FIND YOUR FEET TASK

A LEVEL BIOLOGY:

TASKS

Complete the GCSE topic Checklist worksheet.

Organise your notes for each GCSE topic in an A4 lever arch folder with dividers.

Complete the Maths Skills Worksheet.

Complete the Fundamentals of Biology Worksheet (this worksheet is included below)

Complete the Khan Academy Activities on the worksheet.

RESEARCH

Careers in Biology

RECOMMENDED READING

A Level Biology A for OCR Student Book (Ann Fullick, Jo Locke, and Paul Bircher) (ISBN 978 -0-19-835192-4).
A-Level Biology for OCR A Student Book Bundle: Year 1 & 2 (https://www.cgpbooks.co.uk).
Essential Maths Skills for A-level Biology CGP Book

WEBSITES AND ONLINE LEARNING MATERIALS

https://www.ocr.org.uk/qualifications/as-and-a-level/biology-a-h020-h420-from-2015/
https://www.ocr.org.uk/qualifications/as-and-a-level/biology-a-h020-h420-from-2015/specification-at-a-glance/

To help you complete the Preparation Tasks, use the following websites:
https://www.bbc.co.uk/bitesize/subjects/z9ddmp3
Khan Academy

CONTACT

For any questions about your Find Your Feet task, please e-mail:

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Cells

All life on Earth exists as cells. These have basic features in common.

Activity 5	
Complete the table.	
Structure	Function
Cell-surface membrane	
Chloroplast	
Cell vacuole	
Mitochondria	
Nucleus	
Cell wall	
Chromosomes	
Ribosomes	

Draw the structure of a plant cell and an animal cell.
On each cell, add labels showing each of the structures in the table, if they exist.

Photosynthesis and respiration

Two of the most important reactions that take place in living things are photosynthesis and respiration. They both involve transfer of energy.

Activity 6

Complete the table.

	Photosynthesis	Aerobic respiration
Which organisms carry out this process?		
Where in the organisms does the process take place?		
Energy store at the beginning of the process	Sun	
Energy store at the end of the process		In cells
Reactants needed for the process		
Products of the process		
Overall word equation		
Balanced symbol equation for the overall process		

Which of the answers for aerobic respiration would be different for anaerobic respiration? Add these answers to the table in a different colour.

Principles of moving across boundaries

In biology, many processes involve moving substances across boundaries.

Activity 7

Match the examples to the principle(s) involved. For each, give a brief description of why it is relevant.

Osmosis	Examples
Diffusion	Drinking a sports drink after exercise
Active transport	Gas exchange in the lungs
Changing surface area or length	Absorbing nutrients from food into the body
	Moving ions into cells
	The effect of salt on slugs
	Penguins huddling together to keep warm
	Potato pieces get heavier when put in pure water
	Potato pieces get lighter when put in very salty water
	Cacti do not have thin, large leaves

Genetic inheritance

Activity 8

Huntington's disease is an example of a disease where the mutation causing the disease is dominant.

h: normal (recessive)

H: mutation (dominant)

		Paternal alleles	
		H	h
Maternal alleles	h		
	h		

Cystic fibrosis is an example of a disease where the mutation causing the disease is recessive.

F: normal (recessive)

f: mutation (dominant)

		Paternal alleles	
		F	f
Maternal alleles	F		
	f		

For each of the Punnett squares:

1. Complete the diagrams to show the alleles for each child.

2. State which parent and child is:

- healthy
- has the disease
- a carrier.

Activity 8 (continued)

Each of the following statements is false. Re-write each one so that it becomes true.

1. The first Punnett square shows that one in every four children from this couple will have Huntington's disease.

2. The second Punnett square shows that there is a one in three chance that a child born to this couple will have cystic fibrosis.

3. All children of the second couple will either be carriers or suffer from cystic fibrosis.

4. The percentage of children who are sufferers on the diagram is the same as the percentage of children each couple will have who are sufferers.

5. Having one child who is born with cystic fibrosis means that the next three children will not have the disease.

6. A 50:50 chance is the same as a 0.25 probability.

Analysing data

Biological investigations often result in large amounts of data being collected. It is important to be able to analyse this data carefully in order to pick out trends.

