



SCIENCE CURRICULUM MAP

YEAR 7

HALF TERM 1: <u>BOM5 - The particle model</u> 1. The differences in arrangements, in motion and in closeness of particles explaining changes of state, shape and density, the anomaly of ice water transition 2. Atoms and molecules as particles 3. The properties of different states of matter (solid, liquid and gas) in terms of particle model, including gas pressure 4. The difference between physical and chemical changes <u>OEOO4 - Changing shape</u> 1. Forces measured in Newtons 2. Forces as pushes or pulls, arising from the interaction between objects: Contact forces and non-contact forces. 3. Non-contact forces: gravity forces acting at a distance on earth and in space. 4. Single forces. Draw for contact and non-contact, including magnetism. 5. Using force arrows in diagrams to show each force acting upon an object. 6. Balanced forces and equilibrium; weight held by stretched spring or supported on compressed surfaces. 7. Measurements of stretching or compression as force is changed.		Supporting texts or wider reading BOM5 – The particle model - Father-son bond inspires sweets that model the shapes of molecules by Carmen Drahl OEOO4 – Changing shape - Short Extract from Dead Famous – Isaac Newton and his Apple
		Opportunities for extended writing Pre- diagnostic test Post- diagnostic tests Explaining the differences of chemical and physical changes. Differentiation between elastic and inelastic materials.
		Speak like an expert Discussing the key word ‘model’ why are models used. Why we use models such as spheres when representing particles. Using key words provided at the start of each topic.
		Links to careers, personal development and other subject areas. Careers focus – OEOO4 – Construction BOM5 – Chemical engineering. Maths focus – Calculating weight using an equation. Maths – Using the key term ‘anomaly’ .
HALF TERM 2: <u>BBL1 – Animal cells</u> 1. The function of the cell membrane, cytoplasm, nucleus and mitochondria 2. The hierarchical organisation of multicellular organisms: from cells to tissue to organs to systems to organisms 3. Cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope 4. The structure and function of the human skeleton, to include support, protection, movement and making blood cells 5. Biomechanics - the interaction between skeleton and muscles, including the measurement of force exerted by different muscle groups 6. The function of muscles and examples of antagonistic muscles <u>BOM6 – The Atom</u> 1. A simple (Dalton) atomic model 2. Difference between atoms, elements and compounds		Supporting texts or wider reading BBL1- A brief history of Robert Hooke BOM6 - Short Extract from Bill Bryson’s ‘A Brief History of Nearly Everything’
		Opportunities for extended writing Pre- diagnostic test. Post -diagnostic test. Pre Reading tasks with extended answers – To develop oracy. Extended response answer on the function of the skeleton.
		Speak like an expert Group work on the ‘Skeleton’. What would life be like without a Skeleton? Class discussion of human/ animal reproduction. Explaining the difference between atoms, compounds and elements. Using key words provided at the start of each topic.



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- Chemical symbols and formulae for elements and compounds - Conservation of mass changes of state and chemical reactions		Links to careers, personal development and other subject areas. PE – Structure and function of the human skeleton, to include support, protection, movement. Links to the circulatory system PSHE – life process of reproduction in humans Careers – Links to medical science and nuclear energy.
HALF TERM 3: BE3 – Astrophysics - Our Sun as a star, other stars in the galaxy and other galaxies - The light-year as an astronomical value - The objects that can be observed in the night sky; objects that can be observed by telescopes - Gravity force = weight x gravitational field strength, different on other planets and stars; gravity forces between Earth and Moon and between Earth and Sun - The seasons and Earth's tilt, day length at different times of the year, in different hemispheres BOM7 – Changes of State - 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 - Diffusion in terms of particle model - Diffusion in liquids and gases by differences in concentration		Supporting texts or wider reading BOM7 - Short Extract from US History: The Titanic BE3 - You might not come back alive' A CNN business interview with Elon Musk, 27th April 2021 Opportunities for extended writing Writing experimental methods of using the different separating techniques. A letter from space describing 'A journey through the solar system and beyond into the rest of the Milky Way and the Universe'. Speak like an expert Discussions on the seasons of the year, Galaxies and life beyond our planet. Explaining each change of state and be able to articulate what 'Brownian motion' is. Using key words provided at the start of each topic. Links to careers, personal development and other subject areas. Careers – focus on astronomy and material science. Maths calculations - Gravity force = weight x gravitational field strength
HALF TERM 4: THB7 – The breathing system - The structure and functions of the gas exchange systems in humans, including adaptations to function - The role of diffusion in the movement of materials		Supporting texts or wider reading THB7 - The lady with the Iron Lung Article from NPR.org – 25th Oct 2021 CR3 – Booklet on Chemical Reactions.



