



Pleckgate
HIGH SCHOOL



Aspire & Believe. Act & Succeed.

Year 9 Revision List





Mathematics

Key information:

- x2 50 minute papers for all pupils
- Those in 9 Byron, 9 Einstein, 9 Euclid, 9 Newton, 9 Noether will do the support and core.
- All other pupils will do core and higher. These exams will be sat after the year 10 tests.

Topics to revise:

- Recognise enlargement and similarity.
- Solve problems with similar triangles.
- Enlarge by positive fractional SF.
- Use Pythagoras in 3D.
- Use Pythagoras on axes.
- Enlarge from COE.
- Calculate shorter sides in right angled triangle.
- Compare and contrast rotational symmetry and line symmetry.
- Angle problems with algebra.
- Identify hypotenuse in a right angled triangle.
- Calculate simple and compound interest.
- Unit pricing problems.
- Solve fraction problems
- Determine if a triangle is right-angled.
- Identify order of rotational symmetry
- Compare rotation and reflection of shapes.
- Find the result of a series of transformations
- Solve problems with exchange rates.
- Angle problems using chains of reasoning.
- Numbers in standard form.
- +, -, x and \div fractions.
- HCF AND LCM
- Draw and measure angles.
- Surface area of triangular prisms.
- Volume of other 3D shapes.
- Solve problems with integers and decimals.
- Locus of distance from two lines.
- Plans and elevations.
- Directed number
- Locus of distance from a point and straight line.
- Construct perpendicular to a point.
- Construct triangles.
- Surface area of a cylinder.
- Know names of 2D and 3D shapes.
- Write an equation in the form $y=mx=c$
- Conjectures about number.
- Formulae and equations
- Explore perpendicular lines.
- Lines parallel to the axis.
- Conjectures with algebra.
- Equations and inequalities with brackets.
- Find the equation of a line from the graph.
- Equations and inequalities with unknowns on both sides.
- Expand a pair of binomials.
- True or false.
- Using table of values



English

Key information:

Pupils in Year 9 should prepare for the end of year examinations by revisiting the key knowledge and skills they have learnt throughout this academic year.

Pupils are encouraged to refer to the learning in their exercise books, the knowledge organisers and the resources on Google classroom to support their revision.

Pupils are expected to learn and memorise the subject specific vocabulary along with the definitions. In preparation for the writing section of the assessment, pupils should create word banks for common words and practise the spellings of more ambitious vocabulary.

Also, pupils should know how to accurately use different types of punctuation in their writing.

Topics to revise:

HT1 – Power Dynamics: features of dystopian fiction, key vocabulary and definitions, narrative structure.

HT2 – Individual Power: Art of Rhetoric, Ciceronian six part structure, Aristotelian triad (ethos, logos, pathos), key vocabulary and definitions, persuasive techniques, different types of punctuation.

HT3 & HT4 – Conflict: The seven types of narrative conflict, Freytag's pyramid, narrative hooks, poetic devices, key vocabulary and definitions.

Narrative writing: Revisit spelling, punctuation and grammar rules, paragraphing and sentence structure. Practise using more varied and ambitious vocabulary. Pupils are encouraged to create word banks by writing synonyms for common words such as: good, bad, hot, cold, dark, light, scared, angry, happy, sad, confused.



Key information:

- [Revision Monkey Videos](#)
- [BBC bitesize](#)
- [Seneca Learning](#)

Science – Biology

Topics to revise:

Structure and Function of Living Organisms – Cells and Organisation, Cells as the fundamental unit of living organisms, Observing, interpreting, and recording cell structure using a light microscope, Functions of cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria, and chloroplasts, Similarities and differences between plant and animal cells, Role of diffusion in the movement of materials in and between cells, Structural adaptations of some unicellular organisms, Hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms

The Skeletal and Muscular Systems – Structure and Functions of the Human Skeleton, Support, protection, movement, and blood cell production, Biomechanic, Interaction between skeleton and muscles, Measurement of force exerted by different muscles, Functions of Muscles, Examples of antagonistic muscles

