

# Q&A List - GCSE Combined Science - Biology Paper 1

## Part 1a - Cells

No.	Question	Answer
1	State the function of the nucleus.	Controls all activities of the cell, contains DNA
2	State the function of the cytoplasm.	Where most chemical reactions take place
3	State the function of the cell membrane.	Controls what substances go in and out of the cell
4	State the function of the mitochondria.	Where aerobic respiration takes place, releases energy for the cell to use
5	State the function of the ribosomes.	Site of protein synthesis (where proteins are made)
6	What substance makes up plants' cell walls?	Cellulose
7	State the function of the cell wall.	Strengthens the cell, provide support
8	State the function of the chloroplasts	Contain chlorophyll, absorb light to do photosynthesis
9	State the function of the permanent vacuole.	Stores sap, helps to keep plant cells rigid to provide support
10	State three differences between animal and plant cells.	Plant cells have chloroplasts, permanent vacuole and cellulose cell wall.
11	State a key difference between prokaryotes and eukaryotes.	Prokaryotes do not have a nucleus. Eukaryotes do.
12	State one organism that is prokaryotic.	Bacteria
13	Prokaryotes have a cell wall. True or false?	TRUE
14	Some bacteria have an extra layer on top of their cell walls. What is the name of that layer?	Slime capsule
15	Where does the genetic material of a prokaryotic cell exist?	Cytoplasm
16	What is a difference between prokaryotic and eukaryotic DNA?	Prokaryotic DNA is circular; Eukaryotic DNA is linear
17	What is the name of extra small DNA rings found in some prokaryotes?	Plasmid
18	What is the function of flagella?	To allow the cell to swim and move around
19	State a difference between animal cells and bacteria.	A: No cell wall and plasmid, linear DNA; B: Cell wall and plasmid, circular DNA
20	State a similarity between plant cells and bacterial cells.	Both have cell walls (but different material)
21	How do we calculate the total magnification of a microscope?	Eye piece lens x Objective lens magnifying power

22	State the equation that links magnification, image size and actual size.	Image Size = Actual Size x Magnification
23	Which type of microscope has higher magnification and resolving power - Light or electron?	Electron microscopes
24	Explain how electron microscopy has increased understanding of organelles.	Electron microscopes have much greater magnification and resolution. Organelles can be seen with EM.
25	Calculate the magnification of a light microscope.	Magnification= Image size ÷ object size
26	Rearrange the equation to calculate image size or magnification.	Image size= magnification X object size Object size= Image size ÷ magnification
27	Convert 5mm to $\mu\text{m}$ .	5000 $\mu\text{m}$
28	Which objective lens should we start using?	Low power objective lens
29	Which focus knob should be used during low and medium power magnification?	Coarse focus knob
30	Which focus knob should be used during high power magnification?	Fine focus knob
31	Why must we not use the coarse focus knob during high power magnification?	It moves the stage by too much, may break the lens and the slide

## Part 1b - Cells

No.	Question	Answer
1	Define 'diffusion'.	Net movement of particles from an area of high to low concentration (down concentration gradient)
2	What does it mean by 'net movement'?	Overall movement
3	State three factors that affect the rate of diffusion.	Concentration gradient Temperature Surface area
4	How does concentration difference affect the rate of diffusion?	Higher concentration difference = faster diffusion
5	Explain why a higher temperature results in faster diffusion.	More kinetic energy, particles move around more
6	Name a useful substance that diffuses into our cells	Oxygen, glucose
7	Name a waste substance that diffuses out of our cells	Carbon dioxide, urea
8	Name a structure in the body that is adapted to increase diffusion rate.	Alveoli, villi
9	State the relationship between size and surface area to volume ratio.	The bigger the size, the smaller the SA:V

10	Define 'osmosis'.	Net movement of water molecules down the water concentration gradient through a partially permeable membrane
11	Define 'dilute'.	A solution with a high water concentration, but low solute concentration
12	Define 'concentrated'.	A solution with a low water concentration, but high solute concentration
13	What are partially permeable membranes?	Membranes that only allow some types of substances to pass through
14	Why does the potato skin need to be removed before putting the potato cylinders into the solutions?	Skin is impermeable
15	How do we calculate % change in mass?	$(\text{final mass} - \text{initial mass}) / \text{initial mass} \times 100$
16	Define 'active transport'.	Movement of particles against the concentration gradient (low to high) using energy
17	State one adaptations cells may have if they need to carry out active transport.	Lots of mitochondria for respiration for energy
18	Give an example of active transport in plants.	Root hair cells absorb mineral ions effectively in soil
19	Give an example of active transport in animals.	Cells in gut lining to absorb glucose effectively
20	How does active transport differ from diffusion and osmosis?	Active transport uses energy, Diffusion and Osmosis do not
21	State two differences between diffusion and osmosis.	Diffusion: Any particles, does not need a membrane; Osmosis: Water specific, needs partially permeable membrane
22	Describe three adaptations of exchange surfaces.	Large surface area, Thin membrane/surface, Good blood supply

