Drawing Conclusions

1. The enzyme catalase increases the rate of the reaction shown.

hydrogen peroxide ⟶ water + oxygen

An experiment was carried out to investigate the effect of copper nitrate concentratio catalase activity. The catalase activity was determined by measuring the time taken to collect 10 cm^3 of oxygen in the presence of different concentrations of copper nitrate.

The results are shown in the table.

Copper nitrate concentration ($mol\ l^{-1}$)	Time taken to collect 10 cm^3 oxygen (seconds)
0.2	8
0.3	12
0.4	15
0.6	18
0.8	19
1.0	20

The conclusion for this experiment is, as copper nitrate concentration increased the

A time taken to collect 10 cm^3 oxygen increased

B time taken to collect 10 cm^3 oxygen decreased

C catalase activity increased

D catalase activity decreased.

2. An investigation was carried out to determine the respiration rate of maggots at different temperatures.

A probe was used to measure the CO_2 concentration in a sealed flask containing 20 maggots over a 10 minute period at three different temperatures.

The results are shown in the table.

Time (minutes)	CO_2 concentration (ppm)		
	3 °C	20 °C	30 °C
0	7100	7315	7105
2	7760	8010	8330
4	8160	8920	10 480
6	8500	9940	11 980
8	8840	11 840	13 470
10	9150	13 040	15 200

The conclusion relating to the aim of this investigation is, as the temperature increases the rate of

A CO_2 production increases

B CO_2 production decreases

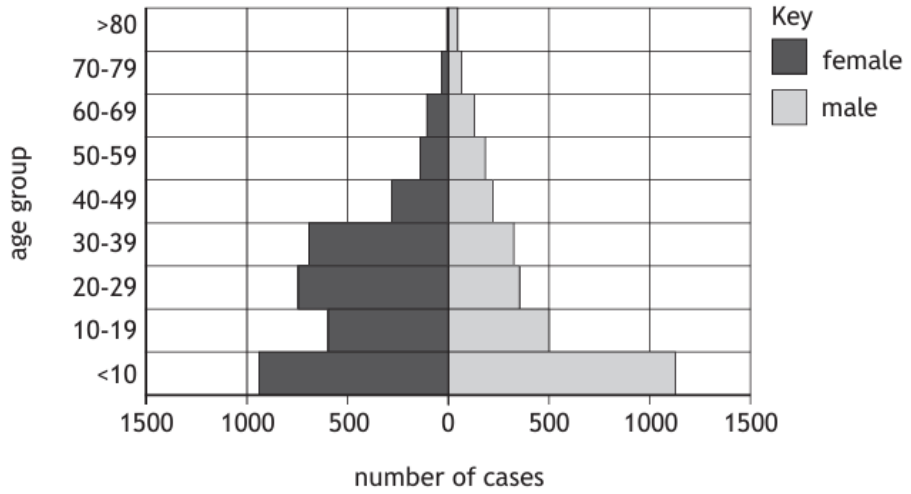
C respiration increases

D respiration decreases.

Drawing Conclusions

3. Cryptosporidium is a parasite that causes individuals to suffer from severe diarrhoea.

The graph shows details of the number of cases of cryptosporidium infection in a country in 2016.



What conclusion can be drawn from the graph?

