



# ARAB UNITY SCHOOL

CURRICULUM OVERVIEW

SCIENCE - YEAR 7

2019 - 2020

A guide for Parents and Students

Overview of the year: 2019-2020

The national curriculum for science aims to ensure that all pupils develop scientific knowledge and conceptual understanding through the specific disciplines of Science.

- **Biology** – Structure and Function of Living Organisms: Gas Exchange System, Cells & Organisms, Nutrition & Digestion, Enzymes, Role of Bacteria, Plant Reproduction, Human Reproduction.
- **Chemistry** - Pure and impure substances, Atoms, elements and compounds: Chemical Reactions.
- **Physics** – Forces and motion: Discovering forces, Speed calculation, Calculating moments.
- **Working Scientifically** – Understanding of the nature, processes and methods of science through different types of science enquiries to answer scientific questions related to daily life.

<p><b>TERM ONE</b></p> <p>Main topic, skills and content:</p>	<ul style="list-style-type: none"> <li>• <b>Pure and Impure Substances:</b> Mixing, Dissolving and Separation – Explain the concept of pure substances. Describe simple techniques for separating mixtures: filtration, evaporation, distillation</li> <li>• <b>Structure and function of Living Organisms:</b> Respiration &amp; Gas Exchange System – Describe the structure and function of gas exchange system in humans.</li> </ul>	<p><b>SECRET</b></p> <p><b>BYOD – Desalinization method to purify water in UAE</b>  <a href="https://en.wikipedia.org/wiki/Desalination">https://en.wikipedia.org/wiki/Desalination</a></p> <p><b>BYOD – Research and find out Respiratory diseases in humans</b>  <a href="https://www.livescience.com/52250-lung.html">https://www.livescience.com/52250-lung.html</a></p>	<p><b>Common site for Science</b>  <a href="https://www.bbc.co.uk">https://www.bbc.co.uk</a>  <a href="https://www.teachitscience.co.uk/KS3.Science">https://www.teachitscience.co.uk/KS3.Science</a>  <a href="http://links4science.blogspot.com">http://links4science.blogspot.com</a>  <a href="https://www.tes.com">https://www.tes.com</a></p>
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	<p>Explain 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.</p> <p>State the difference between respiration and breathing.</p> <ul style="list-style-type: none"> <li> <b>Forces and Motion:</b>            Discovering Forces, Mass and Weight, Friction, Hooke’s Law, Speed Calculations, Discovering Moments – Differentiate between Mass and weight.            Explain contact and non-contact forces and give their examples.            Use arrows in diagrams to denote forces, adding forces in 1 dimension, balanced and unbalanced forces.            Describe and calculate moments as the turning effect of force.         </li> <li> <b>Structure and function of Living Organisms:</b>            Cells and Organisms – Describe cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope.         </li> </ul>	<p><b>Research</b> (Self Manager, Effective organizer, BYOD)</p> <p>Explore why gravity on the gas planet Saturn is less than that on Earth even though it is more than ten times the diameter.  <a href="https://solarsystem.nasa.gov/planets/saturn/in-depth/">https://solarsystem.nasa.gov/planets/saturn/in-depth/</a></p>	<p><b>Curricular test-</b>            Unit forces, pure and impure substance, structure and function of living organism- Gas Exchange system  <b>Date: 20-24<sup>th</sup> October</b></p> <p><b>Formative Assessment 2 –</b>            Interpreting and analyzing data – Properties of metals &amp; Non-metals  <b>Nov 3<sup>rd</sup> -6<sup>th</sup></b></p>
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	<p>State the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts.</p> <p>Compare plant and animal cells.</p> <p>Explain the role of diffusion in the movement of materials in and between cells.</p> <p>Describe the structural adaptations of some unicellular organisms.</p> <p>Discuss the hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms</p> <p>• <b>Atoms, Elements and Compounds:</b> Periodic Table, Metals and Non-metals</p> <p>Describe the varying physical and chemical properties of different elements.</p> <p>State the principles underpinning the Mendeleev periodic table: periods and groups.</p> <p>State the properties of metals and non-metals.</p>		<p><b>Winter exam</b></p> <p><b>Units:</b> All units covered in Term 1.</p> <p><b>Date:</b> 17-21 November</p>
<p><b>TERM TWO</b></p>	<p>• <b>Structure and function of Living Organisms:</b> Nutrition and Digestion, Enzymes, Role of Bacteria</p>	<p><b>Research work</b> (BYOD, Effective organizer, Reflective Learner)</p> <p><b>Dieting in adolescence</b></p> <p><a href="http://apps.searo.who.int/pds_docs/B0239.pdf">http://apps.searo.who.int/pds_docs/B0239.pdf</a></p>	<p><b>Formative assessment 1:</b></p> <p>Nutrition and digestion –</p>

