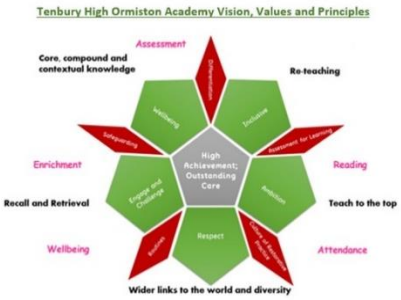
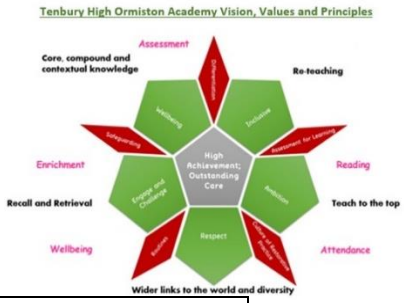
TENBURY HIGH
ORMISTON ACADEMY

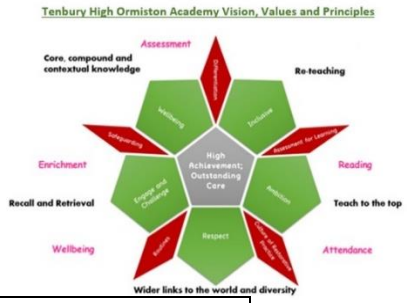


Curriculum Overview for Year 9 Science

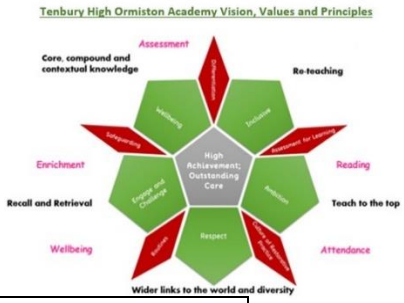
Half Term 5: BOM10 (atomic structure and Periodic table), Bom11 (Energy and the particle model), CR6 (Chromatography and analysis). Substantive Knowledge: ▪ Identify mass and charge of the 3 subatomic particles. ▪ Describe the development of an atom. ▪ Describe the periodic table development. ▪ Describe how ions are formed. ▪ Describe reactions of group 0. ▪ Describe group 1 reactions ▪ Explain group 1 reactions. ▪ Describe reactions of group 7. ▪ Compare group 1 and group 7 elements. ▪ TRIPLE – Compare group 1 and transition metals. ▪ Energy as a quantity that can be calculated. ▪ Internal energy stored in materials. ▪ The total energy has the same value before and after a change. ▪ Temperature and how to measure temperature difference. ▪ 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		Skim and Scan of source information Decoding terms Etymology of key terms
		Alkali metals Atom Atomic nucleus Atomic number Chromatography Compound Crystallisation Displacement Electron Electron shell Element Filtration Fractional distillation Group (periodic table) Halogens Ion Isotope



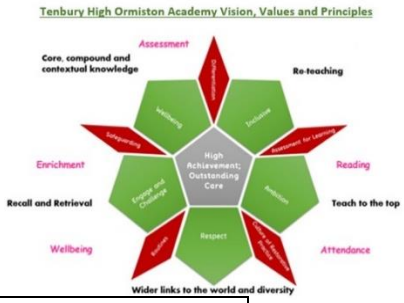
▪ the properties of different states of matter (solid, liquid and gas) in terms of particle model, including gas pressure ▪ the difference between physical and chemical changes ▪ chemical symbols and formulae for elements and compounds ▪ Conservation of materials and mass, reversibility, in melting, freezing, evaporation, sublimation, condensation and dissolving ▪ Similarities and differences, including density differences, between solids, liquids and gases ▪ Brownian motion of gases ▪ The concept of a pure substance ▪ pressure measured by ratio force over area - acting normal to any surface ▪ Describe how we test for pure substances. ▪ Describe the use of formulation. ▪ Identify examples of formulations. ▪ Describe the chromatography required practical. ▪ Explain how paper chromatography separates mixtures ▪ Describe the test for hydrogen. ▪ Describe the test for oxygen ▪ Describe the test for chlorine. ▪ Describe the test for carbon dioxide		Mass number Metals Mixture Neutron Noble gases Non-metals Nuclear model Periodic table Plum pudding model Proton Relative atomic mass Simple distillation Transition metals Aqueous Solution Micrometer Vernier Callipers Resolution Internal Energy Absolute Zero Specific Heat Capacity (SHC)



