

Biology Revision

Website: www.focuselearning.co.uk

Username: student@riverseducation41229

Password: sudmvgwbe

	Topic	Key Concepts	Weblink
1	Cells	Cells can be prokaryotic or eukaryotic. Plant and animal cells have similarities and differences. Identify the subcellular structures in bacterial cells.	GCSE Biology Revision "Eukaryotes and Prokaryotes"
2	Microscopy	Microscopes magnify things – make them look bigger. Magnification formula. Preparing a microscope slide. Using a light microscope. Drawing your observations.	GCSE Biology Revision "Microscopy" GCSE Biology Revision "Required Practical 1: Microscopes"
3	Cell differentiation and specialisation	Specialised cells carry out specific functions. Examples of specialised cells: • Sperm cells • Nerve cells • Muscle cells • Root hair cells • Phloem cells • Xylem cells	GCSE Biology Revision "Animal Cell Specialisation"
4	Chromosomes and mitosis	Chromosomes contain genetic information The cell cycle – mitosis, makes new cells.	GCSE Biology Revision "Cell division by Mitosis"
5	Binary fission	Bacteria reproduce by binary fission	GCSE Biology Revision "Bacterial Division" (Triple)
6	Cultivating microorganisms (RP)	Growing bacteria in the lab. Investigate the effect of antibiotics on bacterial growth. The need to use uncontaminated cultures.	GCSE Biology Revision "Required Practical 2: Culturing Microorganisms" (Triple)
7	Stem cells	Stem cells can differentiate into different types of cells. Stem cells may be able to cure many diseases. Some people are against stem cell research. Stem cells can produce identical plants.	GCSE Biology Revision "Stem Cells"

8	Diffusion	The spreading out of particles from an area of higher concentration to an area of lower concentration. Cell membranes control the substances that enter and leave a cell.	GCSE Biology Revision "Diffusion"
9	Osmosis	Osmosis is the movement of water molecules across a partially permeable membrane from a less concentrated solution to a more concentrated solution. The effect of sugar solutions on plant tissues.	GCSE Biology Revision "Osmosis"
10	Active transport	Root hairs take in minerals and water Root hairs take in minerals by active transport.	GCSE Biology Revision "Active Transport"
11	Exchanging substances	Organisms exchange substances with their environment Calculating an organ's surface area to volume ratio. Adaptations of multicellular organisms for gas exchange: • Thin membrane – short distance • Large surface area • Lots of blood vessels Gas exchange happens in the lungs. The villi provide a large surface area for gas exchange. Leaves let gases diffuse in and out of cells. Gills have a large surface area for gas exchange.	GCSE Biology Revision "Gas Exchange in the Lungs" GCSE Biology Revision "Surface Area to Volume Ratio"
12	Cell organisation	Large multicellular organisms are made up of organ systems. Similar cells make up tissues. Tissues make up organs. Organs make up organ systems.	GCSE Biology - Levels of Organisation - Cells, Tissues, Organs and Organ Systems (2026/27 exams)
13	Enzymes	Enzymes are catalysts. Enzymes have a special shape – active site. Enzymes need the right temperature and pH. Digestive enzymes breakdown big molecules. Bile neutralises stomach acid and emulsifies (breaks down) fats.	GCSE Biology Revision "Required Practical 5: Effect of pH on Amylase"
14	Food tests (RP)	Benedicts solution is used to test for sugar. Iodine solution is used to test for starch.	GCSE Biology Revision "Required Practical 4: Food Tests"