<p>Main topic, skills and content:</p>	<p>State the content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed. Calculate the energy requirements in a healthy daily diet. Explore the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases. Describe the tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts).</p> <ul style="list-style-type: none"> <li>• <b>Energy:</b> Types of Energy, Energy Transfers</li> </ul> <p>Recognize what energy is and its unit; Describe a range of energy transfers using simple diagrams. Recognize energy transfers due to falling object. Describe different situations that use the energy stored in compressing and stretching elastic materials.</p>	<p>The research work on Diet requirements during adolescence</p> <p>Assessed based on information gathered on</p> <p>Definition of dieting.</p> <p>b) Risk factors of dieting</p> <p>C)Consequences of dieting</p> <p><b>Independent learning</b> (Self manager, BYOD, Reflective learner)</p> <p>Research and presentation of role of bacteria in digestive system</p> <p><a href="https://www.anl.gov/article/exploring-the-role-of-gut-bacteria-in-digestion">https://www.anl.gov/article/exploring-the-role-of-gut-bacteria-in-digestion</a></p> <p>Assessed based on their presentation in the class</p>	<p>Interpretation</p> <p>Jan 26-30</p> <p>Curricular test:</p> <p>Topic: Nutrition and digestion, energy, chemical reactions and investigating carbonates</p> <p>Feb 9-13</p>
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	<p>Describe how elastic potential energy in different materials can be compared; explain how elastic potential energy is transferred.</p> <p>• <b>Atoms, Elements and Compounds:</b> Chemical Reactions, Investigating Carbonates        Make observations during chemical reactions; write word equations to demonstrate chemical changes; explain chemical changes using a model.        Describe oxidation; Recognize the effects of oxidation; use data to support conclusions.        Describe the composition and uses of carbonate compounds; Recognize and explain thermal decomposition reaction.</p> <p>• <b>Pure and Impure Substances:</b>        Chromatography – Use chromatography to identify unknown substances; draw conclusions from evidence.</p>	<p>BYOD        Uses of chromatography in daily life  <a href="https://www.news-medical.net/life-sciences/Life-Science-Applications-of-Chromatography.aspx">https://www.news-medical.net/life-sciences/Life-Science-Applications-of-Chromatography.aspx</a></p>	<p>Formative assessment:        Topic: Difference between heat and temperature, fuels        Date: 25<sup>th</sup> march</p>
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	<ul style="list-style-type: none"> <li> <b>Energy:</b> Difference between Heat and Temperature, Fuels            Explain 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.            Identify examples of fuels and their uses; Describe combustion of fuels and recognize that different fuels transfer different amounts of energy; Describe the advantages and disadvantages of using different fuels.         </li> </ul>	<p>Team worker, Effective organizer, Reflective learner, BYOD)</p> <p>Documentary video – Types of fuels found in UAE and their advantages and disadvantages</p> <p>Assessed based on the information gathered, presentation</p>	
<p><b>TERM THREE</b></p> <p>Main topic, skills and content:</p>	<ul style="list-style-type: none"> <li> <b>Structure and function of Living Organisms:</b>            Plant Reproduction            Describe and explain reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation.            Describe seed dispersal, including quantitative investigation of some dispersal mechanisms.         </li> <li> <b>Atoms, Elements and Compounds:</b> Mass         </li> </ul>		<p>Formative assessment:            Plant reproduction            Date: 26<sup>th</sup> April</p>

	<p>Change in Chemical Reactions – Explain conservation of mass changes of state and chemical reactions.</p> <p>• <b>Waves:</b> Exploring Sound, Speed of Sound, How Sound Travels, Reflection and Absorption of Sounds, Ultrasound, Infrasound –</p> <p>Identify how sounds are made; describe how sound waves transfer energy; explain how loud and quiet sounds are made.</p> <p>Describe frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound.</p> <p>Explain why sound needs a medium to travel, compare the speed of sound in air, in water, in solids.</p> <p>Describe sound produced by vibrations of objects, in loudspeakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal.</p>	<p><b>Independent Research</b> (Self manager, Reflective learner, BYOD)</p> <p>Ultrasound waves are used in medical field. Why do you think so and what are their significance?</p> <p><a href="https://en.wikipedia.org/wiki/Medical_ultrasound">https://en.wikipedia.org/wiki/Medical_ultrasound</a></p>	<p><b>Internal assessment:</b> Waves Dates: 17<sup>th</sup> May</p> <p><b>Final exam:</b> All the topics Dates: May 31-4<sup>th</sup> June</p>
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