A In all age groups there are fewer cases in females than males

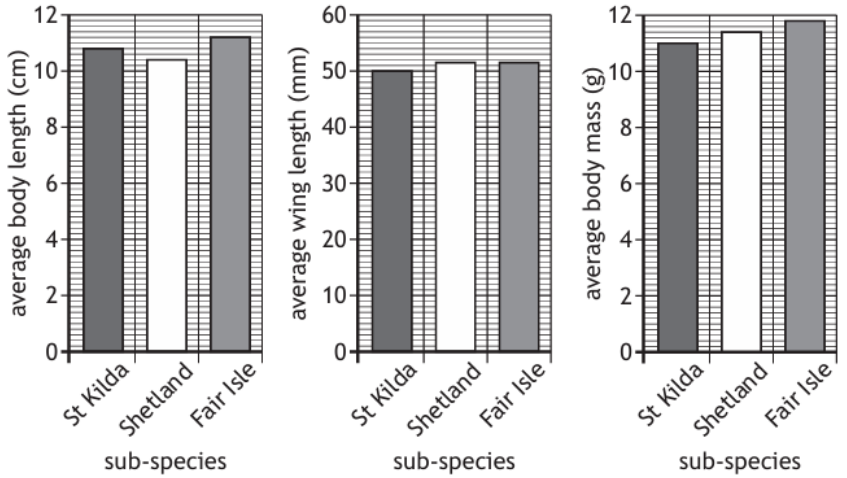
B In all age groups there are fewer cases in males than females

C As the age group of females increases the number of cases always decreases

D As the age group of males increases the number of cases always decreases

4. Subspecies of the wren (*Troglodytes troglodytes*) have evolved in different island areas in Scotland.

The graphs show averages of body length, wing length and body mass for wrens from the islands of St Kilda, Shetland and Fair Isle.



Which of the following conclusions can be drawn from this data?

A Shetland and Fair Isle wrens have a greater average wing length and body mass than St Kilda wrens

B St Kilda and Fair Isle wrens have a greater average body length and wing length than Shetland wrens

C St Kilda wrens are smaller in each characteristic than the other two subspecies

D Fair Isle wrens are larger in each characteristic than the other two subspecies

Drawing Conclusions

5. An investigation was carried out to determine the effect of lead ion concentration on the activity of the enzyme amylase.

The results are shown in the table.

Lead ion concentration (mol l^{-1})	*Amylase activity* (% of control)
0·0 (control)	100
0·1	84
0·2	23
0·3	11
0·4	2
0·5	0

A conclusion that can be drawn from these results is that inhibition was

A highest at high lead ion concentrations
B highest at low lead ion concentrations
C lowest at lead ion concentration 0·5 mol l^{-1}
D highest at lead ion concentration 0·1 mol l^{-1}.

6. The table contains information about the relative genome sizes and number of genes found in a variety of organisms.

Organism	Size of genome (million base pairs)	Number of genes
Human	3080	30 000
Mouse	2600	25 307
Fruit fly	120	13 601
Yeast	12	6294
Mosquito	278	13 688
Nematode worm	97	19 873
Thale cress	125	25 000

What conclusion can be drawn from the data in the table?

A The larger the genome, the fewer genes it contains.
B There is no relationship between genome size and number of genes.
C The larger the genome, the more genes it contains.
D The smaller the genome, the more genes it contains.

7. An experiment was set up to investigate the effect of different respiratory substrates on the rate of respiration in yeast. Methylene blue can be used to measure the rate of respiration as it changes from dark blue to colourless when it accepts hydrogen ions. Four test tubes were set up, each containing yeast, methylene blue and one of the respiratory substrates.

The table below shows the results of this investigation.

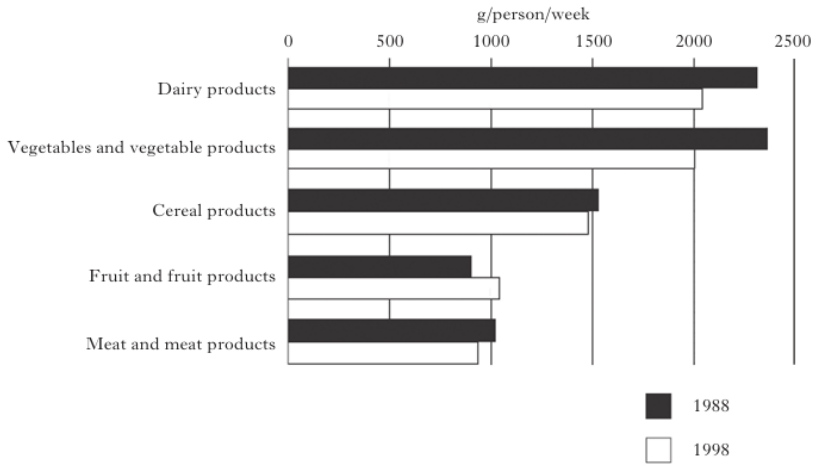
Test tube number	*Respiratory substrate*	*Appearance of the methylene blue after 20 minutes*
1	starch	dark blue
2	sucrose	light blue
3	lactose	dark blue
4	glucose	colourless

