

**Dawood Public School**  
**Course Outline 2018-19**  
**General Science**  
**Class VIII**

<b>Months</b>	<b>Syllabus Break down</b>	<b>Reference Book</b>
<b>August</b>	<b>Solutions (Acids and Alkalis)</b>	<b>International Lower Secondary Science Book 2 Chapter 05</b>
	<b>Periodic Table</b>	<b>Chemistry Matters Chapter 16</b>
<b>September</b>	<b>Magnetism</b>	<b>International Lower Secondary Science Book 3 Chapter 12</b>
	<b>Respiration and Circulation</b>	<b>International Lower Secondary Science Book 3 Chapter 02</b>
<b>October</b>	<b>Heating and Cooling</b>	<b>International Lower Secondary Science Book 3 Chapter 09</b>
	<b>Ecology</b>	<b>International Lower Secondary Science Book 3 Chapter 04</b>
<b>November</b>	<b>Revision</b>	<b>Work Sheets</b>
<b>December</b>	<b>Mid Term</b>	
<b>January</b>	<b>Food Chain and Food Web</b>	<b>International Lower Secondary Science Book 3 Chapter 05</b>
	<b>Sound and Hearing</b>	<b>International Lower Secondary Science Book 3 Chapter 11</b>
<b>February</b>	<b>Writing and Balancing Equations</b>	<b>Hand out</b>
	<b>Light</b>	<b>International Lower Secondary Science Book 3 Chapter 10</b>
<b>March</b>	<b>Light</b>	<b>International Lower Secondary Science Book 3 Chapter 10</b>
	<b>Man's Impact on Ecosystem</b>	<b>International Lower Secondary Science Book 3 Chapter 06</b>
<b>April</b>	<b>Revision</b>	<b>Work Sheets</b>
<b>May</b>	<b>Final Term</b>	

**Topic: Acids and Alkalis (International Lower Secondary Science Book 2)**

<b>Contents</b>	<b>Learning Outcomes</b>
5.3. Acids and Alkalis Acids	<ul style="list-style-type: none"><li>• Define acids.</li><li>• State the physical properties of acids.</li><li>• State the chemical reactions of acids.</li><li>• Predict the effect of CO<sub>2</sub> on lime water.</li><li>• Predict the effect of H<sub>2</sub> gas on burning splint.</li><li>• State the uses of acids with examples.</li></ul>
Alkalis	<ul style="list-style-type: none"><li>• Define alkalis.</li><li>• State the properties of alkalis.</li><li>• State the uses of alkalis with examples.</li></ul>
pH and pH scale Indicators	<ul style="list-style-type: none"><li>• Define pH.</li><li>• Identify acidity or alkalinity of a solution using a pH scale.</li><li>• Define indicators.</li><li>• List examples of indicators.</li><li>• Identify pH of different acidic or alkaline solutions by using Universal indicator.</li><li>• State the equation for neutralization reaction between acids and alkalis.</li><li>• Explain the application of neutralization reaction.</li></ul>
<p><b>Key Words:</b> acids, alkalis, pH, sour taste, corrosive, bitter taste, pH scale, neutralization, lime water, acidic pH, alkaline pH, neutral point, indicator and litmus.</p> <p><b>Types of Questions:</b></p> <ul style="list-style-type: none"><li>• Multiple choice questions.</li><li>• Structured questions.</li><li>• Short answer reasoning.</li><li>• Descriptive questions.</li><li>• Writing equations of chemical reactions.</li></ul> <p><b>Work book Activities:</b> Activity 5.3, 5.4 and 5.5 from International Lower Secondary Science Work Book 2.</p> <p><b>Activities/ Experiments:</b></p> <ul style="list-style-type: none"><li>• Identify unknown substances as acids or alkalis using litmus paper.</li><li>• Use Coca Cola as a source of acid for removing stains.</li><li>• Test for properties of alkalis; observations to be recorded while using:<ul style="list-style-type: none"><li>➤ detergent</li><li>➤ soap</li><li>➤ shampoo</li><li>➤ toothpaste</li></ul></li><li>• Perform an experiment to show CO<sub>2</sub> is released during a chemical reaction between dilute acid for example vinegar and bicarbonate for example baking soda.</li></ul> <p><b>Surf IT:</b> <a href="https://www.youtube.com/watch?v=1eePYyq2a6U">https://www.youtube.com/watch?v=1eePYyq2a6U</a> <a href="https://www.youtube.com/watch?v=Rp4cki_eZhk">https://www.youtube.com/watch?v=Rp4cki_eZhk</a></p>	

