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| **YR 10** | **Autumn 1** | **Autumn 2** | **Spring 1** | **Spring 2** | **Summer 1** | **Summer 2** |
| **Content** | Unit 1: Building BlocksStates of matterMatter & particlesDensityInternal energySpecific heat capacitySpecific latent heatAtomic StructureScientific models of the atomSub-atomic particlesElectronic structures | Unit 1: Building BlocksCells in animals and plantsEukaryotic and prokaryotic cellsDiffusionOsmosisActive transportCell divisionWaves The nature of wavesLight, infrared, microwaves & radiowavesCommunicationsUltraviolet, x-rays, & gamma raysX-rays in medicine | Unit 6: Interactions over small and large distancesForces and energy changesVectors and scalarsForces between objectsResultant forcesForces and elasticityStructure and bondingAtoms into ionsIonic bondingGiant ionic structuresCovalent bondingStructure of simple moleculesGiant covalent structuresBonding in metalsMagnetism and electromagnetismMagnetic FieldsElectromagnetism | Unit 3: Interactions with the environmentLifestyle and healthHealth & diseaseNon-communicable diseasesSmoking & the risk of diseaseDiet, exercise and diseaseAlcohol and other carcinogensPrinciples of homeostasisThe control of blood glucose levelsHuman reproductionRadiation and riskAtoms and radiationRadioactivityNuclear chargesPenetrating properties of radiationRadiation hazards | Unit 3: Interactions with the environmentPreventing, treating, and curing diseasesPathogens & diseasePreventing infectionsViral diseasesBacterial diseasesHuman defence responsesVaccinationAntibiotics and medicineStem cells in medicine | Unit 8: Guiding spaceship Earth to a sustainable futureCarbon chemistryFullerenes & grapheneHydrocarbonsFractional distillation of oilCracking hydrocarbonsResources of materials and energyExtracting metalsEnergy demandsEnergy from wind and waterSolar powerEnergy & the environmentReduce, reuse, recycle |
| **Key new knowledge** | **States of matter:**Name the changes of stateChanges that occur in terms of energy changes & particle behaviour.Calculate density.Measure specific heat capacity & latent heat of vaporisation.**Atomic Structure:**Sub-atomic particles & structure of an atom.Use the periodic table to deduce the number of sub-atomic particles in atoms, ions, & isotopes.Rules of placing electrons in each energy level of an atom.Standard electronic notations and electronic structure of some elements. | **Cells in animals & plants:**Movement occurs in diffusion, osmosis, and active transport.Interpret diagrams showing diffusion, osmosis, and active transport.Mitosis and meiosis, relating to cell division.**Waves:**Amplitude, wavelength, peak, and trough of a wave.Wave equationsDifferent parts of the electromagnetic spectrum. | **Forces and energy changes:**Examine physical quantitiesThe nature and representation of vectors and scalars The action of individual forces on objectsNewton’s First Law of motionEnergy changes Apply concepts of elastic behaviour and linear stretching**Structure and bonding:**Different types of bonding in substancesFormation of ionsFormation of ionic and covalent bondsFormation of alloys**Magnetism and electromagnetism:**Magnetic fields in terms of field lines or lines of forceExplore the shape of fieldsThe magnetic effect of a current-carrying wire. | **Lifestyle and health:**Lifestyle factors that can affect healthThe difference between communicable and non-communicable diseasesDifferent treatments for cardiovascular disease, the risks and benefits associated with treatmentHomeostasis in the body and the control of blood sugar levelsCauses, effects, and treatments of type 1 and type 2 diabetes **Radiation and risk:**What happens when atoms lose energyMeasuring radioactivityRadioactive decay in the form of a nuclear equationCalculate half lifeHazards associated with radiation, including cancerDifferent causes of cancerBenefits and risks of treatments available for cancer | **Preventing, treating, and curing diseases:**How disease affects the bodyHow diseases are caused by pathogensMethods to prevent the spread of diseaseThe body’s different defence mechanisms How vaccination worksUses of other medicinal drugs; antibiotics and painkillersDouble-blind trialsRecent advancements in the treatment of diseasesThe role of genetic modification and stem cells in modern medicine | **Carbon chemistry:**The structure, properties, and uses of large carbon molecules, fullerenes, and graphene’sThe structure of the first four alkanes (methane, ethane, propane, and butane)Complete and incomplete combustion of hydrocarbonsThe structure of the alkenes produced in cracking**Resources of materials and energy:**Extraction of metals from their oresThe extraction of aluminium from its oxide through electrolysisThe UK’s energy demands and ways to meet this demandHow systems can be analysed in terms of energyCalculate the efficiency of a range of energy transfer processes |
