Oasis Science

**Science Knowledge Organiser**

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| | **Year:** | **8** |
| | **Term:** | **Su2** |
| | **Topic:** | **The Lungs (B.18)** |
| 1 | Name the 6 main structures of the respiratory system | Mouth, nose, trachea, bronchus, bronchioles, alveoli |
| 2 | State three ways that the lungs are adapted for gas exchange | 1) Thin walls, 2) good blood supply, 3) moist walls |
| 3 | Define "diffusion" | The moment of particles from a high concentration to a low concentration |
| 4 | Which gas diffuses from the alveoli (lungs) into the blood? | Oxygen |
| 5 | Which gas diffuses from the blood into the alveoli (lungs)? | Carbon dioxide |
| 6 | Which chemical in the red blood cells attaches to oxygen so that it can carry it around the body? | Haemoglobin |
| 7 | What happens to the diaphragm, ribs and lungs during inhalation? | Ribs = expand, diaphragm = contract, lungs = inflate |
| 8 | What happens to the diaphragm, ribs and lungs during exhalation? | Ribs = contract, diaphragm = relaxes, lungs = deflate |
| 9 | Which cells line the trachea to sweep the mucus and dust from the lungs? | Ciliated cells |
| 10 | Which disease destroys the alveoli? | Emphysema |
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| | **Topic:** | **The Heart (B.19)** |
| 1 | Name the four chambers of the heart | Right atrium, left atrium, right ventricle, left ventricle |
| 2 | Which blood vessel enters the heart from the lungs? | Pulmonary vein |
| 3 | Which blood vessel enters the heart from the body? | Vena Cava |
| 4 | Which blood vessel leaves the heart taking blood to the lungs? | Pulmonary artery |
| 5 | Which blood vessel leaves the heart taking blood to the body? | Aorta |
| 6 | Which structure prevents blood from flowing backwards | Valves |
| 7 | Which side of the heart is thicker? | The left side |
| 8 | Which side of the heart contains oxygenated blood? | The left |
| 9 | Which blood vessels travel into the heart? | VeINs |
| 10 | Which blood vessels travel out of the heart? | Arteries |
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| | **Topic:** | **Respiration (B.20)** |
| 1 | Define aerobic respiration | Glucose reacts with oxygen to release energy |
| 2 | What is the word equation for respiration? | Glucose + oxygen -> carbon dioxide + water (+energy) |
| 3 | What is the symbol equation for respiration? | $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$ (+energy) |
| 4 | Where does aerobic respiration occur? | In the mitochondria |
| 5 | Define 'anaerobic respiration' (extension only) | Glucose is broken down without oxygen to release energy |
| 6 | Where does anaerobic respiration occur? (extension only) | In the cytoplasm |
| 7 | How does breathing rate change with exercise? | It increases |
| 8 | How does heart rate change with exercise? | It increases |
| 9 | Why does breathing rate change with exercise? (extension only) | To get more oxygen into the blood |
| 10 | Why does heart rate change with exercise? (extension only) | To get more oxygen and glucose to the muscles for respiration |
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| | **Topic:** | **Disease 1 (B.21)** |
| 1 | Define "communicable disease" | A disease that can be spread from person to person |
| 2 | Define "non-communicable disease" | A disease that cannot be spread from person to person |
| 3 | Define "microorganism" | A living thing that can only be seen through a microscope |
| 4 | Define "pathogen" | Disease causing microorganism |
| 5 | Give 2 examples of communicable diseases | Malaria, salmonella |
| 6 | Give 2 examples of non-communicable diseases | Diabetes, heart disease |
| 7 | State 4 ways that diseases can be transferred from person to person | Air, direct contact, water, sex |
| 8 | Name the 4 disease causing microorganisms | Virus, bacteria, fungi, protist |
| 9 | Which types of pathogen can be treated using antibiotics? | Bacteria |
| 10 | State 4 ways that we can prevent the spread of diseases | Washing hands, cooking food properly, using condoms, covering mouth |