**Topic: The Periodic Table (Chemistry Matters)**

<b>Contents</b>	<b>Learning Outcomes</b>
16.1. Features of the Periodic Table	<ul style="list-style-type: none"><li>• Identify the correct placement of an element in the Periodic table on the basis of its atomic number.</li><li>• Draw the atomic structure and write down the electronic configuration of first twenty elements.</li><li>• Find out the number of protons/neutrons/nucleon/electron from the given structure or configuration.</li><li>• Find out the valency of an element or ion from its atomic number or electronic configuration.</li></ul>
16.2. Periodic Trends  Metallic and Non- metallic Characteristics	<ul style="list-style-type: none"><li>• State reason for the change in metallic to non-metallic characteristics of elements from the left to right of the Periodic Table.</li><li>• Differentiate between metals and non metals with examples.</li><li>• Define metalloids with examples.</li><li>• Describe and illustrate the formation of metal ion/s by the loss of electron/s.</li><li>• Describe and illustrate the formation of non-metal ion/s by the gain of electron/s.</li><li>• Define ionic compounds with examples.</li><li>• Define covalent compounds with examples.</li><li>• Identify covalent compounds and ionic compounds by the formulae.</li></ul>
16.3. Group I Elements- Alkali Metals	<ul style="list-style-type: none"><li>• Define alkali metals with examples.</li><li>• State the physical properties of alkali metals.</li><li>• State the chemical properties of alkali metals with chemical equations.</li></ul>
16.4. Group VII Elements-Halogens	<ul style="list-style-type: none"><li>• Define halogens with examples.</li><li>• State the physical properties of halogens.</li><li>• State and describe the displacement reactions of halogens.</li></ul>
16.3. Group 0 Elements-Noble Gases	<ul style="list-style-type: none"><li>• Explain why group VIII elements are called noble gases.</li><li>• State the uses of noble gases in our daily life.</li></ul>
Transition Elements	<ul style="list-style-type: none"><li>• List the names of some transition elements.</li><li>• State the properties of transition elements.</li></ul>
<p><b>Key Words:</b> atoms, element, atomic structure, electronic configuration, atomic number, nucleon number, groups, periods, reactivity, flame test, displacement reaction, mono atomic, inert, catalyst.</p> <p><b>Types of Questions:</b></p> <ul style="list-style-type: none"><li>• Multiple choice questions.</li><li>• Structured questions.</li><li>• Short answer reasoning.</li><li>• Descriptive questions.</li><li>• Writing equations of chemical reactions.</li><li>• Drawing structures of atoms/ions.</li></ul> <p><b>Activities/ Experiments:</b></p> <ul style="list-style-type: none"><li>• Game of periodic table</li><li>• Power point presentation on properties of alkali metals and halogens.</li></ul> <p><b>Surf IT:</b> <a href="https://www.youtube.com/watch?v=I8tOtZKpi04">https://www.youtube.com/watch?v=I8tOtZKpi04</a> <a href="https://www.youtube.com/watch?v=rBhMWpyO7Ts">https://www.youtube.com/watch?v=rBhMWpyO7Ts</a> <a href="https://www.youtube.com/watch?v=QNojS6ZZ4og">https://www.youtube.com/watch?v=QNojS6ZZ4og</a></p>	