## Part 2a - Organisation - Digestion

No.	Question	Answer
1	Put the following in order of size: tissue, cell, organ system, organ, organism	Cell → Tissue → Organ → Organ System → Organism
2	Name the tube that carries food from the mouth to the stomach.	Oesophagus
3	State the function of the stomach.	Releases digestive enzymes to digest food
4	State the function of the liver in the digestive system.	Produces bile
5	State the function of the small intestine.	Digest food and absorb nutrients from digested food
6	State the function of the large intestine.	Absorb water from digested food
7	State the function of the pancreas.	Produces/Releases digestive enzymes

8	State the function of the gall bladder.	Store bile before release into small intestine
9	What do you add to test for starch?	Iodine
10	If you add biuret reagent, what are you testing for?	Protein
11	What colour is a positive test for starch?	Blue/black
12	What do you add to test for sugars?	Benedict's solution
13	What do you add to test for lipids?	Ethanol
14	What is a positive test for lipids?	Milky white
15	What is a positive test for protein?	Purple
16	What is an enzyme?	Molecules that speed up a chemical reaction without being changed by the reaction
17	Name the enzyme that breaks down carbohydrates.	Carbohydrase
18	Name the enzyme that breaks down proteins.	Protease
19	Name the enzyme that breaks down lipids.	Lipase
20	What are carbohydrates broken down in to?	Simple sugars
21	What are proteins broken down in to?	Amino acids
22	What are lipids broken down in to?	Fatty acids Glycerol
23	What is it called when the shape of the enzyme changes and no longer works?	Denatured
24	Why do larger molecules need to be broken down in to smaller ones?	So they can be absorbed in to the blood

## Part 2b - Organisation - The Heart

No.	Question	Answer
1	Which chamber of the heart has a thick muscular wall?	Left ventricle
2	Where are the pacemaker cells found?	Right atrium
3	Which blood vessels contain valves?	Veins
4	Which chamber of the heart pumps blood to the lungs for gas exchange?	Right ventricle

5	What is the role of valves?	Ensure blood flows in one direction (prevent backflow)
6	Name the artery that carries blood out of the heart towards the body.	Left ventricle
7	Which type of vessel returns blood to the heart?	Veins
8	Which type of blood vessel is only one cell thick?	Capillaries
9	Name 3 organs found in plants.	Leaf Stem Root
10	Name the pores found on the bottom surface of leaves.	Stomata
11	Which tube in plants carries water?	Xylem
12	Where does gas exchange take place?	Alveoli
13	How are the alveoli adapted for efficient gas exchange?	One cell thick Good blood supply Large surface area
14	What is the role of the red blood cells?	Carry oxygen around the body
15	What is the purpose of platelets?	Clot the blood
16	What is the role of stomata and guard cells?	Control gas exchange and water loss
17	What does phloem tissue transport?	Sugars
18	Name the cells that control the opening and closing of stomata.	Guard cells

## Part 2b - Organisation - Non-Communicable Diseases

No.	Question	Answer
1	Define 'benign tumour'.	Growth of abnormal cells contained in one area, don't invade other tissues
2	Define 'malignant tumour'.	Tumours that invade other tissues and can spread to other parts of the body through blood to form secondary tumours
3	Which tumour leads to cancer - benign or malignant?	Malignant
4	Name a risk factor of developing cancer.	Smoking Obesity UV exposure genetic factors
5	Name a risk factor for type 2 diabetes.	Obesity Unbalance diet (high sugar diet) Lack of exercise
6	Name a method to unblock a coronary artery in the heart.	Stent

7	Name a drug that reduces blood cholesterol levels.	Statins
8	What can be used to replace a damaged heart valve?	Biological or mechanical valves
9	What causes arteries to narrow when somebody is suffering from coronary heart disease?	Build-up of fatty deposits in the coronary arteries
10	What is considered a risk factor for coronary heart disease?	Obesity Lack of exercise High fat diet
11	What are potential risks of having stents fitted?	Infection from surgery
12	How can survival rates of cancer be improved?	improved treatment / drugs earlier diagnosis more <b>cancer</b> screenings improved patient knowledge of risk factors