| **Assessments** | End of chapter summary questions.Required practical notes and observations.Retrieval tasks.Practice exam questions. | End of chapter summary questions.Required practical notes and observations.Retrieval tasks.Practice exam questions. | End of chapter summary questions.Required practical notes and observations.Retrieval tasks.Practice exam questions. | End of chapter summary questions.Required practical notes and observations.Retrieval tasks.Practice exam questions. | End of chapter summary questions.Required practical notes and observations.Retrieval tasks.Practice exam questions. | End of chapter summary questions.Required practical notes and observations.Retrieval tasks.Practice exam questions. |

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| **YR 11** | **Autumn 1** | **Autumn 2** | **Spring 1** | **Spring 2** | **Summer 1** | **Summer 2** |
| **Content** | Unit 5: Building blocks for understandingThe periodic tableDevelopment of the periodic tableGroup 1 – the alkali metalsGroup 7 – the halogensChemical quantitiesAtoms, elements & compoundsChemical equationsRelative masses & molesConcentrations of solutions  | Unit 2: Transport over larger distancesSystems in the human bodyExchanging materialsThe bloodThe heartBreathing & gas exchangeHow the digestive system worksThe human nervous systemReflex actionsPrinciples of hormonal controlPlants & photosynthesis Specialised plant cells Plant tissues & organsEvaporation & transpirationPhotosynthesis Plant diseasesChlorophyll & chromatograms  | Unit 7: Movement & Interactions Forces and motionSpeed & distance-time graphsVelocity & accelerationAnalysing motion graphsFree fall & terminal velocityElectricitySeries circuitsParallel circuitsDirect & alternating currentsEnergy & powerThe rate and extent of chemical changeMeasuring rate of reactionCollision theory & surface areaThe effect of temperatureThe effect of concentrationThe effect of catalystsReversible reactions | Unit 4: Explaining changeThe Earth’s atmosphereHistory of the Earth’s atmosphereMaterial recyclingThe Carbon CycleThe greenhouse effectAtmospheric pollutantsPotable waterEcosystems and biodiversityOrganisation in ecosystemsFeeding relationshipsCompetition in animals and plantsField investigationsInheritance, variation & evolutionDNA & the genomeInheritance in actionVariationEvolution by natural selectionClassification systemsSelective breedingGenetic engineering | Exam PreparationExams | Exam PreparationExams |
| **Key new knowledge** | **The Periodic Table:**The development of the Periodic Table from its experimental originsInterpret chemical formulae Physical and chemical properties of group 1 and group 7 elementsElectron configurations**Chemical quantities:**How chemical symbols are used and what they representSkills in writing chemical equations for different reactionsBalancing equationsRelative atomic mass and relative formula mass for compoundsCalculating the concentration of a solution | **Systems in the human body:**Outline the processes that occur in the gas exchange system, circulatory system, digestive system, nervous system, and endocrine systemIdentify the different blood vessels and major components of bloodknow the major parts of the nervous and endocrine systems **Plants & photosynthesis:**The adaptation of cells and tissues in a plantThe requirement of photosynthesis Process of transpirationChromatography to separate pigments or dyes | **Forces and motion:**Analyse distance-time graphs Use the speed equationAnalyse motion using using velocity-time graphsAnalyse motion using using concepts of kinetic energy and energy transfer**Electricity:**Calculate the charge flow in an electric circuitCalculate the power of an electrical applianceWork out potential difference and resistance in an electric circuit | **The Earth’s atmosphere:**The effects of human activity on air and water qualityWhy has the atmosphere of the Earth has changed?Causes of the greenhouse effectFormation of acid rainChanges in carbon cycle and water cycle**Ecosystems & biodiversity:**Resources that organisms compete forOrganisms living interdependently Reasons for population changes Predator-prey relationshipsConduct a field investigationUse quadrats and transects Eutrophication and bioaccumulationEffect of increasing human populationEffects of deforestation and pollution**Inheritance, variation and evolution;**Variation - genes and the environmentSex characteristics and monohybrid inheritanceGenetic diagrams and probability of inheritance characteristicsGenotypes and phenotypes of parents and offspringProcess of evolutionMechanism of natural selectionClassification systemsSelective breeding and genetic engineering for inherited characteristics | Study leaveRevision Revision booklets | Study leaveRevision Revision booklets |
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