**Topic: Magnetism (International Lower Secondary Science Book 3)**

Contents	Learning Outcomes
12.1 Magnets and the magnetic materials	<ul style="list-style-type: none"> <li>• Define magnets.</li> <li>• Differentiate between magnetic and non magnetic materials with examples.</li> <li>• State the properties of magnets.</li> <li>• Explain why repulsion, not attraction, is the test for magnet.</li> <li>• Identify the poles of a magnet.</li> </ul>
12.2 Making a Magnet Magnetising by stroke method Magnetising by the electrical method	<ul style="list-style-type: none"> <li>• Describe the process of making a magnet using stroke method.</li> <li>• Describe the process of making a magnet using electrical method.</li> <li>• Define electromagnets.</li> <li>• Identify the factors that affect the strength of an electromagnet.</li> </ul>
12.3 Magnetic Field Wires carrying electric current produce magnetic field	<ul style="list-style-type: none"> <li>• Define magnetic field.</li> <li>• Determine that magnetic field always arises from the North pole.</li> <li>• Recognize that magnetic field lines can show the direction of magnetic field</li> <li>• Compare the magnetic fields of small and large size magnet by using iron filings.</li> <li>• Describe how a magnetic field is set up when a current flows through a wire or coil.</li> <li>• Plot a compass corresponding to the direction of the magnetic field.</li> <li>• Describe the magnetic effect of a current while making a compass for navigation.</li> </ul>
12.4 Uses of Magnets	<ul style="list-style-type: none"> <li>• Discuss the uses of magnets and electromagnets in industries and home for example; electric bell, lifting heavy objects, bullet train etc.</li> <li>• Explain the working of electric bell.</li> </ul>
<p><b>Key Words:</b> magnetite, lodestone, ferrite, alnico, North seeking pole, South seeking pole, magnetic force of attraction, magnetic field, stroking, electromagnet, temporary magnet, permanent magnet, magnetic field.</p> <p><b>Types of Questions:</b></p> <ul style="list-style-type: none"> <li>• Multiple choice questions.</li> <li>• Structured questions.</li> <li>• Short answer reasoning.</li> <li>• Descriptive questions.</li> <li>• Drawing of magnetic line of forces.</li> </ul> <p><b>Work book Activities:</b> Work book activities 12.1, 12.2, 12.3, 12.4, 12.5, 12.6, 12.7, 12.8 and 12.9.</p> <p><b>Activities/ Experiments:</b></p> <ul style="list-style-type: none"> <li>• Separating a non-magnetic material from a magnetic material using a magnet.</li> <li>• Observe that a magnet can be distinguished from magnetic materials because it shows repulsion to any one pole of a magnet.</li> <li>• Use the stroke method to magnetise an iron nail. Try using the magnetized iron nail to pick up some pins.</li> </ul> <p><b>Surf IT:</b> <a href="https://www.youtube.com/watch?v=T8aoHwcN02M">https://www.youtube.com/watch?v=T8aoHwcN02M</a> <a href="https://www.youtube.com/watch?v=Kx7FwUue87w">https://www.youtube.com/watch?v=Kx7FwUue87w</a></p>	

**Topic: Respiration and Circulation (International Lower Secondary Science Book 3)**

Contents	Learning Outcomes
<p>2.1. Respiration and Breathing</p> <p>Respiration</p> <p>Breathing</p>	<ul style="list-style-type: none"> <li>• Define respiration.</li> <li>• State the use of energy produced as a result of respiration.</li> <li>• Define and differentiate between aerobic respiration and anaerobic respiration.</li> <li>• State the chemical equation of aerobic respiration and anaerobic respiration.</li> <li>• Discuss the importance of fermentation industrially and state the chemical equation of fermentation.</li> <li>• Define breathing.</li> <li>• Compare the composition of inhaled air and exhaled air.</li> <li>• Differentiate between breathing and respiration.</li> <li>• Identify the organs of respiratory system.</li> <li>• Explain the working of respiratory system during inhalation and exhalation.</li> <li>• Explain the structural and function adaptations of trachea.</li> <li>• Relate the adaptation of alveoli to the quick and efficient exchange of gases.</li> <li>• Describe the causes and effects of the following diseases on the human body:               <ul style="list-style-type: none"> <li>➤ Asthma</li> <li>➤ Bronchitis</li> <li>➤ Emphysema</li> <li>➤ Lung Cancer</li> </ul> </li> </ul>
<p>2.2. Transport in human beings</p> <p>Heart</p> <p>Blood Vessels</p> <p>Blood</p> <p>Circulation of Blood</p>	<ul style="list-style-type: none"> <li>• Compare the transport system in man with the transport system of a city.</li> <li>• Label the structure of heart.</li> <li>• Explain what is meant by double circulation.</li> <li>• Draw a flow chart to illustrate double circulation by the human heart including the valves and main vessels.</li> <li>• Describe in detail blood flow in the human heart.</li> <li>• Compare the properties, functions and adaptations of arteries and veins.</li> <li>• Relate the structure of capillaries to its function of exchange of substances.</li> <li>• Describe the formation and function of tissue fluid.</li> <li>• Elaborate the importance of blood in the circulatory system.</li> <li>• Identify the organs of respiratory system.</li> <li>• Describe the main components of blood.</li> <li>• State the function of blood.</li> <li>• Relate the adaptation of blood cells with its functions.</li> <li>• Differentiate between blood plasma and tissue fluid.</li> <li>• Identify and name the blood vessels that carry blood to and from the respective organs of the body.</li> <li>• Explain what is meant by coronary heart diseases.</li> </ul>
<p><b>Key Words:</b> aerobic respiration, anaerobic respiration, fermentation, breathing, inhalation, exhalation, diffusion, diaphragm, intercostals muscles, ciliated epithelial cells, valves, plasma, tissue fluid, centrifugation.</p> <p><b>Types of Questions:</b></p> <ul style="list-style-type: none"> <li>• Multiple choice questions.</li> <li>• Structured questions.</li> <li>• Labeling</li> <li>• Short answer reasoning.</li> </ul>	

- Descriptive questions.
- Drawing of flow chart to show blood circulation in human heart.

