

Coombe Wood Year 12 Bridging Work 2026/27



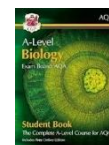
SUBJECT: Biology

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We recommend you purchase the following textbook for this subject area:

CGP A level Biology Exam board AQA, student book, the complete A level course for AQA (years 1&2)



All bridging work must be completed by 25/9 and forms part of your Pupil Passport at Coombe Wood Sixth Form.

Suggested reading	Suggested Podcasts	Useful Websites
The Gene by Siddhartha Mukherjee I Contain Multitudes by Ed Yong The Immortal Life of Henrietta Lacks Your Inner Fish by Neil Shubin Bad Science by Ben Goldacre The Selfish Gene by Richard Dawkins	Nature Podcast Science Vs The Naked Scientists This Week in Virology The Genetics Podcast The infinite monkey cage	Save my exams Physics and maths tutor Biology A level tutor Seneca learning BBC Bitesize A level AQA AQA Biology

BRIDGING TASKS

1, Research

Research how a diet high in saturated lipids leads to atheroma formation and how this impacts the cardiac output.

Watch and summarise the amoeba sisters videos on protein synthesis, transcription and translation.

2. Data Analysis

Mean mode median and scatter graphs

A student investigated an area of moorland where succession was occurring. The student used quadrats to measure the area covered by; different plant species, bare ground and surface water.

They did this every 10 metres along a line transect. The student also recorded the depth of soil at each quadrat. Their results are shown in the table.

	Area covered in each quadrat A to E in cm ²				
	A	B	C	D	E
Bog moss	55	40	10	–	–
Bell heather	–	–	–	15	10
'Sundew	10	5	–	–	–
Ling	–	–	–	15	20
Bilberry	–	–	–	15	25
Heath grass	–	–	30	10	5
Soft rush	–	30	20	5	5
Sheep's fescue	–	–	25	35	30
Bare ground	20	15	10	5	5
Surface water	15	10	5	–	–
Soil depth / cm	3.2	4.7	8.2	11.5	14.8

Calculate:

1. Calculate the mode area of soft rush in the sample.
2. Calculate the mean soil depth of the area of moorland sampled.
3. Calculate the median amount of bare ground in the sample.

Using the data in the table plot a **scatter graph** of the soil depth against the area covered by bare ground, soft rush and bog moss (use different colours or markers for each).

A patient with a leaking heart valve may have the valve replaced. A study compared two different types of replacement heart valve:

- mechanical valves
- biological valves from pigs.

Table 4

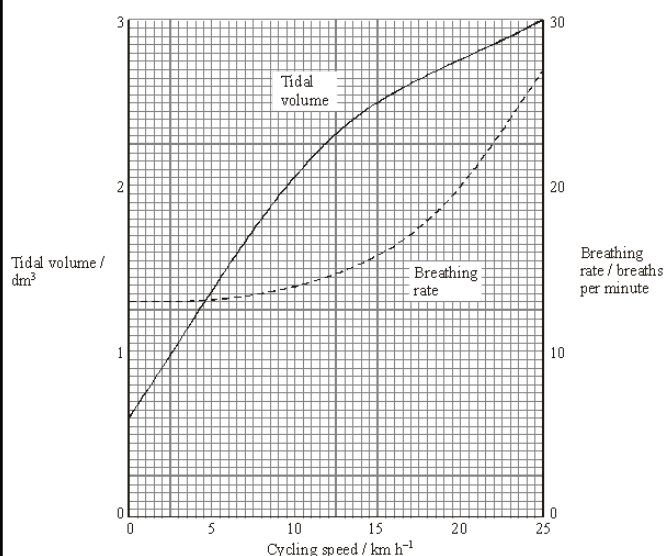
	Type of replacement heart valve	
	Mechanical	Biological
Number of patients given the valve	2852	1754
Number of patients who died from heart-related problems after valve replacement	180	178
Percentage of patients alive after 5 years	91	89
Percentage of patients needing a second valve replacement within 6 years	2.2	5.2
Percentage of patients who had a blood clot on the brain after surgery	5.8	0.1

The data used in the study was collected from female patients aged 50–69. **Table 4** shows the data

1. Give **one** conclusion about the death of patients from heart-related problems after a valve replacement. Include calculations to support your answer.
2. Evaluate the use of mechanical replacement heart valves and biological replacement heart valves. Use information from **Table 4**.

The volume of air breathed in and out of the lungs during each breath is called the tidal volume.

The breathing rate and tidal volume were measured for a cyclist pedalling at different speeds. The graph shows the results



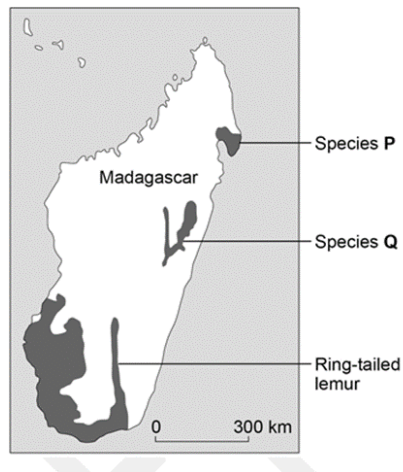
1. State the tidal volume when the cycling speed was 17 km h⁻¹.
2. State the breathing rate when the cycling speed was 8 km h⁻¹.
3. Calculate the change in breathing rate when the cyclist speed changed from 10 to 20 km h⁻¹. Express this as a percentage.
4. State the speed at which the breathing rate starts to increase.
5. The tidal volume increased linearly with the cycling speed up to about 10 km h⁻¹. Calculate the increase in volume for each increase in speed of 1 km h⁻¹.

3. Extended Writing

This is an 'open book' activity, meaning you can use notes/ resources to help you.

Before attempting the question below, you might want to remind yourself of the work you did on the following topics at GCSE (using notes/ textbooks/ revision guides etc):

- the theory of evolution
- the role of mutation and natural selection



Lemurs are only found on the island of Madagascar. Madagascar is off the coast of Africa. Scientists think that ancestors of modern lemurs evolved in Africa and reached Madagascar about 50-60 million years ago.

Today there are many species of lemur living on Madagascar

Figure 1 shows the distribution of three species of lemur on Madagascar.

Describe how the ancestors of modern lemurs may have evolved into the three different species shown on the map (species P, species Q and ring tail lemurs)

MATHS SPECIFIC QUESTIONS (IF APPLICABLE IN YOUR SUBJECT)

Re-write the following.

1. 0.00224 metres in millimetres
2. 104 micrograms in grams
3. 6.2 kilometres in metres
4. 10 micrograms in nanograms
5. 70 decilitres in litres
6. 10 cm^3 in litres

A student has a bacterial culture with a concentration of **1,000,000 cells per cm^3** .

They perform a series of **1:10 dilutions** by transferring **1 cm^3** of solution into **9 cm^3** of sterile water each time.

What is the concentration of bacteria after:

- a) The first dilution?
- b) The second dilution?
- c) The third dilution?