Year 7 Core questions Autumn Term

7B1 Cells and body systems

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| **No.** | **Question** | **Answer** |
|  | What is a cell? | The smallest structural unit of **living** things. |
|  | Draw and label a typical plant cell. | https://studyrocket.co.uk/assets/img/drawings/sdxLPfkM5DJ7NSpHxP4hWFw.png |
|  | Draw and label a typical animal cell. | https://studyrocket.co.uk/assets/img/drawings/sdxLPfkM5DJ7NSpHxP4hWFw.png |
|  | What is the function of the nucleus? | Contains the genetic material, the ‘instructions’ for the cell. |
|  | What is the function of the cytoplasm? | Where the cell’s chemical reactions happen. |
|  | What is the function of the cell membrane? | To control what goes in and out of the cell. |
|  | What is the function of the cell wall in plants? | To protect the cell and give it shape and rigidity. |
|  | What is the function of the vacuole in plants? | It contains sugar for the cell and gives the cell shape and rigidity |
|  | What is the function of the chloroplasts in plants? | Where photosynthesis happens. |
|  | What do we call a cell with adaptations or features that make it good at doing a particular job? | A specialised cell |
|  | Give three examples of specialised cells you might find in plants or animals | Animal cells: Egg, sperm, red blood cell, white blood cell, neuron  Plant cells: palisade cell, guard cell, root hair cell |
|  | What is a unicellular organism? | An organism that is made of one single cell |
|  | What is a metric prefix? | a [unit prefix](https://en.wikipedia.org/wiki/Unit_prefix) that goes before a basic unit of measurement to show a [multiple](https://en.wikipedia.org/wiki/Multiple_(mathematics)) or [fraction](https://en.wikipedia.org/wiki/Fraction_(mathematics)) of the basic unit |
|  | What is a microscope? | Instrument for viewing very small objects that cannot be seen with the naked eye e.g. cells |
|  | What is magnification? | How much bigger something appears compared with its actual size |
|  | How do you calculate the magnification of a microscope? | Total Magnification **=** magnification of OBJECTIVE lens **x** magnification of EYEPIECE lens |
|  | How do you calculate the magnification of a specimen under the microscope? | magnification = measured size / actual size. |
|  | What do we call a group of cells of the same type working together? | Tissue |
|  | What do we call a structure made up of a group of tissues, working together to perform specific functions? | An organ |
|  | What is an enzyme? | A protein made in cells to help a chemical reaction to happen. |

7C1 Atom and the periodic table

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| What is an atom? | The smallest part of an element that can exist |
| Describe Dalton’s model of the atom. | Atoms as solid spheres that cannot be divided into smaller parts |
| What is an element? | A substance made of one type of atom e.g oxygen=O2, Iron= Fe |
| What is a molecule? | A particle made of two or more atoms joined together e.g. Oxygen =O2, Water =H2O |
| What is a diatomic molecule? | A molecule that consists of two atoms, often the same. E.g. O2 , Cl2 |
| What is a chemical symbol? | A one or two universal letter code of each element |
| Where are chemical symbols of elements found? | In the periodic table |
| What is a compound? | A substance made of more than one type of atom chemically joined together. E.g. Water = H2O, Carbon dioxide = CO2 |
| What is a chemical formula? | A formula that shows the number and type of atoms present in a molecule. |
| What do the compound endings:   1. ide 2. ate   mean? | 1. ide – a compound of only the named substances 2. ate – a compound of the named substances and oxygen |
| What is a physical change? | Changes of state as no new substances are made. |
| What is a chemical change (Chemical reaction)? | When atoms rearrange to make new substances |
| Where do we find metals in the period table? | On the left |
| Where do we find non-metals on the periodic table? | On the right |
| Who designed the modern periodic table? | Mendeleev |
| What are the groups in the periodic table? | Columns |
| What are the rows called in the periodic table? | Periods |
| What are the physical properties of most metals? | Good conductors of electricity, good conductors of heat, shiny, high density (heavy for its size), malleable (can be hammered), sonorous (makes a ringing sound when hit ), ductile (can be pulled into wires), high melting points (except mercury), hard |
| What are the physical properties of non-metals? | Poor conductors of electricity, poor conductors of heat, dull, low density (light for its size), brittle ( breaks easily), non-sonorous ( no ringing sound when hit), low melting points |