**Work book Activities:**

Work book activities 2.1, 2.2, 2.3.

**Activities/ Experiments:**

- Physical exercise for 5 minutes and records their observations before and after exercise.
- Inhale and exhale practice with noticing the changes in the position of diaphragm.
- Audiovisual presentation

**Surf IT:**

<https://www.youtube.com/watch?v=oHMmtqKgs50>

<https://www.youtube.com/watch?v=q0s-1MC1hcE>

**Topic: Heating and Cooling (International Lower Secondary Science Book 3)**

Contents	Learning Outcomes
<p>9.1 Temperature and Heat</p> <p>Thermometer</p> <p>Upper fixed (steam) point and Lower fixed (ice) point</p> <p>Sensitivity and Range</p>	<ul style="list-style-type: none"> <li>• Differentiate between heat and temperature.</li> <li>• Define thermometer.</li> <li>• Differentiate between clinical thermometer and laboratory thermometer.</li> <li>• Define upper fixed point / boiling point of water.</li> <li>• Define lower fixed point / freezing point of water.</li> <li>• Define sensitivity of a thermometer.</li> <li>• Define range of a thermometer.</li> <li>• Calculate the range of a thermometer.</li> </ul>
<p>9.2. Effect of heat gain and heat loss (in terms of particle model of matter).</p> <p>Change in Volume</p> <p>Thermal expansion and contraction of solids</p> <p>Thermal expansion and contraction of liquids</p> <p>Thermal expansion and contraction of gases</p> <p>Effect of thermal expansion and contraction</p> <p>Application of thermal expansion and contraction</p>	<ul style="list-style-type: none"> <li>• Define the following terms: <ul style="list-style-type: none"> <li>➤ Melting</li> <li>➤ Boiling</li> <li>➤ Freezing</li> <li>➤ Condensation</li> <li>➤ Sublimation</li> <li>➤ Evaporation</li> </ul> </li> <li>• Describe the change of state in terms of particle model of matter.</li> <li>• Label the heating curve and cooling curve of water.</li> <li>• Explain the following factors affecting evaporation: <ul style="list-style-type: none"> <li>➤ Temperature</li> <li>➤ Surface area</li> </ul> </li> <li>• Describe the change in volume of an object as an effect of heat gain (expansion) and heat loss (contraction) in terms of particle model of matter.</li> <li>• Explain thermal expansion and contraction of solids with the example of bimetallic strip.</li> <li>• Explain thermal expansion and contraction of liquid with the example of thermometer.</li> <li>• Explain thermal expansion and contraction of gases with the example of rising of dough, hot air balloon, CNG kit, cold drink cans.</li> <li>• Discuss the problems caused by thermal expansion and contraction in our daily life and explain how they may be overcome in case of the following: <ul style="list-style-type: none"> <li>➤ Concrete road surfaces or pathways</li> <li>➤ Railway tracks</li> <li>➤ Overhead power and telephone line</li> <li>➤ Bridges</li> <li>➤ Glass</li> </ul> </li> <li>• Describe various appliances/processes from daily life which work on the principle of expansion and contraction. For examples: <ul style="list-style-type: none"> <li>➤ Riveting</li> <li>➤ Wheel and axle</li> <li>➤ Thermometers</li> <li>➤ Thermostat</li> <li>➤ Hot air balloon</li> <li>➤ Land breeze/Sea breeze</li> </ul> </li> </ul>

