Predict

1. When investigating the distribution of bluebell plants in a woodland, five quadrats were thrown randomly.

   Soil moisture and bluebell abundance values were recorded for each quadrat.

   The results are shown in the table.

Quadrat	Soil moisture (%)	Bluebell abundance
1	10	5
2	36	25
3	22	14
4	31	20
5	14	7

   Predict the bluebell abundance if the soil moisture was 34%.

   A   13

   B   19

   C   23

   D   27

2. Haemoglobin's ability to bind to oxygen is affected by the pH of the blood.

   The table shows the percentage of haemoglobin bound to oxygen at different pH levels.

pH of blood	Percentage of haemoglobin bound to oxygen
7.1	
7.2	60.0
7.4	69.0
7.5	73.5

   The percentage of haemoglobin bound to oxygen when the pH of blood is 7.1 is likely to be

   A   42.0

   B   51.0

   C   55.5

   D   59.9

3. The bar chart shows the percentage loss in yield of four crops and the cause of loss.
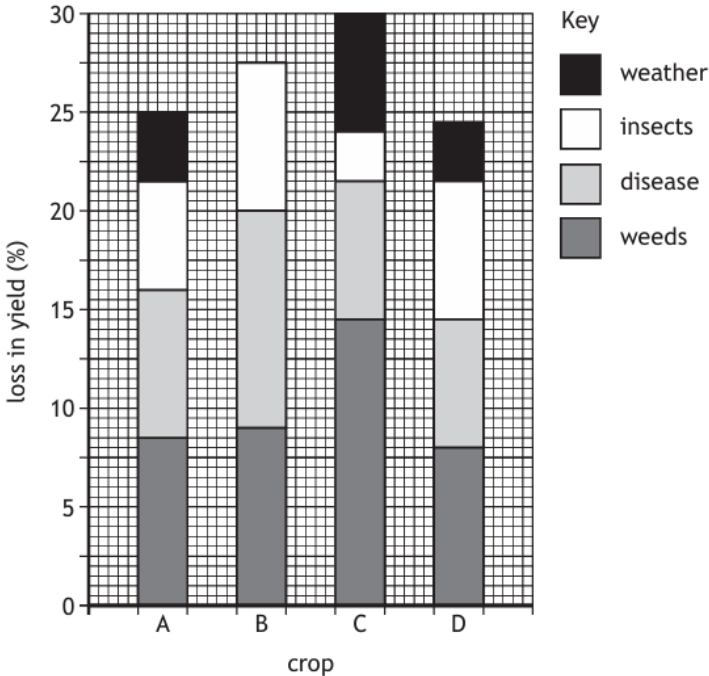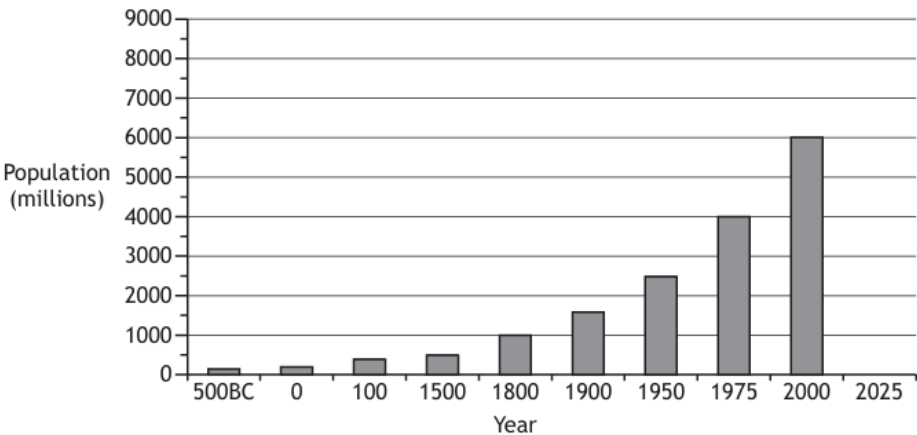

   To reduce losses, pesticides can be sprayed onto the crops to kill weeds and insects.

   Predict which crop is most likely to show the greatest percentage increase in yield, when the crops are sprayed with pesticides.

4. The graph below shows information about the growth of the human population.

Population (millions)

Year

If the population continues to increase at the same rate as between 1975 and 2000, predict the population size in 2025.