Which of the following conclusions is correct?

The rate of respiration is

A higher with starch than with glucose
B lower with sucrose than with lactose
C higher with glucose than with lactose
D lower with glucose than with sucrose.

8. The graph below shows how the UK diet changed between 1988 and 1998.



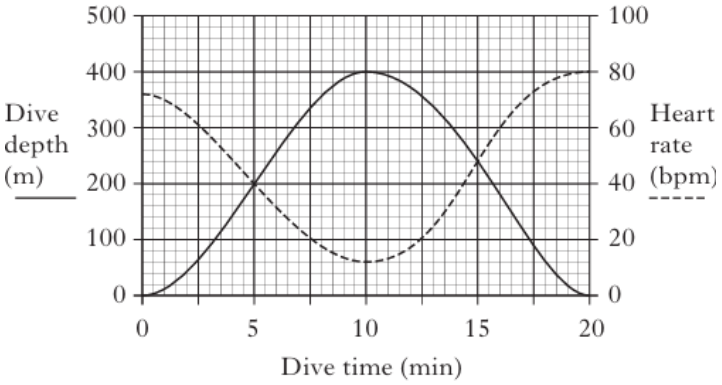
Which of the following conclusions can be drawn from the data?

A People ate more food in 1998 than in 1988.
B People ate less food in 1998 than in 1988.
C People ate a greater variety of food in 1998 than in 1988.
D People ate a lesser variety of food in 1998 than in 1988.

Drawing Conclusions

9. Seals dive to hunt for fish and squid.

The graph below shows how a seal's heart rate changed during a dive.



Which of the following conclusions can be drawn from the graph?

The heart rate of the seal

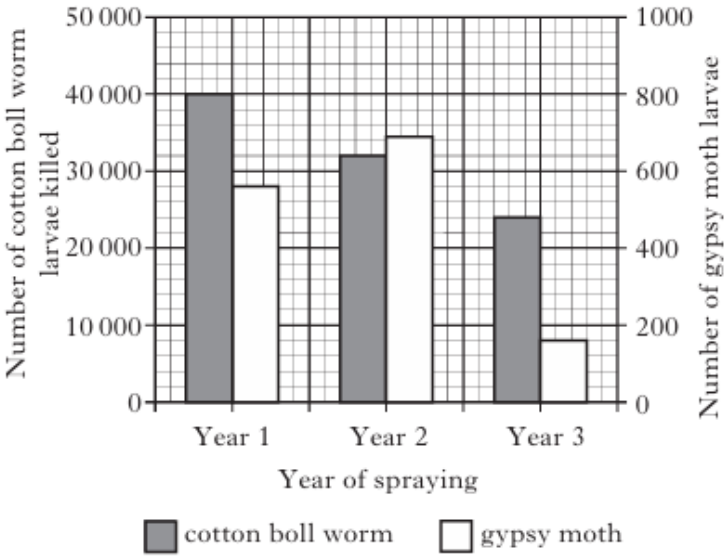
A reaches its maximum 10 minutes into dive

B decreases as dive depth increases

C increases as the seal dives to 400 m

D decreases as the seal resurfaces.

10 The larvae of gypsy moths and cotton boll worms are pests of tree leaves. An experimental plot of infested trees was sprayed with insecticide in three different years. The numbers of each larvae killed in each year is shown in the graph below.