<p>9.3. Transfer of Heat</p> <p>Conduction</p> <p>Convection</p> <p>Radiation</p> <p>Dull/Rough surfaces</p> <p>Silver, Shiny/ Smooth surfaces</p>	<ul style="list-style-type: none"> <li>• Define the methods of heat transfer: <ul style="list-style-type: none"> <li>➤ Conduction</li> <li>➤ Convection</li> <li>➤ Radiation.</li> </ul> </li> <li>• Differentiate between conductors and insulators.</li> <li>• Elaborate the principle of conduction to make use of conductors and insulators.</li> <li>• Describe and illustrate the establishment of convection current by drawing arrows in given diagrams.</li> <li>• Elaborate the principle of convection to explain natural phenomena and the working of different appliances/ technologies.</li> <li>• Compare the process of radiation with conduction and convection.</li> <li>• Relate the properties of rough and smooth surfaces with their uses in our daily life.</li> <li>• Identify the type of surface used under different given conditions.</li> </ul>
<p><b>Key Words:</b></p> <p>heat, temperature, upper and lower fixed point, sensitivity, range, constriction, bore size, kinetic energy, coolness, vibrations, expansion, contraction, volume, rivet, thermostat, bimetallic strip, conductors, insulators, convection, convection current, radiation, vacuum.</p> <p><b>Types of Questions:</b></p> <ul style="list-style-type: none"> <li>• Multiple choice questions.</li> <li>• Structured questions.</li> <li>• Short answer reasoning.</li> <li>• Descriptive questions.</li> <li>• Diagram based questions.</li> </ul> <p><b>Work book Activities:</b></p> <p>Work book activities 9.1, 9.2, 9.3, 9.4, 9.5, 9.7 and 9.8.</p> <p><b>Activities/ Experiments:</b></p> <ul style="list-style-type: none"> <li>• Students will observe the expansion and contraction of mercury in a glass thermometer.</li> <li>• Students will observe how mixing warm water with cold water can show how heat travels from higher temperature to lower temperature.</li> </ul> <p><b>Surf IT:</b></p> <p><a href="https://www.youtube.com/watch?v=EwzkYtHFbo">https://www.youtube.com/watch?v=EwzkYtHFbo</a></p> <p><a href="https://www.youtube.com/watch?v=21CR01rlmv4">https://www.youtube.com/watch?v=21CR01rlmv4</a></p> <p><a href="https://www.youtube.com/watch?v=Atnjo7dD_bA">https://www.youtube.com/watch?v=Atnjo7dD_bA</a></p> <p><a href="https://www.youtube.com/watch?v=gcY6832h_Nw">https://www.youtube.com/watch?v=gcY6832h_Nw</a></p> <p><a href="https://www.youtube.com/watch?v=EkQ2886Sxpg">https://www.youtube.com/watch?v=EkQ2886Sxpg</a></p>	

**Topic: Ecology (International Lower Secondary Science Book 3)**

Contents	Learning Outcomes
4.3.Ecology	<ul style="list-style-type: none"> <li>• Define ecology.</li> </ul>
4.1. Habitat, Population and Community	<ul style="list-style-type: none"> <li>• Define the following with examples:               <ul style="list-style-type: none"> <li>➤ Habitat</li> <li>➤ Population</li> <li>➤ Community</li> </ul> </li> </ul>
4.2. Environment Abiotic environment Adaptations to abiotic environment Biotic environment Food relationship Predator-Prey relationship	<ul style="list-style-type: none"> <li>• Define environment.</li> <li>• Explain the influence of abiotic environment on the survival of an organism.</li> <li>• Outline the abiotic environment of an organism in terms of:               <ul style="list-style-type: none"> <li>➤ Light</li> <li>➤ Temperature</li> <li>➤ Air</li> <li>➤ Water</li> <li>➤ pH.</li> </ul> </li> <li>• Match given adaptations to provided environment types.</li> <li>• Differentiate between abiotic and biotic environment.</li> <li>• Differentiate between cooperation and competition among the living organism; with examples.</li> <li>• Define the following with examples:               <ul style="list-style-type: none"> <li>➤ Herbivore</li> <li>➤ Carnivore</li> <li>➤ Omnivore</li> <li>➤ Scavengers</li> </ul> </li> <li>• Predict types of relationship among different organisms.</li> <li>• State the adaptation of a predator to catch its prey and of prey to hide from its predator in given examples.</li> </ul>
<p><b>Key Words:</b>            ecology, environment, abiotic, biotic, hibernation, aestivation, camouflage, herbivore, carnivore, omnivore, scavengers, predator, prey, parasite, mutualism.</p> <p><b>Types of Questions:</b></p> <ul style="list-style-type: none"> <li>• Multiple choice questions.</li> <li>• Structured questions.</li> <li>• Short answer reasoning.</li> <li>• Descriptive questions.</li> <li>• Column matching</li> </ul> <p><b>Work book Activities:</b>            Work book activities 4.3 and 4.4.</p> <p><b>Activities/ Experiments:</b></p> <ul style="list-style-type: none"> <li>• Students will visit the botanical garden of the school to observe various populations and communities.</li> </ul>	

