

AQA Combined Science GCSE Trilogy

Biology Paper 1 AO1 Questions

Cells

1. Name the key parts of an animal cell
2. Name the key parts of a plant cell
3. What are the differences between prokaryotic and eukaryotic cells?
4. What is a plasmid?
5. Describe the functions of the key parts of an animal cell.
6. Describe the functions of the key parts of a plant cell.
7. Which part do plant, algal and some bacterial cells have that animal cells do not?
8. What are cell walls made from?
9. How is a sperm cell adapted to its function?
10. How is a nerve cell adapted to its function?
11. How is a muscle cell adapted to its function?
12. How is a root hair cell adapted to its function?
13. What is cell differentiation?
14. What is the difference between magnification and resolution?
15. Why is an electron microscope able to see smaller details of cells than a light microscope?
16. What does the cell nucleus contain?
17. Describe the stages of cell division in the cell cycle.
18. What is a stem cell?
19. Where can human stem cells be harvested from?
20. What is meristem tissue in plants?
21. Which conditions might stem cell treatment be able to help?
22. What are some common objections to the use of stem cells in medical treatments?
23. What is diffusion?
24. Which substances move in and out of cells by diffusion?
25. How does a concentration gradient affect the rate of diffusion?
26. How does the temperature affect the rate of diffusion?
27. How does the surface area of the membrane affect the rate of diffusion?
28. How are the alveoli in the lungs adapted to maximise the rate of diffusion?
29. What is osmosis?
30. What is active transport?
31. Where does active transport occur in the body?
32. Which substances are moved by active transport in the body?
33. Where does active transport occur in plants?
34. Which substances are moved by active transport in plants?

Organisation

1. What is a cell?
2. What is a tissue?
3. What is an organ?
4. What is an organ system?
5. What is an enzyme?
6. Name the major organs of the human digestive system.
7. What is the 'lock and key' model of enzyme action?

8. Where in the body are amylase, proteases and lipases produced?
9. What is the job of enzymes in digestion?
10. What do carbohydrases act on and what are the products of their action?
11. What do proteases act on and what are the products of their action?
12. What do lipases act on and what are the products of their action?
13. What are the products of digestion used for in the body?
14. What is bile?
15. Where is bile made and where is it stored?
16. What is the job of bile in digestion?
17. What does Benedict's solution test for?
18. What can Iodine be used to test for?
19. What does Biuret reagent test for?
20. How does pH affect enzyme function?
21. How many chambers does the heart have and what are they called?
22. What are the main blood vessels that run to and from the heart?
23. Why does the heart have a double pump system?
24. How are the lungs adapted for gaseous exchange?
25. What are alveoli?
26. How is resting heart rate controlled?
27. How can irregular heart rates be corrected?
28. What are the 3 types of blood vessel?
29. What are the differences between each of the 3 types of blood vessel?
30. What are the components of the blood?
31. What are the functions of the different components of the blood?
32. What causes coronary heart disease?
33. How can coronary heart disease be treated?
34. How can heart failure be treated?
35. What is health?
36. What is disease?
37. What causes communicable disease?
38. Which lifestyle risk factors may lead to a higher chance of developing cancer?
39. How does alcohol affect the body?
40. How does smoking affect the lungs?
41. What is a carcinogen? Give examples.
42. What is cancer?
43. What is the difference between a benign and a malignant tumour?
44. What are the different tissues in a leaf?
45. What is the function of the xylem?
46. What is xylem tissue made from?
47. What is the function of the phloem?
48. What is phloem tissue made from?
49. What is translocation?
50. What is transpiration?
51. Which factors affect the rate of transpiration?
52. What are stomata?
53. What is the function of the stomata?