Which of the following conclusions can be drawn?

A More gypsy moth larvae were killed than cotton boll worm larvae in year 2.

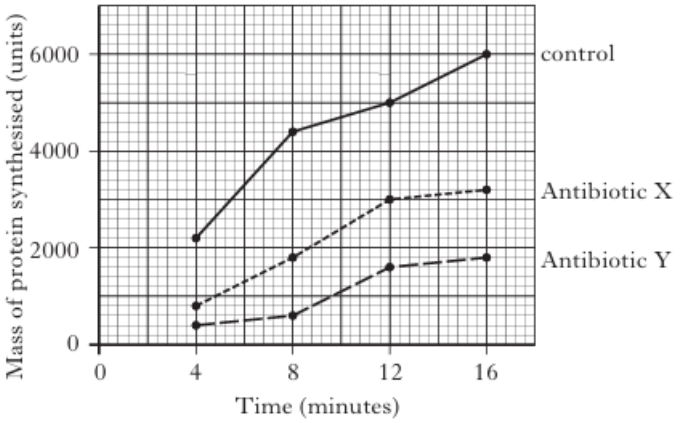
B The larvae became more resistant to the insecticide each year.

C The number of gypsy moth larvae killed was always less than cotton boll worm larvae killed.

D The percentage of cotton boll worm larvae surviving decreased each year.

11 An experiment was carried out to compare the effect of two antibiotics, X and Y, on the rate of protein synthesis in bacterial cells.

The results are shown in the graph below.



Which of the following conclusions from the graph is valid?

A Antibiotic X was less effective than antibiotic Y in inhibiting bacterial protein synthesis.

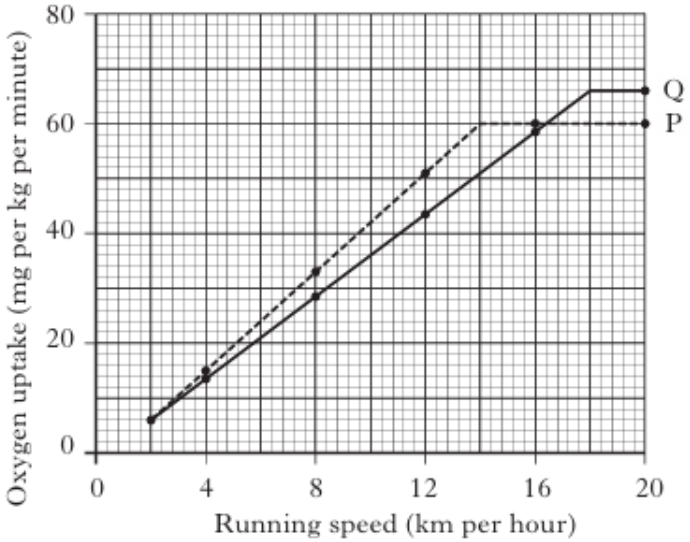
B Antibiotic Y was less effective than antibiotic X in inhibiting bacterial protein synthesis.

C Bacterial protein synthesis was inhibited to the greatest extent without antibiotics.

D The rate of protein synthesis was greatest between 12 and 16 minutes in all cases.

Drawing Conclusions

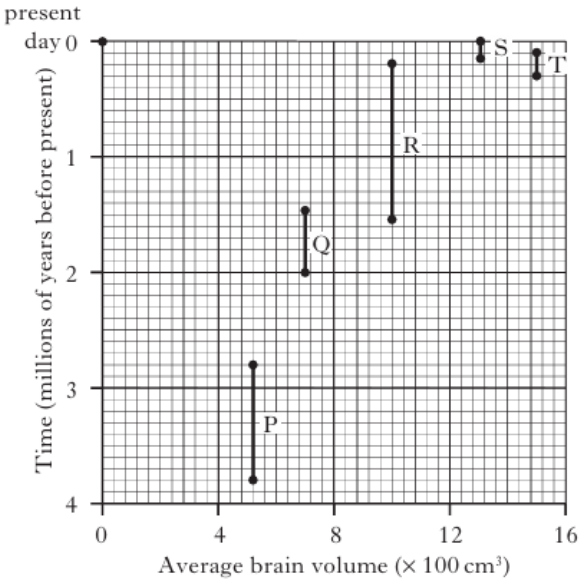
12 The graph below shows how running speed affected the oxygen uptake of two athletes P and Q.