Activity 9: Mean, media, mode and scatter graphs

A student investigated an area of moorland where succession was occurring. She used quadrats to measure the area covered by different plant species, bare ground and surface water every 10 metres along a transect. She also recorded the depth of soil at each quadrat. Her 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

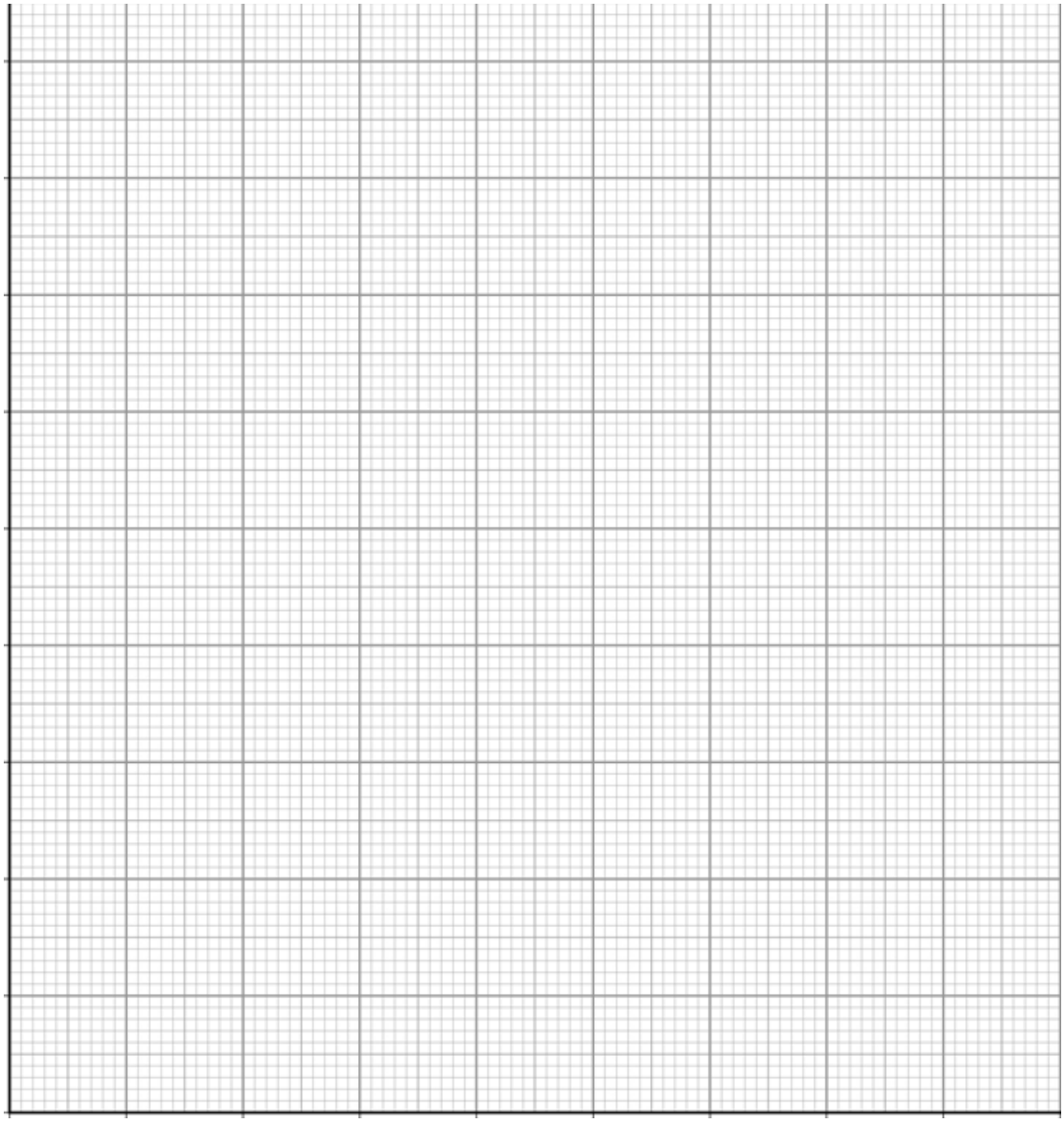
Bare ground	20	15	10	5	5
Surface water	15	10	5	-	-
Soil depth/cm	3.2	4.7	8.2	11.5	14.8

– indicates zero cover. Calculate:

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

Activity 9: Mean, media, mode and scatter graphs (continued)

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



Activity 9: Mean, media, mode and scatter graphs (continued)

4. What conclusions does your graph suggest?

5. How confident are you in these conclusions?

Activity 10: Analysing tables

Lung cancer, chronic bronchitis and coronary heart disease (CHD) are associated with smoking. Tables 1 and 2 give the total numbers of deaths from these diseases in the UK in 1974.

