

Average

1. Calculate the average rate of movement of liquid in the glass tubing.

Space for calculation

<i>Time (minutes)</i>	<i>Liquid level (mm)</i>
0	10
10	22
20	32
30	40
40	48
50	56
60	64

2. Complete the table to show the average mass of one limpet.

Space for calculation

<i>Organism</i>	<i>Population</i>	<i>Average mass of one organism (g)</i>	<i>Biomass of population (g)</i>
Seaweed	220	500	110 000
Limpet	1 100		33 000
Crab	100	90	9 000
Gull	5	700	3 500

3. Complete the table by calculating the average width of the leaves from the vertical stem.

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<i>leaf</i>	<i>Leaf width (mm)</i>	
	<i>Horizontal stem</i>	<i>Vertical stem</i>
1	52	32
2	60	34
3	56	35
4	50	44
5	52	35
average	54	

- 4.

	<i>Average abundance of each plant</i>		
<i>Year</i>	<i>Meadow grass</i>	<i>Ragwort</i>	<i>Pink campion</i>
2011	8	15	9
2012	16	14	7
2013	24	12	4
2014	25	8	2
2015	25	5	1

Calculate the average decrease per year in the abundance of ragwort over the five-year period.

Space for calculation

1

Average

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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

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

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Space for calculation

6

Complete the table by calculating the average number of mitochondria per cell in skin epithelium.

1

Space for calculation

Cell type	Number of mitochondria per cell			
	Cell 1	Cell 2	Cell 3	Average
Muscle	1352	1203	1450	1335
Skin epithelium	250	330	275	
Lymphocyte	953	1112	860	975

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Sample site	Soil moisture (units)	Number of plants		
		Species E	Species F	Species G
1	20.2	11	15	12
2	23.4	13	14	11
3	22.1	12	16	10
4	24.5	15	17	15
5	26.6	18	13	12
6	28.4	19	15	14

Calculate the average number of plants per sample site for species F.

1

Space for calculation

8

The number of stomata on both surfaces of five leaves was counted and averages calculated.

The results are shown in the table.

Leaf	Number of stomata	
	Upper surface	Lower surface
1	4	12
2	20	23
3	8	15
4	12	22
5	16	
Average	12	18

Complete the table to include the number of stomata on the lower surface of leaf 5.

1

Average

- 8 Students investigated the distribution of some organisms on a rocky shore. Starting at the lowest tide level, quadrats were placed every two metres along a single transect line and the number of barnacles and mussels were counted. The results are shown in the table.

Position on shore	Quadrat number	Number of barnacles	Number of mussels
<div> <div>Low tide level</div> <div>↓</div> <div>High tide level</div> </div>	1	7	60
	2	13	58
	3	18	55
	4	15	50
	5	24	32
	6	41	30
	7	42	18
	8	47	13
	9	53	4
	10	54	0

- 9 The area covered with Caledonian forest has decreased over time. In an attempt to reverse this decrease, some areas are being planted with or type of conifer tree, the Scots pine, or a variety of broad-leaved trees. The table shows the number and types of tree planted in six areas between 2000 and 2010.

Area	Number of trees planted	Type of tree planted
1	6725	Scots pine
2	7900	broad-leaved
3	9430	Scots pine
4	11 845	broad-leaved
5	8475	Scots pine
6	9325	broad-leaved

For the areas planted with conifer trees, calculate the average number planted per area during this time.

Space for calculation

- (a) (i) Calculate the average number of mussels per quadrat.

Space for calculation

Average

1. 0.9
2. 30 (33000/1100)
3. 36
4. 10.8 (54/5)
5. 6 (24/4)
6. 285
7. 18
8. 32
9. 8210