Which line in the table below shows correctly the fittest athlete based on the information in the graph and the reason for this conclusion?

	Athlete	*Reason for conclusion*
A	P	reached their maximum running speed sooner
B	P	reached their maximum oxygen uptake sooner
C	Q	had a higher running speed than P
D	Q	had a higher maximum oxygen uptake than P

13 The graph below shows the average brain volume of several related species of hominid and the time periods during which they lived.



Key

P – *Australopithecus afarensis*

Q – *Homo habilis*

R – *Homo erectus*

S – *Homo sapiens* (modern humans)

T – *Homo neanderthalensis*

Which conclusion can be drawn from the graph?

A *Homo sapiens* is the most intelligent species.

B *Homo neanderthalensis* had the largest brain.

C *Homo sapiens* evolved from *Homo erectus*.

D The more recently the species lived the larger its brain volume.

Explanations for data

14 The table below shows the number of beet armyworm larvae found in plots of cotton plants.

Some plots were treated with insecticide on 27 June and 1 August and other plots left untreated.

		Number of beet armyworm larvae	
Sampling date		Treated plots	Untreated plots
July	8	3	3
	15	33	2
	22	22	17
	29	42	10
August	5	120	8
	12	160	10

Which of the following is the most likely explanation for the differences between the treated and untreated plots?

A The insecticide kills a predator of the larvae

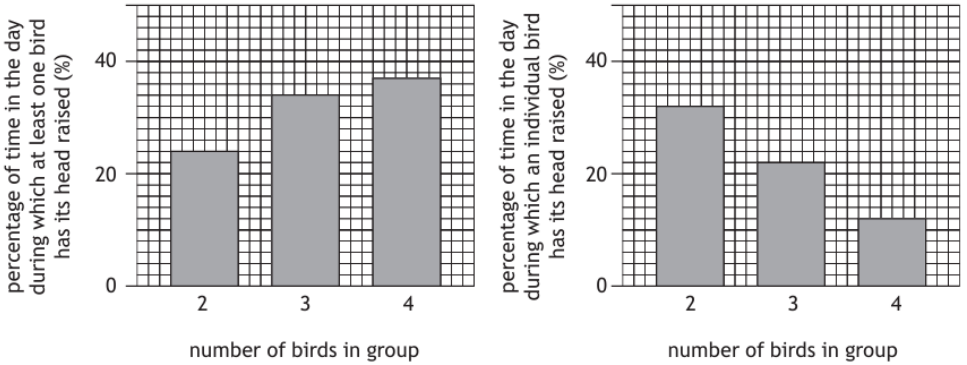
B The larvae are resistant to the insecticide

C The beet armyworm breeds in July

D The larvae have a short lifecycle

15 Ostriches are large birds that live on open plains in Africa. They divide their time between feeding on vegetation and raising their heads to look for predators.

The graphs show the results of a study on the effect of group size in ostriches on their behaviour.



Which of the following is a valid conclusion from these results?

In larger groups, an individual ostrich spends

A less time with its head raised so the group is less likely to see predators

B less time with its head raised but the group is more likely to see predators

C more time with its head raised so the group is more likely to see predators

D more time with its head raised but the group is less likely to see predators.

Drawing Conclusions

1. D
2. C
3. D
4. A
5. A
6. B
7. C
8. B
9. A
10. A
11. D
12. A
13. B
14. C
15. B