		Biuret solution is used to test for protein. Sudan III solution is used to test for lipids (fats)	
15	The lungs	Air moves in and out of the lungs. Alveoli carry out gas exchange. Calculating the breathing rate of a person.	GCSE Biology Revision "Gas Exchange in the Lungs"
16	Circulatory system – The Heart	Humans have a double circulatory system. The heart pumps blood around the body. The heart has a pacemaker.	GCSE Biology Revision "The Heart and Circulation"
17	Circulatory system – Blood vessels	Arteries carry blood under pressure. Capillaries are really thin. Veins take blood back to the heart. Calculating the rate of blood flow.	GCSE Biology Revision "Arteries, Veins and Capillaries"
18	Circulatory system – Blood	Red blood cells carry oxygen. White blood cells defend against infection. Platelets help blood clot. Plasma is the liquid that carries everything in the blood.	GCSE Biology Revision "The Blood"
19	Cardiovascular diseases	Coronary heart disease is a disease of the coronary arteries. Stents keep coronary arteries open. Statins reduce cholesterol in the blood. An artificial heart can pump blood around the body. Faulty heart valves can be replaced.	GCSE Biology Revision "Cardiovascular Diseases"
20	Health and Disease	Diseases are a major cause of ill health. Communicable and non-communicable diseases. Risk factors increase your chance of getting a disease.	GCSE Biology Revision "Communicable and Non-Communicable Disease"
21	Cancer	Cancer is caused by uncontrolled cell growth and division. Risk factors can increase the chance of some cancers: • Lifestyle factors • Genetic factors	GCSE Biology Revision "Cancer"
22	Plant cell organisation	Plant cells are organised into tissues and organs. Leaves contain: • Epidermal tissue • Mesophyll tissue • Xylem tissue • Phloem tissue	

23	Transpiration and translocation	Phloem tubes transport food. Xylem tubes transport water. Transpiration is the loss of water from a plant. Transpiration rate is affected by 4 main things: • Air flow – windy. • Temperature • Humidity • Light intensity Guard cells control gas exchange and water loss.	
24	Communicable disease	There are several types of pathogens: bacteria, viruses, protists. Fungi. Pathogens can be spread in different ways: • Water • Air • Direct contact The spread of disease can be reduced by: • Being hygienic • Destroying vectors • Isolating infected individuals. • vaccination	
25	Bacterial diseases	Bacteria are very small living cells. Salmonella and gonorrhoea are bacterial diseases.	
26	Viral diseases	Viruses are not cells – they are much smaller. Different viruses cause different diseases: • measles • HIV • Tobacco mosaic virus	
27	Protist and fungal diseases	Rose black spot is a fungal disease. Malaria is a disease caused by a protist.	
28	Fighting disease	The body defence system: • The skin • Nose hairs • Mucus (snot) • Cilia – windpipe • Stomach acid The immune system can attack pathogens: • Phagocytosis • Producing antibodies • Producing antitoxins	

29	Fighting disease – vaccination	Vaccination – protects from future infection	
30	Fighting diseases – drugs	Some drugs get rid of symptoms – others cure the problem. Bacteria can become resistant to antibiotics. Many drugs first came from plants: • Aspirin – willow • Digitalis – foxglove	
31	Developing drugs	There are different stages in the development of new drugs: • Preclinical testing • Clinical testing	
32	Plant diseases and defences	Plants need mineral ions. Plants have defences against diseases and damage: • Physical defences • Chemical defences • Mechanical defences	
33	Photosynthesis	Photosynthesis produces glucose using light. Photosynthesis word equation Plants use glucose in 5 main ways: • For respiration • For making cell walls • For making amino acids • Stored as oils or fats. • Stored as starch.	
34	The rate of photosynthesis (RP)	The rate of photosynthesis is affected by: • Light intensity • Carbon dioxide concentration • Temperature Oxygen production shows the rate of photosynthesis.	
35	Respiration and metabolism	Respiration is not ‘breathing in and out’ Respiration transfers energy for all kinds of things. Metabolism is all the chemical reactions in an organism.	
36	Aerobic and anaerobic respiration	Aerobic respiration needs plenty of oxygen. Anaerobic respiration is used if there is not enough oxygen. Anaerobic respiration in plants and yeast	
37	Exercise	When a person exercises, they respire more. Hard exercise can lead to anaerobic respiration.	

		Anaerobic respiration leads to an oxygen debt.	
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