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3. The mechanism of breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases, including simple measurements of lung volume CR3 – Types of reactions 1. chemical reactions as the rearrangement of atoms 2. representing chemical reactions using formulae and using equations 3. combustion, thermal decomposition, oxidation and displacement reactions 4. Word equations		Opportunities for extended writing Answering guided reading task questions on the iron lung. Explaining what happens in displacement reactions.
HALF TERM 5: OE3 – The cycles 1. the composition of the earth 2. the structure of the earth 3. the rock cycle and the formation of igneous, sedimentary and metamorphic rocks 4. Water cycle (First introduced in BOM3) 5. Water poverty and how it's being addressed BBL2 – Human reproduction 1. Reproduction in humans (as an example of a mammal) including the structure and function of the male and female reproductive systems and gametes. 2. The menstrual cycle (without details of hormones) 3. Fertilisation, gestation and birth, to include the role of the placenta.		Speak like an expert. Group work and presentation on “the Earth in space” relating to seasons and day and night. Pupils produce a presentation and use props to show how we get seasons and day and night.
		Links to careers, personal development and other subject areas. Geography – structure of the earth and plate tectonics. Maths - calculating weight from mass and gravitational field strength. Calculating balanced forces.
		Supporting texts or wider reading. OE3 - Short Extract from Indonesia Earthquake and Tsunami Survivor Story: Marzela’s Story BBL2 – Dudley Zoo ‘Baby Sloths’.
HALF TERM 6: THB8 – Health and Disease		Opportunities for extended writing Extended writing task ‘The journey from Zygote to Baby’ How can we address water poverty in other countries.
		Speak like an expert. Discussing human reproduction and the difference to plant reproduction. What possible disadvantages could asexual reproduction have. How the different types of rock are formed and what processes they have to go through.
		Links to careers, personal development and other subject areas. PSHE – Reproduction Health and Social Care – How the baby develops. Art – Drawing different types of rocks within the rock cycle. Geography – The Rock cycle.
		Supporting texts or wider reading. The effects global warming has on the Earth.



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1. The structural adaptations of some unicellular organisms 2. The effects of recreational drugs (including substance misuse) on behaviour, health and life processes 3. The impact of exercise, asthma and smoking on the human gas exchange system 4. The effect of maternal lifestyle on the foetus through placenta		BE4 - 'You might not come back alive' A CNN business interview with Elon Musk, 27th April 2021 THB8 - Extract from Biomed Science Journal for Teens 'Why are people more likely to get sick when it is cold'?
<u>BOM8 – Purity</u> 1. The concept of a pure substance 2. Mixtures, including dissolving 3. Simple techniques for separating mixtures; filtration, evaporation, distillation and chromatography 4. The identification of pure substances		Opportunities for extended writing Extended writing task on the - The effect of the mother's lifestyle on a baby. The effects of different types of drug within the body.
		Speak like an expert The discussion of the use of recreational drugs on lifestyle. Discussion of Alien conspiracy theories.
<u>BE4 – The space Race</u> 1. The early history of space exploration – why mankind looked to the sky and the first satellites 2. The Space Race, how this led to humans in space and humans on the moon Diversity in the space industry 3. Space exploration in the present day and the future plans for space exploration 4. Science Fact Vs Science Fiction: The impact of popular culture in science 5. Aliens – Conspiracy theories and scientific thought.		Links to careers, personal development and other subject areas. Maths – calculating the mean, sampling, estimating. Technology – The technology uses to filter or dissolve objects. Engineering – how communities are structured. Careers – Focus GP practitioners.