**Topic: Food Chain Food Web (International Lower Secondary Science Book 3**

<b>Contents</b>	<b>Learning Outcomes</b>
5.1 Food Chains and Food Webs	<ul style="list-style-type: none"> <li>• Define the terms food chains and food webs.</li> <li>• Differentiate between food chains and food webs.</li> <li>• Define the following terms:               <ul style="list-style-type: none"> <li>➤ Producer</li> <li>➤ Primary Consumer</li> <li>➤ Secondary consumer</li> <li>➤ Tertiary consumer</li> <li>➤ Herbivore</li> <li>➤ Carnivore</li> <li>➤ Omnivore</li> <li>➤ Decomposers</li> <li>➤ Links</li> <li>➤ Trophic level</li> </ul> </li> <li>• Construct a food chain and a food web.</li> <li>• Identify the trophic level of each link in a food chain and food web.</li> <li>• Discuss the influence of the population of one organism on the other organism’s population in a food web.</li> </ul>
5.2 Energy Transfer in a Food chain Pyramid of number Pyramid of biomass	<ul style="list-style-type: none"> <li>• Describe how the flow of energy decreases along the food chain.</li> <li>• Recognize the sun as the principal source of energy input to biological systems and that the flow of energy is non-cyclic.</li> <li>• Explain why food chains usually have fewer than five trophic levels.</li> <li>• Define pyramid of number.</li> <li>• Construct pyramid of number from the given food chain.</li> <li>• Define pyramid of bio mass.</li> <li>• Compare pyramid of number and biomass.</li> </ul>
5.3. Decomposers	<ul style="list-style-type: none"> <li>• Explain the role of decomposers in a food chain.</li> </ul>
<p><b>Key Words:</b> food chain, food web, trophic level, link, pyramid of number, pyramid of biomass, decomposition.</p> <p><b>Types of Questions:</b></p> <ul style="list-style-type: none"> <li>• Multiple choice questions.</li> <li>• Structured questions.</li> <li>• Short answer reasoning.</li> <li>• Descriptive questions.</li> <li>• Construction of food chain and food web.</li> <li>• Construct pyramid of number and biomass.</li> </ul> <p><b>Work book activities:</b> Work book activities 5.1, 5.2 and 5.3.</p> <p><b>Activities/ Experiments:</b></p> <ul style="list-style-type: none"> <li>• Students will visit school ground to construct food chains or web in different habitat.</li> </ul>	

**Topic: Sound and Hearing (International Lower Secondary Science Book 3)**

Contents	Learning Outcomes
<p>11.1 Hearing Sounds</p> <p>How are sounds made</p> <p>How do sounds travel</p> <p>How do we hear sounds</p>	<ul style="list-style-type: none"> <li>• Define the following:               <ul style="list-style-type: none"> <li>➤ Sound</li> <li>➤ Vibration</li> <li>➤ Waves</li> </ul> </li> <li>• List the different types of waves.</li> <li>• Identify longitudinal and transverse waves.</li> <li>• Differentiate between longitudinal and transverse waves.</li> <li>• Describe how sound travels in a series of compression and rarefaction.</li> <li>• Identify the region of compression and rarefaction.</li> <li>• Design an experiment to show how sound needs a medium to travel.</li> <li>• Label the parts of a human ear.</li> <li>• Explain the function of each part of the human ear in detecting sound vibrations.</li> </ul>
<p>11.2 Pitch and Loudness</p> <p>Pitch and Frequency</p> <p>Loudness and Amplitude</p>	<ul style="list-style-type: none"> <li>• Define the following terms:               <ul style="list-style-type: none"> <li>➤ Speed</li> <li>➤ Frequency</li> <li>➤ Wavelength</li> <li>➤ Pitch</li> <li>➤ Amplitude</li> </ul> </li> <li>• Enumerate wavelength using graphic description.</li> <li>• Calculate wavelength using formula.</li> <li>• Calculate frequency using formula.</li> <li>• Calculate frequency, wavelength and speed using the formula.</li> <li>• State the approximate range of audible frequencies for a healthy human ear.</li> <li>• Define ultrasound and infrasound.</li> <li>• State the relationship between pitch and frequency.</li> <li>• Describe how the frequency of sound can be increased or decreased.</li> <li>• State the relationship between loudness and amplitude.</li> <li>• State the unit of measurement for loudness.</li> <li>• Describe how the loudness of sound can be increased or decreased.</li> <li>• Define noise.</li> <li>• Design an experiment to measure the speed of sound.</li> <li>• Define echo.</li> <li>• Determine the distance traveled by an object using echo.</li> <li>• Identify the sounds of different pitch, frequency loudness and amplitude.</li> </ul>
<p><b>Key Words:</b> vibration, wave, frequency, amplitude, oscillation, tension, soft sound, loud sound, infra sound, ultra sound, echo.</p> <p><b>Types of Questions:</b></p> <ul style="list-style-type: none"> <li>• Multiple choice questions.</li> <li>• Structured questions.</li> <li>• Short answer reasoning.</li> <li>• Descriptive questions.</li> <li>• Calculations of speed, frequency, wavelength, vibrations over distance.</li> </ul>	

**Work book activities:**

Work book activities 11.1 and 11.2.

**Activities/ Experiments:**

- Students will conduct all Work book activities.