### Part 3 - Infection & Responses

No.	Question	Answer
1	What are pathogens?	Microorganisms that cause diseases
2	How can pathogens be spread?	Air Direct contact Water
3	Name the four types of pathogens	Bacteria Virus Protist Fungi
4	What is a placebo?	A fake drug (a tablet that doesn't contain the drug)
5	How can HIV be spread?	Sexual contact Sharing needles
6	How is measles spread?	Air droplets that contain the virus
7	What type of infection can be treated with antibiotics?	Bacterial
8	Where can Salmonella bacteria be found?	Raw chicken
9	Which pathogen causes gonorrhoea?	Bacteria
10	Which pathogen causes measles?	Virus
11	How can bacterial diseases be treated?	Antibiotics
12	How is malaria spread?	Mosquitoes
13	How can the spread of malaria be reduced?	Use mosquito nets Use insecticides Remove standing water

14	Give a symptom of gonorrhoea	Yellow/green discharge from penis/vagina Pain on urination
15	Which plant did the heart drug digitalis originated from?	Foxgloves
16	Which drug originated from willow?	Aspirin
17	How does tobacco mosaic virus (TMV) affect the plants?	Destroy chloroplasts, so reduce photosynthesis
18	What living materials are used in preclinical testing?	Human cells Mice, rabbits or pigs
19	What is a double-blind trial?	Neither the patients or the doctors know what they are being given
20	How does the body prevent pathogens from entering the body?	Skin Stomach acid Cilia / mucus
21	What 3 things do white blood cells do to fight off invading pathogens?	Produce antibodies Produce antitoxins Engulf pathogens
22	How can antibiotic resistance be prevented?	Take the full course of antibiotics Don't over use antibiotics Only prescribe for bacterial illnesses

## Part 4 - Bioenergetics

No.	Question	Answer
1	Is photosynthesis endothermic or exothermic?	Endothermic
2	State the equation for photosynthesis.	carbon dioxide + water → glucose + oxygen
3	Where does photosynthesis occur in the cell?	Chloroplast
4	Name the pigment in chloroplasts that absorbs light.	Chlorophyll
5	State an adaptation of the leaf for efficient photosynthesis.	Broad leaves/Thin/Have chlorophyll/Air spaces/Guard cells to regulate stomata opening
6	How does higher light intensity affect the rate of photosynthesis?	Increase
7	Apart from light and carbon dioxide concentration, name one other limiting factor of photosynthetic rate.	Temperature/Chlorophyll levels
8	Why does the rate of photosynthesis decrease at higher temperatures?	Enzymes become denatured
9	Name one use of glucose in plants.	Respiration/Make and strengthen cellulose cell wall/Make starch for storage/Make lipids as energy store
10	Why do plants need nitrates for good growth?	Make proteins

11	Where does carbon dioxide enter a plant?	Through stomata in the leaves
12	Where does water enter a plant?	The roots
13	Which tubes carry water up through the plant to the leaves?	xylem
14	What is the dependent variable when measuring the rate of photosynthesis in the required practical?	Number of bubbles of oxygen produced per minute.
15	State the word equation for aerobic respiration.	Glucose + Oxygen → Carbon dioxide + Water
16	Is respiration endothermic or exothermic?	Exothermic
17	Where does aerobic respiration occur in the cell?	Mitochondria
18	Give one importance of respiration.	Metabolic reactions (e.g. Building molecules) Muscle contraction (movement) Maintaining body temperature
19	State one response of the body to exercise.	Increase heart rate/breathing rate/Glycogen converted to glucose/Increase blood flow to muscles
20	What is anaerobic respiration?	Breakdown of glucose to release small amount of energy without the use of oxygen
21	Name the toxic substance produced by anaerobic respiration.	Lactic acid
22	Define 'oxygen debt'.	Amount of oxygen needed to break down lactic acid
23	What do plants make in anaerobic respiration?	Ethanol and carbon dioxide
24	Give one use of yeast doing anaerobic respiration.	Making bread and alcohol
25	Give one example of a metabolic reaction in cells.	Convert glucose to glycogen, starch or cellulose. Make/breakdown molecules Photosynthesis or respiration



## TEST YOURSELF - Q&A List - GCSE Combined Science - Biology Paper 1

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2	State the function of the cytoplasm.	
3	State the function of the cell membrane.	
4	State the function of the mitochondria.	
5	State the function of the ribosomes.	
6	What substance makes up plants' cell walls?	
7	State the function of the cell wall.	
8	State the function of the chloroplasts	
9	State the function of the permanent vacuole.	
10	State three differences between animal and plant cells.	
11	State a key difference between prokaryotes and eukaryotes.	
12	State one organism that is prokaryotic.	
13	Prokaryotes have a cell wall. True or false?	
14	Some bacteria have an extra layer on top of their cell walls. What is the name of that layer?	
15	Where does the genetic material of a prokaryotic cell exist?	
16	What is a difference between prokaryotic and eukaryotic DNA?	
17	What is the name of extra small DNA rings found in some prokaryotes?	
18	What is the function of flagella?	
19	State a difference between animal cells and bacteria.	
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21	How do we calculate the total magnification of a microscope?	