Infection & Response

1. What is a pathogen?

2. How can pathogens be spread?
3. How do bacteria make us ill?
4. How do viruses make us ill?
5. What is measles?
6. How is measles spread?
7. What are the symptoms of HIV?
8. How is HIV spread?
9. What is TMV?
10. What are the symptoms of TMV?
11. What is salmonella?
12. How is salmonella spread?
13. What are the symptoms of salmonella?
14. What is gonorrhoea?
15. How is gonorrhoea spread?
16. What are the symptoms of gonorrhoea?
17. How can gonorrhoea be treated?
18. What is rose black spot?
19. What are the symptoms of rose black spot?
20. How can rose black spot be treated?
21. What causes malaria?
22. How can malaria be spread?
23. Name the non-specific defence systems of the human body against pathogens.
24. What is the immune system response when a pathogen enters the body?
25. What are the 3 ways white blood cells help defend against pathogens?
26. What is contained in a vaccine?
27. How does a vaccine protect against future infection?
28. What is an antibiotic?
29. Give an example of an antibiotic.
30. Can antibiotics prevent measles?
31. Where were our drugs traditionally extracted from?
32. Where does the heart drug digitalis originate from?
33. Where does the painkiller aspirin originate from?
34. Who discovered penicillin?
35. How are modern drugs produced?
36. What are new drugs tested for?
37. What are the stages of testing for a new drug?
38. What is a randomised double-blind placebo controlled trial?
39. Why are randomised double-blind placebo controlled trials used?

Bioenergetics

1. What is photosynthesis?
2. What is the word equation for photosynthesis?
3. What is the balanced symbol equation for photosynthesis?
4. Is photosynthesis an endothermic or exothermic reaction?
5. What does a plant use the glucose from photosynthesis for?
6. How does a plant store excess glucose?
7. What else does a plant need in addition to glucose to make proteins?
8. What is respiration?
9. What is the word equation for aerobic respiration?

10. What is the balanced symbol equation for aerobic respiration?
11. What are the differences between aerobic and anaerobic respiration?
12. Why do organisms need energy?
13. What is the word equation for anaerobic respiration in muscles?
14. What are the productions of anaerobic respiration in plant and yeast cells?
15. How do we use the anaerobic respiration of yeast in the food and drink industry?
16. How does the heart rate change during exercise?
17. How does the breathing rate change during exercise?
18. Why do these changes to heart and breathing rates happen when we exercise?
19. What is oxygen debt?
20. What is metabolism?
21. Which processes occur in the cells?

Practical Knowledge Needed:

- How do you use a light microscope?
- What can a light microscope be used for?
- How do you calculate the magnification of a microscope?
- How could you investigate the effect of concentration of sugar solution on the mass of plant tissue left in the solution?
- How could you investigate a range of foods to see which contain fats, proteins, sugars and starch?
- How could you investigate the effect of changing pH on the rate of reaction of amylase?
- How can you investigate the effect of exercise on heart rate?
- How could you investigate the effect of changing temperature on the rate of photosynthesis?

Maths Skills Needed: 1b, 2a, 2h, 1d, 3a, 1a, 3b, 1c, 5c, 4a, 4b, 4c, 4d, 2c, 2g

- Can you put the prefixes nano, milli, centi, deci and micro in size order?
- Can you calculate magnification using the equation $\text{magnification} = \frac{\text{size of image}}{\text{size of real object}}$?
- Can you calculate the surface area of a 3cm x 3cm x 3cm cube?
- Can you calculate the volume of a 3cm x 3cm x 3cm cube?
- Can you work out the surface area : volume ratio of a 3cm x 3cm x 3cm cube?
- Can you work out 80% of 1.5?
- Can you calculate the percentage increase in the mass of a plant that goes from 10.5g to 14.2g?
- Can you calculate the percentage decrease in the volume of water changing from 130ml to 89ml?
- Can you plot a line graph?
- Can you plot a bar graph?
- Can you draw a line of best fit?
- Can you draw a curve of best fit?
- Can you construct a frequency table?
- Can you use a scatter diagram to spot a correlation between two variables?
- Can you calculate a mean?
- What is the mean of the following 5 values: 0.4, 0.7, 0.5, 0.5, 0.6