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| | | **Topic:** | **Disease 2 (extension) (B.22)** |
| | 1 | State 5 ways that the body can protect itself from pathogens (non-specific) | Skin, tears, ciliated cells, scabs, stomach acid |
| | 2 | What is the name of the main cells in the immune system? | White blood cells |
| | 3 | How do bacteria make us unwell? | Produce toxins |
| | 4 | How do viruses make us unwell? | Replicate inside cells making them burst |
| | 5 | State three ways that white blood cells can help us to fight pathogens. | 1) Phagocytosis 2) antitoxin production 3) antibody production |
| | 6 | What is inside a vaccination? | Dead/weak form of pathogen |
| | 7 | How does a vaccination help us to prevent diseases | Our white blood cells learn to kill pathogen quickly |
| | 8 | Why don't we vaccinate against all diseases? | Vaccinations are expensive |
| | 9 | Why can't antibiotics be used to treat flu? | Flu is caused by a virus |
| | 10 | How can we prevent the spread of malaria? | Use mosquito nets and mosquito spray |
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| | | **Topic:** | **Cells (B.23)** |
| | 1 | State the 5 sub-cellular organelles in an animal cell | Nucleus, cell membrane, ribosomes, cytoplasm, mitochondria |
| | 2 | State the 8 sub-cellular organelles in an plant cell | Nucleus, cell membrane, ribosomes, cytoplasm, mitochondria, cell wall, chloroplast and vacuole |
| | 3 | State the function of the nucleus of a cell | Contains DNA and controls the function of the cell |
| | 4 | State the function of the cell membrane of a cell | Controls what enters and leaves the cell |
| | 5 | State the function of the ribosome of a cell | Where protein synthesis occurs (proteins are made) |
| | 6 | State the function of the cytoplasm of a cell | Where chemical reactions occur in a cell |
| | 7 | State the function of the mitochondria of a cell | Where aerobic respiration occurs in a cell |
| | 8 | State the function of the cell wall of a cell | Provides support for the cell |
| | 9 | State the function of the chloroplast of a cell | Absorbs light for photosynthesis |
| | 10 | State two functions of the vacuole of a cell | Stores minerals and sugars and gives structure |
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| | | **Topic:** | **Adaptations of specialised cells (B.24)** |
| | 1 | Define "prokaryotic cell" and "eukaryotic cell" | DNA is not contained in a nucleus |
| | 2 | Define "eukaryotic cell" | DNA contained in a nucleus |
| | 3 | State two adaptations of an ovum cells | Contains half of the DNA, lots of cytoplasm |
| | 4 | State three adaptations of sperm cells | Contains half of the DNA, lots of mitochondria, tail |
| | 5 | State two adaptations of nerve cells | Long, dendrites to connect to other cells |
| | 6 | State three adaptations of red blood cells | Large surface area, no nucleus, haemoglobin |
| | 7 | State two adaptations of muscle cells | Protein fibres to contract and relax and lots of mitochondria |
| | 8 | State two adaptations of ciliated cells | Tiny hairs (cilia) |
| | 9 | State an adaptation of a palisade cell | Lots of chloroplasts |
| | 10 | State three adaptations of a root hair cell | Large surface area, lots of mitochondria, large vacuole |
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| | | **Topic:** | **Functions of specialised cells (B.25)** |
| | 1 | State the function of ovum cells | Carry female genetic information |
| | 2 | State the function of sperm cells | Carry male genetic information |
| | 3 | State the function of nerve cells | Transmit electrical messages around the body |
| | 4 | State the function of red blood cells | Carry oxygen around the body |
| | 5 | State the function of muscle cells | Contract and relax |
| | 6 | State the function of ciliated cells | Move mucus out of airways |
| | 7 | State the function of palisade cells | Lots of chloroplasts |
| | 8 | State the function of root hair cell | Absorb water and minerals from the soil |
| | 9 | Where are stem cells found in plant and animals? | Plants = meristem, animals = bone marrow |
| | 10 | Define "stem cell" | An undifferentiated (non-specialised) cell |