7P1 Forces and motion

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| Name 8 forces | Thrust, air resistance, friction, weight/gravity, reaction, upthrust, lift, magnetism |
| State the unit for force | Newton, N |
| State an example where friction is useful | Any example of useful friction (e.g. shoes on floor, tyres on road) |
| What is the motion of the car if all forces are balanced? | Constant speed/stationary |
| If C is weight/gravity, what is the force A? | Reaction |
| Suggest how you can decrease friction | Using a lubricant such as oil, Vaseline or ball bearings |
| If force A is 10N and force C is 10N, what is the resultant force acting on this object: | 0N |
| What is the unit for weight? | Newtons, N |
| If an object has a resultant force of 0N, describe its motion | It is either stationary or moving at a constant speed |
| State an example of when friction is not useful | Any example of friction not being useful (e.g. in an engine, axles, motor, machinery) |
| What two things do the arrows on a force diagram demonstrate? | Size of force  Direction of force |
| If D is thrust, suggest the name of force B | Friction/drag/air resistance |
| If D is thrust, describe the motion of the object | The object is accelerating in the direction of D |

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| **No** | **Core question** | **Answer** |
| 1 | Name **three** common speeds | 1. sound in air 330m/s 2. walking pace 1.4m/s 3. car in built up area 10.5m/s 4. car on motorway 31m/s 5. an aeroplane 250 m/s 6. light in a vacuum 300,000,000m/s. |
| 2 | What is the equation to calculate speed? | Speed = distance  time |
| 3 | What are the SI units of distance? | Metres (m) |
| 4 | What are the SI units of time? | Seconds (s) |
| 5 | What are the SI units of speed? | Metres per second (m/s) |
| 6 | Draw the equation triangle for speed | **d**  **s**  **tt** |
| 7 | Rearrange the speed equation to make distance the subject (d= ? ) | d = s x t |
| 8 | Rearrange the speed equation to make time the subject (t = ?) | t= d  s |
| 9 | What is a scalar quantity? Give an example | a quantity that has a magnitude only  e.g. speed, mass, temperature |
| 10 | What is a vector quantity? Give an example | a quantity that has both a magnitude and a direction  e.g velocity, acceleration, force |

7B2 Gas exchange

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| What are the characteristic processes of life? | Movement, respiration, sensitivity, nutrition, excretion, reproduction, growth |
| What are all living and previously living organisms made of? | Cells |
| What is respiration? | A cellular process that releases energy from food and oxygen |
| How do molecules move through cytoplasm? | Diffusion |
| Place the following in size order- molecule, cell and atom | Atom- molecule- cell |
| How can we describe the cell membrane? | As a semi-permeable membrane (some molecule are able to diffuse through it) |
| What are the key features of diffusion? | * All particles are in constant motion * Diffusion involves the movement of particles * It results from the random motion/collision of particles |
| What happens when a gas reaches equilibrium? | The particles continue to move but the net movement results in an equal amount of particles on each side of the membrane |
| What is the relationship between surface area of a membrane and the rate of diffusion? | As surface area increases the rate of diffusion increases too. |
| How are the alveoli adapted to maximise rates of diffusion? | Alveoli are adapted to provide a very large surface area for diffusion |
| Label the structure of the respiratory system  [Related image](https://www.google.co.uk/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&ved=2ahUKEwitm8yxzqriAhVGzRoKHR_BAd8QjRx6BAgBEAU&url=http://pinnacleeventswnc.com/respiratory-system-diagram-quiz/respiratory-system-diagram-quiz-amazing-structure-human-body/&psig=AOvVaw1rr6Pm3D6Q_MKzZGVbfebP&ust=1558458886648959) | [Image result for blank diagram of respiratory system](https://www.google.co.uk/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&ved=2ahUKEwjsqrj2zariAhVIz4UKHVIUDs4QjRx6BAgBEAU&url=http://www.chsh-teach.com/pt/The-Respiratory-System-Teaching-Resources-and-Downloads/wiki.htm&psig=AOvVaw1rr6Pm3D6Q_MKzZGVbfebP&ust=1558458886648959) |
| What is the composition of inhaled air? | 78% nitrogen, 21% oxygen, 0.04% carbon dioxide (as well as water vapour, other gases and particulates) |
| What is the composition of exhaled air? | 78% nitrogen, 17% oxygen, 4% carbon dioxide |
| How do we breathe in (ventilate)? | Our diaphragm is pulled down, anad the ribs are lifted up increasing the volume of the chest cavity. Air moves in to equalise the pressure. |
| How do we breathe out? | The muscles pulling on the diaphragm relax and this rises up, the ribs move in and the volume of the chest cavity decreases. Air moves out to balance the pressure. |
| What is the vital lung capacity? | The maximum amount of air you can breathe in and out |