**Surf IT:**

<https://www.youtube.com/watch?v=79zTZYWyCRg>

<https://www.youtube.com/watch?v=-bKy02f1pD4>

<https://www.youtube.com/watch?v=YTZcSaPn92s>

**Topic: Writing and Balancing Equations (Hand out and Chapter: Periodic table)**

Contents	Learning Outcomes
16.1 Features of the Periodic Table	<ul style="list-style-type: none"> <li>• Identify the correct placement of an element in the Periodic Table on the basis of its atomic number.</li> <li>• Draw the atomic structure and write the electronic configuration of first twenty elements of the Periodic Table.</li> <li>• Find out the number of protons/neutrons/nucleon/electron from given structures or configurations.</li> <li>• Find out the valency of an element or ion from its atomic number or electronic configuration.</li> <li>• Illustrate and explain the formation of positive ions and negative ions of metals and non-metals respectively.</li> <li>• Identify ionic compounds and covalent compounds.</li> </ul>
Chemical Formula Writing and Balancing Equations	<ul style="list-style-type: none"> <li>• State the symbols of first 20 elements and symbols of the following elements:               <ul style="list-style-type: none"> <li>➤ Iron</li> <li>➤ Zinc</li> <li>➤ Silver</li> <li>➤ Copper</li> <li>➤ Gallium</li> </ul> </li> <li>• Differentiate between the symbol of an element and the formula of a compound.</li> <li>• Derive the chemical formulae of ionic compounds by swapping and shifting valencies.</li> <li>• State the names and symbol/formulae of poly atomic or complex ions.</li> <li>• Derive the chemical formula of compounds containing following complex ions;               <ul style="list-style-type: none"> <li>➤ OH<sup>-</sup>Hydroxide ion</li> <li>➤ NO<sub>3</sub><sup>-</sup>Nitrate ion</li> <li>➤ HCO<sub>3</sub><sup>-</sup>Bicarbonate or hydrogen carbonate ion</li> <li>➤ CO<sub>3</sub><sup>-2</sup>Carbonate ion</li> <li>➤ SO<sub>4</sub><sup>-2</sup>Sulfate ion</li> <li>➤ PO<sub>4</sub><sup>-3</sup>Phosphate ion</li> <li>➤ NH<sub>4</sub><sup>+</sup>Ammonium ion</li> </ul> </li> <li>• State the names of compound by identifying chemical formula.</li> <li>• Understand the balancing of number of atoms of each element on both side of a chemical equation i.e. reactant side and product side.</li> <li>• Balance given formula equations.</li> <li>• Complete and balance the equations for:               <ul style="list-style-type: none"> <li>➤ chemical reactions of acids</li> <li>➤ chemical reactions of alkalis</li> <li>➤ Group I alkali metals</li> <li>➤ Group VII halogens.</li> </ul> </li> <li>• Convert given word equation to formula equation and balance them.</li> </ul>
<p><b>Key Words:</b>            elements, ions, compounds, valency, symbol, formula, compound ions, polyatomic ions, equation, balanced equation.</p> <p><b>Types of Questions:</b></p> <ul style="list-style-type: none"> <li>• Multiple choice questions.</li> <li>• Structured questions.</li> <li>• Short answer reasoning.</li> <li>• Illustrative questions.</li> </ul>	

- Drawing of first 20 elements atomic structure and electronic configuration.
- Derive formula of ionic compounds from their names.
- Writing names of ionic compounds from the formula.
- Finding number of protons/neutrons/ electrons/ mass number/ valency/ group and period of an element or of its ion.
- Word equations.
- Balancing formula equations.
- Completing incomplete equations.

**Activities**

- Work sheets.