22	State the equation that links magnification, image size and actual size.	
23	Which type of microscope has higher magnification and resolving power - Light or electron?	
24	Explain how electron microscopy has increased understanding of organelles.	
25	Calculate the magnification of a light microscope.	
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27	Convert 5mm to $\mu\text{m}$ .	
28	Which objective lens should we start using?	
29	Which focus knob should be used during low and medium power magnification?	
30	Which focus knob should be used during high power magnification?	
31	Why must we not use the coarse focus knob during high power magnification?	

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2	What does it mean by 'net movement'?	
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6	Name a useful substance that diffuses into our cells	
7	Name a waste substance that diffuses out of our cells	
8	Name a structure in the body that is adapted to increase diffusion rate.	
9	State the relationship between size and surface area to volume ratio.	

10	Define 'osmosis'.	
11	Define 'dilute'.	
12	Define 'concentrated'.	
13	What are partially permeable membranes?	
14	Why does the potato skin need to be removed before putting the potato cylinders into the solutions?	
15	How do we calculate % change in mass?	
16	Define 'active transport'.	
17	State one adaptations cells may have if they need to carry out active transport.	
18	Give an example of active transport in plants.	
19	Give an example of active transport in animals.	
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21	State two differences between diffusion and osmosis.	
22	Describe three adaptations of exchange surfaces.	

## Test YOURSELF - Part 2a - Organisation - Digestion

No.	Question	Answer
1	Put the following in order of size: tissue, cell, organ system, organ, organism	
2	Name the tube that carries food from the mouth to the stomach.	
3	State the function of the stomach.	
4	State the function of the liver in the digestive system.	
5	State the function of the small intestine.	
6	State the function of the large intestine.	
7	State the function of the pancreas.	
8	State the function of the gall bladder.	

9	What do you add to test for starch?	
10	If you add biuret reagent, what are you testing for?	
11	What colour is a positive test for starch?	
12	What do you add to test for sugars?	
13	What do you add to test for lipids?	
14	What is a positive test for lipids?	
15	What is a positive test for protein?	
16	What is an enzyme?	
17	Name the enzyme that breaks down carbohydrates.	
18	Name the enzyme that breaks down proteins.	
19	Name the enzyme that breaks down lipids.	
20	What are carbohydrates broken down in to?	
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3	Which blood vessels contain valves?	
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7	Which type of vessel returns blood to the heart?	
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9	Name 3 organs found in plants.	
10	Name the pores found on the bottom surface of leaves.	
11	Which tube in plants carries water?	
12	Where does gas exchange take place?	
13	How are the alveoli adapted for efficient gas exchange?	
14	What is the role of the red blood cells?	
15	What is the purpose of platelets?	
16	What is the role of stomata and guard cells?	
17	What does phloem tissue transport?	
18	Name the cells that control the opening and closing of stomata.	

### Test YOURSELF - Part 2b - Organisation - Non-Communicable Diseases

No.	Question	Answer
1	Define 'benign tumour'.	
2	Define 'malignant tumour'.	
3	Which tumour leads to cancer - benign or malignant?	
4	Name a risk factor of developing cancer.	
5	Name a risk factor for type 2 diabetes.	
6	Name a method to unblock a coronary artery in the heart.	
7	Name a drug that reduces blood cholesterol levels.	
8	What can be used to replace a damaged heart valve?	Biological or mechanical valves

9	What causes arteries to narrow when somebody is suffering from coronary heart disease?	
10	What is considered a risk factor for coronary heart disease?	
11	What are potential risks of having stents fitted?	
12	How can survival rates of cancer be improved?	

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3	Name the four types of pathogens	
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7	What type of infection can be treated with antibiotics?	
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11	How can bacterial diseases be treated?	
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17	How does tobacco mosaic virus (TMV) affect the plants?	
18	What living materials are used in preclinical testing?	
19	What is a double-blind trial?	
20	How does the body prevent pathogens from entering the body?	
21	What 3 things do white blood cells do to fight off invading pathogens?	
22	How can antibiotic resistance be prevented?	

## Test YOURSELF - Part 4 - Bioenergetics

No.	Question	Answer
1	Is photosynthesis endothermic or exothermic?	
2	State the equation for photosynthesis.	
3	Where does photosynthesis occur in the cell?	
4	Name the pigment in chloroplasts that absorbs light.	
5	State an adaptation of the leaf for efficient photosynthesis.	
6	How does higher light intensity affect the rate of photosynthesis?	
7	Apart from light and carbon dioxide concentration, name one other limiting factor of photosynthetic rate.	
8	Why does the rate of photosynthesis decrease at higher temperatures?	
9	Name one use of glucose in plants.	
10	Why do plants need nitrates for good growth?	
11	Where does carbon dioxide enter a plant?	
12	Where does water enter a plant?	
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