Buttershaw Business and Enterprise College

AQA Combined Science Trilogy Biology Paper 1 Foundation Key Recall Facts

Cell Biology, Organisation, Infection and Response and Bioenergetics

Exam Date – Tuesday 16th May

Name……

Group……

Teacher……

Cell Biology Recall Facts

1. Give 3 examples of eukaryotic cells	Animal, plant and yeast
2. Give one example of prokaryotic cells	Bacteria
3. In a cell, what is the role of the: a. Nucleus b. Cell membrane c. Cytoplasm d. Mitochondria e. Ribosomes	• Nucleus - Contains DNA, Controls the cell • Cell membrane - controls which substances move in and out of the cell • Cytoplasm - Where chemical reactions take place • Mitochondria - Where aerobic respiration takes place • Ribosomes – Where protein synthesis takes place
4. In a cell, what is the role of the: a. Chloroplasts (plants) b. Cell wall (plants, yeast and bacteria only) c. Permanent vacuole (plants)	• Chloroplasts – absorbs light for photosynthesis • Cell Wall – strengthens/supports plant cell • Vacuole – contains cell sap
5. What are the similarities between a eukaryotic and a prokaryotic cell?	Both have ribosomes, cell membrane, cytoplasm, and DNA
6. What are the main differences between a eukaryotic and a prokaryotic cell?	• Eukaryotic cells have a nucleus, prokaryotic cells do not. • Eukaryotic cells have mitochondria and chloroplasts, prokaryotic cells do not. • Eukaryotic cells are bigger. • Eukaryotic cells have bigger ribosomes. • Prokaryotic cells have plasmids, eukaryotic do not
7. What is the equation that links magnification, image size and real size?	$\text{magnification} = \frac{\text{image size}}{\text{real size}}$
8. How many micrometres in a millimetre?	1000
9. What is the function of a muscle cell?	Contract to allow movement
10. What is the function of a sperm cell?	To fertilise an ovum (egg)
11. How is the structure of a sperm cell related to its function?	• It has a tail to swim to the ovum to fertilise it • Contains lots of mitochondria to release energy from respiration for sperm to swim.
12. What is the function of a root hair cell?	Absorbs water and minerals from the soil.

13. Give 2 adaptations of a root hair cell	Large surface area for taking in more water. Mitochondria to provide energy for active transport of mineral ions.
14. Define unspecialised cells.	An undifferentiated cell
15. What is diffusion?	The movement of a substance from an area of high concentration to an area of low concentration, through a semi permeable membrane
16. Give 3 examples of diffusion in animals.	Movement of oxygen from the alveoli into the bloodstream. Movement of Carbon dioxide from the bloodstream into the alveoli. Movement of glucose into the cells for respiration
17. Give one example of diffusion in a plant.	Diffusion of carbon dioxide into the leaf through the stomata
18. Give 3 factors that affect diffusion in a living organism	Surface area Distance of diffusion pathway Concentration gradient
19. How are villi adapted for rapid diffusion?	Folded to give a large surface area. One cell thick so diffusion pathway is short Good blood supply to maintain concentration gradient
20. How are alveoli adapted for gas exchange?	Lots of them so large surface area One cell thick for short diffusion pathway Good blood supply to maintain concentration gradient
21. What is osmosis?	The movement of water from an area of high concentration to an area of low concentration
22. What is active transport?	The movement of a substance from an area of low concentration to an area of high concentration. This requires energy.

Organisation

1. What are cells?	The smallest unit of living organisms
2. What is a tissue?	A group of the same cells working together to carry out the same function
3. What is an organ?	A group of tissues working together to carry out a function, e.g heart, lungs, kidneys
4. What is organ system?	A group of organs working together to carry out a function. E.g digestive system, circulatory system,nervous system
5. Describe the function of the following organs of the digestive system. a) Mouth b) Salivary Glands c) Oesophagus d) Stomach e) Liver f) Gall bladder g) Pancreas h) Small Intestine i) Large Intestine	A)Mouth- mechanical digestion as the teeth break up the food. B)Addition of saliva to ease swallowing. Chemical digestion of starch by enzyme amylase c) Oesophagus- Tube leading from mouth to stomach. d) Stomach- Muscular bag that churns and mixes the food with acid and digestive juices containing protease enzyme e) Liver- produces bile f) Gall bladder- Stores bile g) Pancreas- produces the digestive enzymes, amylase, protease and lipase h) Small intestine- Has villi for reabsorption of digested nutrients. Where amylase, protease and lipase work. i) Large intestine- where water is reabsorbed
6. Why is the pH of the stomach 2?	To allow the enzyme protease to work. To destroy pathogens in the stomach
7. What is the function of bile?	Emulsifies fats and neutralises stomach acid
8. What are enzymes?	Biological catalysts. Made of protein
9. What is the function of the enzyme amylase?	Speed up chemical reactions, such as the digestion of food
10. What is the function of the enzyme lipase?	Speeds up the breakdown of fats/lipids into fatty acids and glycerol
11. What is the function of the enzyme protease?	Speeds up the breakdown of proteins into amino acids