7C2 Particles

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| What is an atom? | The smallest part of an element, atoms are the building blocks of molecules |
| What is diffusion? | The movement of one substance through another substance. |
| How are the particles arranged in a gas? | C:\Users\egoodliffe\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\FA2F7ADA.tmpThey are very far apart, moving very fast, they have lots of energy and are arranged randomly. |
| What is kinetic energy? | The energy of movement. |
| How are the particles arranged in a liquid? | C:\Users\egoodliffe\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\C037DAA0.tmpThey are close together and touching, they can move past one another and are arranged in an irregular fashion. |
| What is a molecule? | A molecule is a group of atoms that have been chemically joined together. |
| What is a particle? | A very small part of a substance, it is sometimes used instead of the word molecule. |
| How are the particles arranged in a solid? | C:\Users\egoodliffe\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\AE64E8C4.tmpThey are close together and touching, they cannot move past one another and are arranged in a regular orderly fashion. |
| Describe the Dalton model of the atom | Atoms are the smallest part of an element |
| What are the three states of matter | Solids, liquids and gases |
| Use a simple kinetic theory model to explain solids in terms of movement and arrangement of particles | * Particles vibrate * Forces of attraction between particles are strong * Which is why particles do not flow * Solids keep their shape * Solids cannot be compressed |
| Use a simple kinetic theory model to explain liquids in terms of movement and arrangement of particles | * Particles flow * Particles have moderate forces of attraction * Liquids take shape of container * Liquids flow * Liquids cannot be compressed |
| Use a simple kinetic theory model to explain gases in terms of movement and arrangement of particles | * Particles move fast * Particles are far apart * Gases expand to fill container * Gases can be compressed |
| Describe Brownian motion in gases | * The random motion of particles due to the collisions between themselves |
| Describe diffusion of particles in gases and liquids | Particles diffuse from high concentration to low concentration |
| Explain why gases and liquids can diffuse | Forces of attraction between particles are weak enough to allow particles to flow |
| What causes gas pressure? | Gas particles colliding with the walls of a container |

7P2 Energy

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| Question | Answer |
| 1. What is the symbol and unit for energy? | Joule, J |
| 1. Name 9 forms of energy | Gravitational potential energy  Chemical  Sound  Electrical  Nuclear  Light  Thermal  Elastic  Kinetic |
| 1. Describe what is meant by a system | An observed object or environment. This could be as big as the universe, a room, a car, a beaker or a petri dish. |
| 1. Describe what is meant by conservation of energy | The total energy in a closed system remains the same when an energy transfer takes place |
| 1. Draw an energy transfer diagram for a car speeding up |  |
| 1. Draw an energy transfer diagram for when a ball falls and lands on the ground |  |
| 1. Draw an energy transfer diagram for stretching a spring |  |
| 1. Draw an energy transfer diagram for when food is used in our bodies |  |
| 1. State 2 common waste energies | Thermal and sound |
| 1. Describe what happens to waste energy | It is dissipated to the surroundings |