Nutrition and Digestion – Healthy Human Diet, Carbohydrates, lipids, proteins, vitamins, minerals, dietary fibre, and water, Importance and functions of each nutrient, Energy Requirements in a Healthy Daily Diet, Calculations of energy requirements, Consequences of Imbalances in the Diet, Obesity, starvation, deficiency diseases, Human Digestive System, Tissues and organs involved, Adaptations for digestion, Role of enzymes as biological catalysts, Importance of Bacteria in the Human Digestive System, Plant Nutrition, Photosynthesis and mineral absorption

Gas Exchange Systems – Gas Exchange System in Humans, Structure and functions, Adaptations for efficient gas exchange, Mechanism of breathing and lung volume measurements, Impact of exercise, asthma, and smoking, Gas Exchange in Plants, Role of leaf stomata

Reproduction – Reproduction in Humans, Structure and function of male and female reproductive systems, Menstrual cycle, gametes, fertilisation, gestation, and birth, Effect of maternal lifestyle on the foetus through the placenta, Reproduction in Plants, Flower structure, pollination, fertilisation, seed and fruit formation, dispersal, Quantitative investigation of dispersal mechanisms

Health – Effects of Recreational Drugs on Behaviour, Health, and Life Processes

Material Cycles and Energy – Photosynthesis, Reactants, products, and word summary, Importance for life on Earth, Leaf adaptations for photosynthesis, Cellular Respiration, Aerobic and anaerobic respiration, Breakdown of organic molecules for life processes, Word summary for aerobic respiration, Anaerobic respiration in humans and micro-organisms, Fermentation and word summary for anaerobic respiration, Differences between aerobic and anaerobic respiration

Interactions and Interdependencies – Relationships in an Ecosystem, Interdependence of organisms, Food webs and insect-pollinated crops, Importance of plant reproduction through insect pollination for food security, Impact of organisms on the environment, including accumulation of toxic materials

Genetics and Evolution – Inheritance, Chromosomes, DNA, and Genes, Process of genetic information transmission, Model of chromosomes, genes, and DNA, Contributions of Watson, Crick, Wilkins, and Franklin to DNA model, Differences between Species, Variation within and between Species, Continuous and discontinuous variation, Measurement and graphical representation of variation, Natural Selection and Evolution, Competition, adaptation, and reproduction, Changes in the environment and extinction, Importance of Biodiversity, Use of gene banks to preserve hereditary material



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Science – Physics

Topics to revise:

Energy

- Calculation of fuel uses and costs in the domestic context
- Comparing energy values of different foods (from labels) (kJ)
- Comparing power ratings of appliances in watts (W, kW)
- Comparing amounts of energy transferred (J, kJ, kW hour)
- Domestic fuel bills, fuel use and costs
- Fuels and energy resources

Energy Changes and Transfers

- Simple machines give bigger force but at the expense of smaller movement (and vice versa): product of force and displacement unchanged
- Heating and thermal equilibrium: temperature difference between 2 objects leading to energy transfer from the hotter to the cooler one, through contact (conduction) or radiation; such transfers tending to reduce the temperature difference; use of insulators
- Other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels

Changes in Systems

- Energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change
- Comparing the starting with the final conditions of a system and describing increases and decreases in the amounts of energy associated with movements, temperatures, changes in positions in a field, in elastic distortions and in chemical compositions
- Using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about such changes

Motion and Forces

- Describing motion
- Speed and the quantitative relationship between average speed, distance and time
- The representation of a journey on a distance-time graph
- Relative motion: trains and cars passing one another
- Forces as pushes or pulls, arising from the interaction between 2 objects
- Using force arrows in diagrams, adding forces in 1 dimension, balanced and unbalanced forces
- Moment as the turning effect of a force
- Forces associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water
- Forces measured in newtons, measurements of stretch or compression as force is changed
- Force-extension linear relation; Hooke's Law as a special case
- Work done and energy changes on deformation
- Non-contact forces: gravity forces acting at a distance on Earth and in space, forces between magnets, and forces due to static electricity

Energy in Matter

- Changes with temperature in motion and spacing of particles
- Internal energy stored in material



Key information:

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Science – Physics

Topics to revise:

Pressure in Fluids

- Atmospheric pressure, decreases with increase of height as weight of air above decreases with height
- Pressure in liquids, increasing with depth; upthrust effects, floating and sinking
- Pressure measured by ratio of force over area – acting normal to any surface