A 7000

B 7500

C 8000

D 8500

The graph shows survey results of estimated grey seal pup populations every two years from 2010 to 2016.

estimated grey seal pup population (thousands)

year
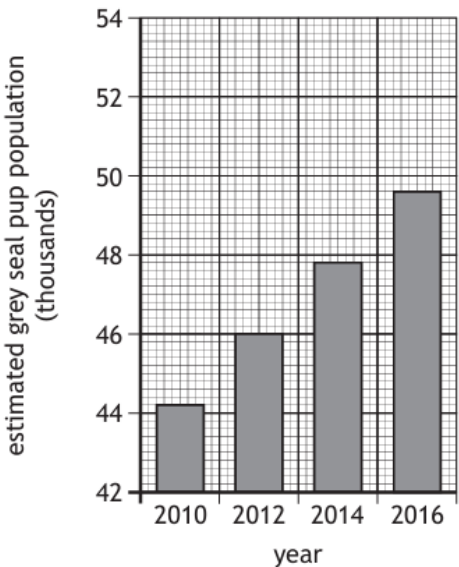
If the grey seal pup population continues to increase by the same number at each survey, what will the estimated population be in 2020?

A 51 400

B 53 200

C 55 000

D 56 800

Predict

1.

Temperature (°C)	Fresh mass of tomatoes (g/plant)	Dry mass of tomatoes (g/plant)
14	1000	50
18	8300	415
22	9000	450
26	2200	110
32	1600	80

Using the information in the table, predict the fresh mass of tomatoes which will be produced at 35 °C.
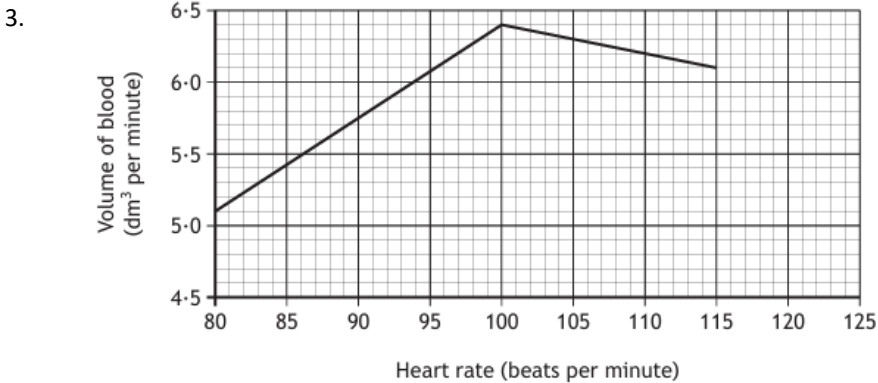
Space for calculation

_____ g/plant

2.

Temperature (°C)	Volume of oxygen released in one hour (cm³)		
	Experiment 1	Experiment 2	Average
10	0·7	0·5	0·6
20	1·6	1·4	1·5
30	2·7	1·9	2·3
40	2·0	2·6	2·3
50	0·3	0·5	0·4

Predict the average volume of oxygen released in one hour if the experiment was carried out at a temperature of 60 °C. 1

3.

Predict the volume of blood pumped by the left ventricle at 120 beats per minute. **1**

_____ dm³ per minute

4. A study was carried out to investigate the effect of using the chemicals ethanol and methanol on bacterial growth.

Controls without either chemical were also set up.

The results in the table show the growth of three species of bacteria as a percentage of the overall bacterial growth in the control experiment.

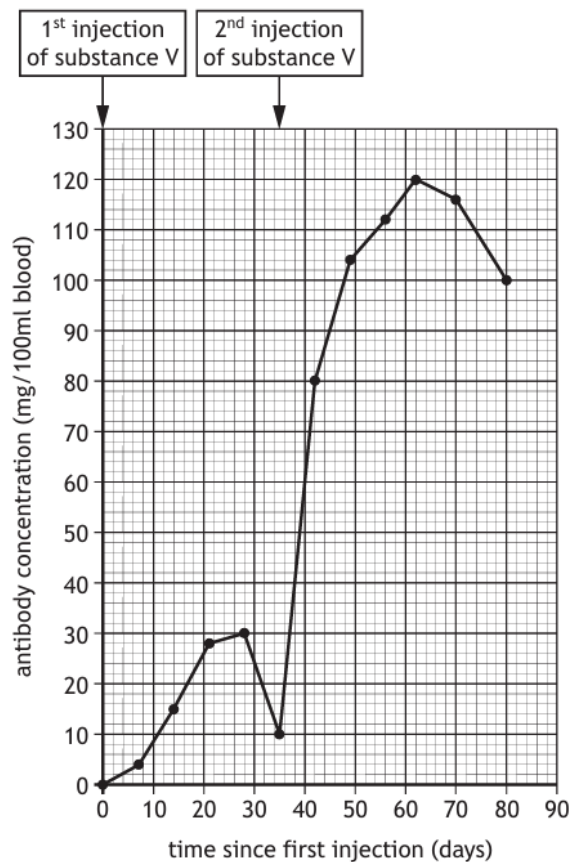| Species of bacteria	Bacterial growth (percentage of control)	
	Ethanol treatment	Methanol treatment
S. flexneri	36	54
V. cholerae	45	44
S. paratyphi	4	12

The researchers used a 6% ethanol solution in their study.