Table 1 Men

Age/years	Number of deaths (in thousands)		
	lung cancer	chronic bronchitis	coronary heart disease

35-64	11.5	4.2	31.7
65-74	12.6	8.5	33.3
75+	5.8	8.1	29.1
Total (35-75+)	29.9	20.8	94.1

Table 2 Women

Age/years	Number of deaths (in thousands)		
	lung cancer	chronic bronchitis	coronary heart disease
35-64	3.2	1.3	8.4
65-74	2.6	1.9	18.2
75+	1.8	3.5	42.3
Total (35-75+)	7.6	6.7	68.9

Activity 10: Analysing tables (continued)

1. Of the men who died aged 35-64 from one of these three causes, what percentage of them died of lung cancer?

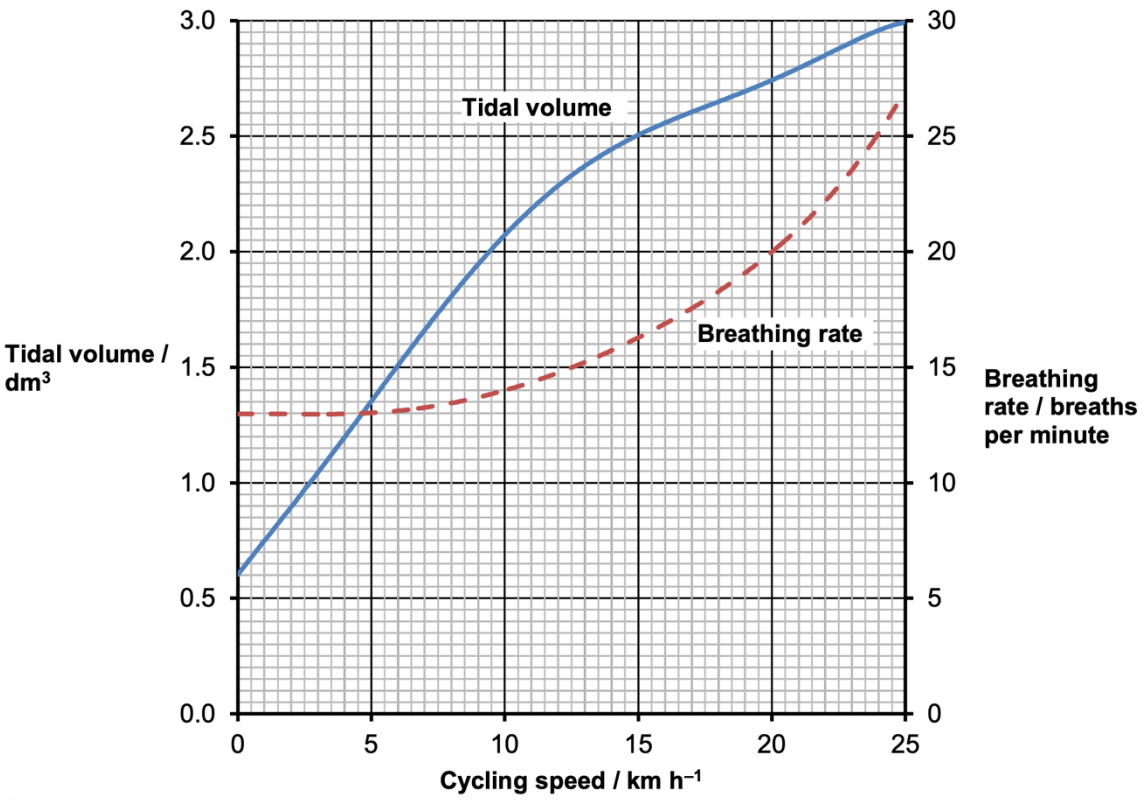
2. What percentage of deaths from chronic bronchitis in women happened to women aged 65-74?

3. Deaths from lung cancer drop as people get older. Is there a bigger percentage difference for men or women from 35-64 to 75+?

4. What fraction of coronary heart disease deaths of men over 34 are in the 75+ bracket? What about for women?

Activity 11: Analysing complex graphs

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 pedaling at different speeds. The graph shows the results.



1. What was the tidal volume when the cycling speed was 17 km h^{-1}?
2. What was the breathing rate when the cycling speed was 8 km h^{-1}?
3. What was the change in breathing rate when the cyclist changed from 10 to 20 km h^{-1} ? Express this as a percentage.
4. At what speed did the breathing rate start to increase?
5. The tidal volume increased linearly with cycling speed up to about 10 km h^{-1}. Calculate the increase in volume for each increase in speed of 1 km h^{-1}.
6. For this initial linear section, what is the equation of the tidal volume line?

   Hint: use y=mx + c