Ratios

You must divide all numbers involved by the same common denominator (a number which can divide evenly into all the numbers involved, without leaving any remainder).

Simplify it as much as possible.

Remeber they must all be **whole numbers** i.e. no decimals.

Eg. 35:21:14 all these numbers divide by 7 so the **simple whole number ratio** =   **5:3:2**

1.   An experiment was carried out to investigate stem height in pea plants.

The parent plants were both homozygous. When they were crossed the F_1 generation were all tall. These plants were then crossed with each other to produce the F_2 generation.

The results obtained in the F_2 generation differed from the expected results.

The actual results were 90 tall and 36 dwarf plants.

Calculate the simplest whole number ratio for these results.   1

_____ : _____
        tall   dwarf

2.   The table shows some information about causes of adult deaths in Scotland.

Cause of adult deaths	Number of adult deaths (per 100 000 population)	
	Males	*Females*
Cancer	385	274
Coronary heart disease	165	105
Chronic obstructive pulmonary disease	71	58

Calculate the simple whole number ratio of male deaths to female deaths due to coronary heart disease.   1

_____ : _____
        Males   *Females*

3. In a survey of 90 students it was found that 25 of them had hitchhiker's thumb.

    Calculate the number of students with straight thumb to hitchhiker's thumb as a simple, whole number ratio.   1

    _____ : _____
      straight   hitchhiker's
       thumb   thumb

4. A study was carried out into the percentage of amino acids present in the blood of people with different diets.

    One group tested were meat eaters and the other group were vegetarians.

    In both groups, samples were analysed to show the percentage of amino acids in their food and in their blood after digesting the food.

    The results are shown in the table.

Amino acid	Amino acid present (%)			
	Meat eaters		Vegetarians	
	In food	In blood	In food	In blood
Arginine	5·5	1·6	6·4	1·4
Leucine	8·0	5·4	7·0	5·0
Lysine	6·4	6·4	4·8	4·8
Serine	4·8	5·4	5·0	5·4
Threonine	4·0	3·8	3·8	3·8
Tyrosine	3·2	2·0	3·0	1·8

    Calculate the simple, whole number ratio for tyrosine to serine in the blood of vegetarians.   1

    _____ : _____
       tyrosine   serine

5. When 1000 people were surveyed, 625 people were found to clasp their hands with the left thumb on top.

   What is the simple whole number ratio of left to right thumb people?

   _____   _____

   left thumb   : right thumb   **1**

6. The following table shows the changes in the flow of blood through the capillaries in some body organs at rest and during exercise.

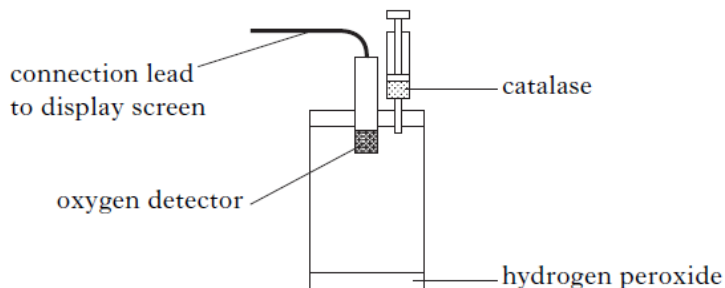| Body organs	Capillary blood flow (cm³/min)	
	At rest	*During exercise*
heart muscle	260	650
brain	760	760
skin	380	1200
intestine	1160	540

   How does the capillary blood flow through the heart muscle at rest compare to that during exercise, expressed as a simple whole number ratio?

   _____ : _____
   at rest   during exercise   **1**

7. The apparatus shown below was used to study the effect of different temperatures on the activity of the enzyme catalase.

connection lead to display screen

catalase

oxygen detector

hydrogen peroxide

The catalase was added and reacted with the hydrogen peroxide to release oxygen. The increase in oxygen compared to the starting value was recorded as a percentage.

This was carried out at five different temperatures and the results are shown below.

Temperature (°C)	Increase in oxygen (%)
4	0·55
21	0·80
34	1·45
40	1·05
50	0·05

Calculate the simple whole number ratio of percentage increase in oxygen at 34 °C, 40 °C and 50 °C.

_____ : _____ : _____
34 °C   40 °C   50 °C

1

8. Candytuft is a plant with white or pink flowers. The two forms of the gene responsible for the flower colour are:

P = pink flowers   and   **p** = white flowers.

The offspring actually consisted of 24 pink flowered and 16 white flowered plants.

What is the simplest whole number ratio of pink to white flowered plants in the offspring?

_____ : _____
pink : white

1