Predict the effect of using a 3% ethanol solution instead, on the growth of the bacteria. **1**

_____

_____

5.
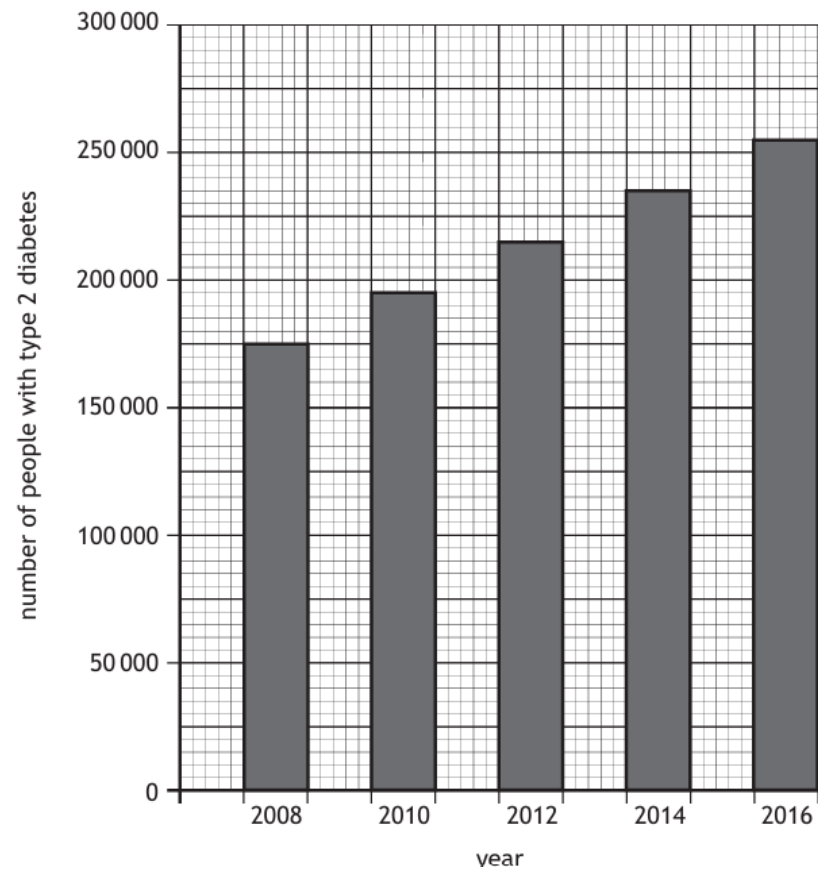

If the trend continues as shown in the graph, predict the antibody concentration on day 90.   1

Space for calculation

_____ mg/100 ml

6.   The graph shows the number of people in Scotland with type 2 diabetes over a period of nine years.

If the trend shown continued, predict the number of people that would be expected to have type 2 diabetes in 2018.   1

_____

Predict

7. The table shows the effect of training at different altitudes on athletes' red blood cell count.

Altitude (km)	Average red blood cell count (million/ml of blood)
0	4.4
0.5	5.0
1.0	5.6
2.5	6.2
3.5	7.4
5.0	8.8
5.5	9.4

Using information from the table, predict the average red blood cell count of an athlete training at an altitude of 3.0 km. **1**

_____ million/ml of blood

8.

Concentration of salt solution (g/100 cm^3)	Percentage change in mass (%)
1	+17
3	+11
6	−2
8	−9
10	−16

Predict the percentage change in mass in a 2 g/100 cm^3 salt solution. **1**

_____ %

Predict

1.   C

2.   C

3.   C

4.   C

5.   B

1.   Any value less than 1600

2.   Any value less than 0.4

3.   6 approximately from line   (extend the line to 120)

4.   Bacterial growth would increase

5.   84 (extend line down)

6.   275 000

7.   6.8 (difference is 1.2 divide by 2 = 06 increase therefore 6.2 + 0.6 = 6.8

8.   Any value between 11 and 17