number ÷ total) x 100

Percentage = (7 ÷ 20) x 100

Percentage = 0.35 x 100

Percentage = 35%

Ratios

When a question asks you to calculate a simple whole number ratio, you should select the correct numbers and write them down in the order they appear in the question. Then you simplify the ratio by finding the highest common factor.

- First, try dividing the bigger number by the smaller number.
- If this doesn't give a whole number then
    - Divide by 2 if both numbers are even
    - Divide by 3 if both numbers are odd
    - Divide by 5 if both numbers end in a 0 or a 5
- Keep going until you have a prime number

Example
The actual results were 90 tall and 36 dwarf plants.
Calculate the simplest whole number ratio for these results.

90 : 36

30 : 12   (both numbers can be divided by 3)

10 : 4   (both numbers are even so divide by 2)

5 : 2   (5 is a prime number and cannot be simplified further)

When a question asks you to calculate the expected number from a ratio you should, find out how many parts are in the ratio by adding the two numbers in the ratio together. You then divide the total by the number of parts. Finally you multiple by the number within the ratio to get the expected number.

Example
The expected ratio in the F_2 generation was 3 tall to 1 dwarf.
Calculate the expected number of tall plants if there were 144 plants produced in this generation.

Number parts = 3 + 1

Number parts = 4

Expected number = (total ÷ number parts) x number in the ratio

Expected number = (144 ÷ 4) x 3

Expected number = 36 x 3

Expected number = 108