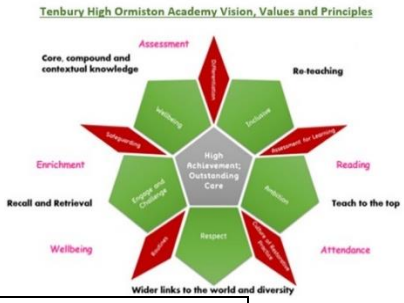
▪ Describe how to test for positive metal ions. (T) ▪ Identify the results for the positive metal ion test. (T) ▪ Describe how to use sodium hydroxide to test for some metal ions. (T) ▪ Identify the results of the sodium hydroxide test. (T) ▪ Describe the test for carbonates. (T) ▪ Describe the test for halides. (T) ▪ Identify the halide test results. (T) ▪ Describe the test for sulfates. (T) ▪ State advantages of instrumental analysis compared to chemical tests. (T) ▪ Describe flame emission spectroscopy. (T) ▪		Specific Latent Heat (SLH) SLH of fusion SLH of vaporisation Chromatogram Chromatography Flame emission spectroscopy Flame test Formulation Impure substance Instrumental methods Litmus paper Mobile phase Precipitation Pure substances Rf value Stationary phase
		End of Unit tests
Disciplinary Knowledge: • Draw and label an atom for the first 20 elements. • Use abstract models when describing processes or phenomena. (WS1.2) • Identify a suitable piece of equipment needed to collect reliable data (WS2d) • Math skills (MS) • Visualize 2D and 3D forms including 2D representations of 3D objects		Revision cards and exam questions. 20 mins per discipline per week.



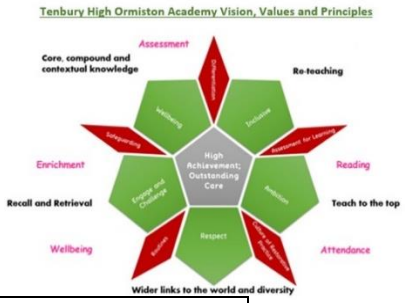
• Calculate areas of triangles, rectangles, surface area and volume of cubes • solve simple algebraic calculations (fifa) • Change the subject of a formula • Calculate Rf values, • Interpret chromatograms • Interpret an instrumental result. (T)		
<u>Half Term 6: OEOO11 (defining force).</u> Substantive Knowledge: ▪ The unit for force is Newtons, and work done is J ▪ Some contact forces are tension, friction, air resistance, upthrust, thrust, normal reaction force. ▪ Some non-contact forces are magnetic force, electrostatic force, gravitational force. ▪ Forces can be represented using arrows. These arrows have both direction and magnitude. ▪ When a force is placed on a material, that material may be stretched or compressed. ▪ Elastic materials will often return to their original shape when the force is removed. ▪ When an object cannot return to its original shape it has deformed ▪ A resultant force is single force ▪ Springs will extend when a force is applied		Skim and Scan of source information Decoding terms Etymology of key terms
		Gravitational Field Strength Elastic Deformation Inelastic Deformation Resultant Force Weight Extension Newton Linear/Directly Proportional Vector Quantity Work Done
		End of unit tests
		



▪ Extension is directly proportional to the force ▪ Represented by a straight line through the origin ▪ When an object cannot return to its original shape it has deformed ▪ Work done is a measured in Joules, J ▪ To do work means to apply a force over a distance ▪ Changes in energy stores can be described. ▪ Work done is the change energy stores due to a process or action taking place. ▪ A system is an object or group of objects. ▪ In closed system the total amount of energy never changes – energy is conserved. ▪ The universe is a closed system. ▪ Chemical, gravitational, kinetic, thermal, and elastic are examples of stores. ▪ There are 4 pathways: Heating by particles, Work (mechanical), electrical working and heating by radiation. ▪ Some energy changes are unwanted or wasted. Disciplinary Knowledge: • Identify data as categoric, discrete or continuous • Select appropriate ways of presenting scientific data – line graphs, bar charts, pie charts etc linked to science (WS3b)		



• Accurately collect data, choosing appropriate ranges, and repeats needed (WS2f) • Identify a suitable piece of equipment needed to collect reliable data (WS2d) • Identify one or more control variables in an investigation (WS2c) • Explain the need to control variables • Use scientific ideas when describing simple processes or phenomena ○ Categorise data as quantitative or qualitative • Suggest improvement to their method without prompts (WS2e) • Construct scientific plans which will allow for reliable results to be collected (Ws2c) • Suggest alternative methods to those provided (WS2e) • Describe observations using cause and effect, identifying sources of zero, random and systematic error • Math skills (MS) • Construct line graphs with given axis • Convert in, and out of standard form • Provide answers to 2 s.f. and express answers in decimal form • Describe patterns and trends in given data		



• calculate areas of triangles, rectangles, surface area and volume of cubes • solve simple algebraic calculations • Use angular measurements • Change the subject of a formula • Construct line graphs from given data • Translate data between graphical and numerical form		