12. Describe and explain what happens to the enzyme activity at very high temperatures or if the pH gets too high/low from the optimum	At high temperatures the active site of the enzyme changes shape/denatures. The enzyme will not work. High and low pH can also denature the enzyme
13. Describe the test for starch	Add iodine to the food. If starch is present the iodine will change from orange to black.
14. Describe the test for sugars (glucose)	Add benedicts to crushed food and a little water. Heat to over 80 degrees. If glucose is present the benedicvts will change from blue to green/orange/red
15. Describe the test for protein	Add Buiret's reagent to crushed food and a little water. If protein is present the buiret's will change from blue to lilac
16. Describe the test for fats	Add ethanol to the crushed food and a little water. If fats are present it will turn milky. Add sudan III to crushed food and a little water. If fats are present then there will be a red layer at the top of the water.
17. Name the 4 chambers of the heart.	Left and right atrium (at the top) Left and right ventricle (at the bottom
18. Why is the heart known as a double pump?	The left and right side of the heart are kept separate. The left side pumps blood to the body cells. At the same time the right side pumps blood to the lungs.
19. What is a coronary artery?	The artery that takes blood to the muscle cells of the heart
20. How does a heart attack occur?	The coronary artery becomes blocked and narrows, preventing oxygen from reaching the muscle cells of the heart so they cannot respire. The heart muscles stop contracting and the heart stops.

21. Name the 3 blood vessels in the body and state their function	Arteries, carry blood away from the heart Veins carry blood into the heart Capillaries carry blood to every cell of the body and are very tiny
22. Describe and explain the difference in the structure of arteries and veins	Arteries- Have thick, elastic, muscular walls. They have a fairly small lumen and carry blood at high pressure. Veins- Have walls that are thinner and contain very little elastic tissue or muscle. They have a larger lumen and carry blood at low pressure. They contain lots of valves. Capillaries are one cell thick for fast diffusion of substances. Only one blood cell at a time can fit through a cappilary
23. Name the 4 components of the blood and state their function	Red blood cells- carry oxygen White blood cells- defend the body against pathogens and disease Platelets- Banana shaped part cells that are used in blood clotting and forming scabs Plasma- Yellow liquid that carries glucose, nutrients, hormones, carbon dioxide
24. Why do we have valves in the heart?	To prevent the backflow of blood to where it has already been.
25. What is a stent? Give advantages and disadvantages of a stent	Stent- a mesh tube that is inserted into the coronary artery and inflated to open up the artery.

	Adv- Long lasting treatment for blocked arteries. Does not require drugs to be taken. Disadvantage- Requires surgery. Risk of infection. May need replacing.
26. What are statins? Give advantages and disadvantages of using statins	Medication used to lower cholesterol levels Advantages – cheap, easy to use, may help prevent other diseases Disadvantages – must be taken reliably, long term use, negative side effects, takes a while to work
27. What is the definition of cancer?	Uncontrolled cell division
28. What kinds of chemicals cause cancer?	Carcinogens
29. What is a non-communicable disease?	A disease that cannot be spread to other people
30. Name 4 plant organs	Flowers, roots, stem, leaves
31. State the function of the following tissues/part in a plant leaf a) Cuticle b) Palisade mesophyll c) Spongy mesophyll d) Stomata e) Guard cells f) Xylem g) Phloem	Cuticle – prevent water loss Palisade mesophyll – photosynthesis Spongy mesophyll – allows gasses to move around the leaf Stomata – allows water out and gases in and out of the leaf Guard cell – controls the stomata
32. Why do sugars have to be moved around the plant?	Need to be moved from where they are made to where they are used/stored