Balanced Forces

- Opposing forces and equilibrium: weight held by stretched spring or supported on a compressed surface

Forces and Motion

- Forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only)
- Change depending on direction of force and its size

Waves

- Observed waves
- Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel – superposition
- Sound waves
- Frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound
- Sound needs a medium to travel, the speed of sound in air, in water, in solids
- Sound produced by vibrations of objects, in loudspeakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal
- The auditory range of humans and animals
- Energy and waves
- Pressure waves transferring energy; use for cleaning and physiotherapy by ultrasound; waves transferring information for conversion to electrical signals by microphone
- Light waves
- The similarities and differences between light waves and waves in matter
- Light waves travelling through a vacuum; speed of light
- The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface
- Use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye
- Light transferring energy from source to absorber, leading to chemical and electrical effects; photosensitive material in the retina and in cameras
- Colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection

Particle Model

- The differences in arrangements, in motion and in closeness of particles explaining changes of state, shape and density; the anomaly of ice-water transition
- Atoms and molecules as particles



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Science – Physics

Topics to revise:

Electricity and Electromagnetism

- Current electricity
- Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge
- Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current
- Differences in resistance between conducting and insulating components (quantitative)
- Static electricity
- Separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects
- The idea of electric field, forces acting across the space between objects not in contact
- Magnetism
- Magnetic poles, attraction and repulsion
- Magnetic fields by plotting with compass, representation by field lines
- Earth's magnetism, compass and navigation
- The magnetic effect of a current, electromagnets, DC motors (principles only)

Matter

- Physical changes
- Conservation of material and of mass, and reversibility, in melting, freezing, evaporation, sublimation, condensation, dissolving
- Similarities and differences, including density differences, between solids, liquids and gases
- Brownian motion in gases
- Diffusion in liquids and gases driven by differences in concentration
- The difference between chemical and physical changes

Space Physics

- Gravity force, weight = mass x gravitational field strength (g), on Earth $g=10 \text{ N/kg}$, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and sun (qualitative only)
- Our sun as a star, other stars in our galaxy, other galaxies
- The seasons and the Earth's tilt, day length at different times of year, in different hemispheres
- The light year as a unit of astronomical distance



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Science – Chemistry

Topics to revise:

The Particulate Nature of Matter

- Properties of different states of matter (solid, liquid, gas) in terms of the particle model, including gas pressure- Changes of state in terms of the particle model

Atoms, Elements, and Compounds

- Simple (Dalton) atomic model- Differences between atoms, elements, and compounds- Chemical symbols and formulae for elements and compounds- Conservation of mass in changes of state and chemical reactions

Pure and Impure Substances

- Concept of a pure substance- Mixtures, including dissolving- Diffusion in terms of the particle model- Simple techniques for separating mixtures: filtration, evaporation, distillation, and chromatography- Identification of pure substances

Chemical Reactions

- Chemical reactions as the rearrangement of atoms- Representing chemical reactions using formulae and equations- Combustion, thermal decomposition, oxidation, and displacement reactions- Defining acids and alkalis in terms of neutralisation reactions- The pH scale for measuring acidity/alkalinity and indicators- Reactions of acids with metals to produce a salt plus hydrogen- Reactions of acids with alkalis to produce a salt plus water- Catalysts and their function, Reactivity series

Energetics

- Energy changes on changes of state (qualitative)- Exothermic and endothermic chemical reactions (qualitative)

The Periodic Table

- Varying physical and chemical properties of different elements- Principles underpinning the Mendeleev periodic table- Periods and groups; metals and non-metals in the periodic table- Predicting patterns in reactions with reference to the periodic table- Properties of metals and non-metals- Chemical properties of metal and non-metal oxides with respect to acidity

Materials

- Order of metals and carbon in the reactivity series- Use of carbon in obtaining metals from metal oxides- Properties of ceramics, polymers, and composites (qualitative)

Earth and Atmosphere

- Composition and structure of the Earth- Rock cycle and formation of igneous, sedimentary, and metamorphic rocks- Earth as a source of limited resources and the efficacy of recycling- Composition of the atmosphere- Production of carbon dioxide by human activity and its impact on climate



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