Infection and Response

1. What is a communicable disease?	Disease that can be spread to other people
2. What is the definition of a pathogen? What are the 4 types of pathogens?	Pathogen – microorganism that causes disease Bacteria, fungi, virus, protist
3. How do pathogens cause disease?	Bacteria multiply and release toxins Viruses invade cells and cause them to burst
4. State 3 ways diseases can be spread.	Airborne, waterborne, sexual contact, direct contact, mother to baby, foodborne
5. For HIV, state the type of pathogen that causes it, how it spreads, its symptoms and how it can be treated/prevented	Virus Spread through sexual contact/blood transfer Flu like symptoms that progress to AIDS as it attacks the immune system Good hygiene, safe sex, not sharing needles
6. For salmonella, state the type of pathogen that causes it, how it spreads, its symptoms and how it can be treated/prevented	Bacteria Foodborne disease, usually undercooked chicken Vomiting, nausea, stomach pain Cook food thoroughly, reliable kitchen hygiene Painkillers, antibiotics if severe

7. For TMV, state the type of pathogen that causes it, how it spreads, its symptoms and how it can be treated/prevented	Virus Spread through contact with infected plants such as soil or water and touching leaves Stunted growth, mottled leaves, reduced yield Destroy infected plants, destroy infected soil, don't allow tools to touch leaves of plants
8. For Rose Black Spot, state the type of pathogen that causes it, how it spreads, its symptoms and how it can be treated/prevented	Fungus Spread through contact of infected plants Black or purple spots on leaves that turn yellow and fall off Destroy infected plants, don't touch the leaves with tools
9. For measles, state the type of pathogen that causes it, how it spreads, its symptoms and how it can be treated/prevented	Protist Spread through mosquito bites Fever, sweats and chills Antimalaria tablets, sleeping under nets, insecticide to kill mosquito
10. For gonorrhoea, state the type of pathogen that causes it, how it spreads, its symptoms and how it can be treated/prevented	Bacterium Spread through sexual contact Unusual discharge from the genitals, pain when urinating Safe sex, condom use Antibiotics may be prescribed
11. Describe 3 ways by which white blood cells fight infections	Produce antitoxins Produce antibodies Engulf pathogens
12. How do vaccines work?	Introduce a dead or weal pathogen to the body

	The white blood cells begin to produce antibodies If a person is infected with the real pathogen the immune system can quickly fight it
13. What is the difference between an antibiotic and a painkiller?	Antibiotics kill bacteria Painkillers only deal with pain
14. Name the plant that aspirin and digitalis come from..	Aspirin – willow tree Digitalis - Foxgloves
15. Why can antibiotics not kill viruses?	Viruses replicate inside cells and antibiotics would have to kill the cell to kill the virus
16. What plant does aspirin come from and what is it used to treat?	
17. What are the 3 stages of pre-clinical testing? State their purpose.	Testing on cells- to see if the drug kills the cells Testing on healthy volunteers- to look for side effects Testing on a small group of volunteers with the disease- to test for efficacy and dosage
18. Why test on healthy volunteers first?	To look for side effects

19. What is a placebo?	A ‘fake’ drug, that looks like the actual drug but contains no active ingredients

Bioenergetics

1. What is the word equation for photosynthesis?	Carbon dioxide + water--> Glucose + oxygen
2. Name 2 more things needed by the plant to photosynthesise. Explain their function.	Light for energy. Chlorophyll to absorb light
3. Where does photosynthesis take place inside a plant cell?	Chloroplast
4. How does the plant get carbon dioxide and water into the plant?	Carbon dioxide by diffusion through the stomata Water by osmosis through the roots
5. State 5 uses of glucose by the plant.	Respiration Making proteins Storing as starch in seeds Storing as fats Cellulose cell wall
6. What is the word equation for aerobic respiration?	Glucose + Oxygen--> Carbon dioxide + water + energy
7. What is the purpose of respiration?	To produce energy
8. Where does aerobic respiration take place in cells?	Mitochondria
9. What do organisms require energy for?	Muscle contraction Active transport Maintaining temperature
10. What is the word equation for	Glucose--> Lactic acid + energy

anaerobic respiration in muscles of animals?	
11. What changes happen in the body in response to exercise?	Heart rate increases, breathing becomes more rapid and deeper, sweating, vasodilation
12. Why does cardiac output increase during exercise?	Heart needs to pump more oxygen to cells for more respiration to produce more energy for muscle contraction
13. What happens to muscles during prolonged periods of vigorous exercise?	They become fatigued due to a build up of lactic acid
14. What is the word equation for anaerobic respiration in yeast and plant cells?	Glucose--> Ethanol + carbon dioxide + energy
15. What is fermentation?	Anaerobic respiration in yeast and plants
16. Why is fermentation useful?	Ethanol for the making of alcohol Carbon dioxide used for making bread rise