**Topic: Light (International Lower Secondary Science Book 3)**

<b>Contents</b>	<b>Learning Outcomes</b>
10.1 Nature of Light	<ul style="list-style-type: none"> <li>• Discuss the dual nature of light.</li> <li>• Compare the speed of light in solid, liquid, gas and vacuum.</li> <li>• State the speed of light in vacuum.</li> <li>• Compare the speed of light with the speed of sound.</li> <li>• State the differences between light and sound.</li> <li>• Calculate the speed, wavelength and frequency of light waves using formulae.</li> <li>• Define electromagnetic waves.</li> <li>• List the main components of the electromagnetic spectrum.</li> <li>• Draw a table to show the arrangement of electromagnetic waves in term of increasing or decreasing frequency and wavelength.</li> <li>• State the uses of electromagnetic waves.</li> <li>• Design an experiment to investigate that light travels in a straight line.</li> <li>• Define the following terms:               <ul style="list-style-type: none"> <li>➤ Ray</li> <li>➤ Beam</li> <li>➤ Divergent beam</li> <li>➤ Convergent beam</li> <li>➤ Luminous objects</li> <li>➤ Non-luminous objects</li> </ul> </li> <li>• Define transparent materials with examples and uses.</li> <li>• Define translucent materials with examples and uses.</li> <li>• Define opaque materials with examples and uses.</li> </ul>
10.2 Shadows	<ul style="list-style-type: none"> <li>• Define shadow.</li> <li>• State what is meant by point source and extended source.</li> <li>• Label the region of umbra and penumbra of a shadow.</li> <li>• Predict the effect on size of shadow by increasing or decreasing the distance of an object from a point source.</li> <li>• Predict the effect on size of shadow by increasing or decreasing the distance of an object from an extended source.</li> </ul>
10.3 Reflection Of Light Types of Mirror Images formed by a plane mirror Concave and convex mirrors	<ul style="list-style-type: none"> <li>• Define reflection of light.</li> <li>• Define the following terms:               <ul style="list-style-type: none"> <li>➤ Incident ray</li> <li>➤ Reflected ray</li> <li>➤ Normal</li> <li>➤ Angle of incidence</li> <li>➤ Angle of reflection</li> </ul> </li> <li>• List the types of reflection.</li> <li>• State the importance of regular reflection.</li> <li>• State the importance of irregular reflection.</li> <li>• State and illustrate law of reflection.</li> <li>• Measure and draw the angle of incidence and angle of reflection.</li> <li>• Define real and virtual image.</li> <li>• Illustrate the formation of virtual and real images from a smooth surface.</li> <li>• State the types of mirror.</li> <li>• Illustrate the formation of image by a plane mirror.</li> </ul>

	<ul style="list-style-type: none"> <li>• State the characteristics of image formed by a plane mirror.</li> <li>• State the uses of plane mirrors.</li> <li>• Define concave mirrors.</li> <li>• Define convex mirrors.</li> <li>• Illustrate the formation of image by a concave mirror.</li> <li>• State the characteristics of image formed by a concave mirror.</li> <li>• State the uses of concave mirrors.</li> <li>• Illustrate the formation of image by convex mirrors.</li> <li>• State the characteristics of image formed by convex mirrors.</li> <li>• State the uses of convex mirrors.</li> </ul>
<p>10.4 Refraction of light</p> <p>Effects of refraction</p> <p>Concave and convex lens</p>	<ul style="list-style-type: none"> <li>• Define refraction of light.</li> <li>• Define the following terms; <ul style="list-style-type: none"> <li>➤ Refracted ray</li> <li>➤ Emergent ray</li> <li>➤ Angle of incidence.</li> <li>➤ Angle of refraction.</li> <li>➤ Angle of emergence.</li> <li>➤ Rarer medium</li> <li>➤ Denser medium</li> </ul> </li> <li>• Describe the effect of changing medium on the speed of light.</li> <li>• Illustrate the refraction of light.</li> <li>• Measure angle of incidence and angle of refraction.</li> <li>• Illustrate that angle of incidence is always equal to angle of emergence.</li> <li>• Explain the following effects of refraction; <ul style="list-style-type: none"> <li>➤ Image formed on the retina of eye.</li> <li>➤ Apparent depth</li> <li>➤ Objects appear bent when partially immersed in water.</li> <li>➤ Dispersion of white light.</li> </ul> </li> <li>• Define concave and convex lens.</li> <li>• Illustrate the image formed by concave lens.</li> <li>• State the uses of concave lens.</li> <li>• Illustrate the image formed by convex lens.</li> <li>• State the uses of convex lens.</li> </ul>
<p>10.5 Colours</p>	<ul style="list-style-type: none"> <li>• List the primary colours of light.</li> <li>• List the secondary colours of light.</li> <li>• Understand that object appear a certain colour because they reflects that colour and absorbs the rest.</li> <li>• Explain how any object can appear white or black.</li> <li>• Predict the colour of an object using light filters.</li> <li>• Predict the colour of an object under different colours of light.</li> </ul>
<p><b>Key Words:</b>  wave, frequency, wavelength, reflection, refraction, convergent beam, divergent beam, parallel beam, incident ray, reflected ray, refracted ray, emergent ray, real image, virtual image, lenses, converging lens, diverging lens, apparent depth, dispersion.</p> <p><b>Types of Questions:</b></p> <ul style="list-style-type: none"> <li>• Multiple choice questions.</li> <li>• Structured questions.</li> <li>• Short answer reasoning.</li> <li>• Descriptive questions.</li> <li>• Measurement of angles.</li> </ul>	

- Column matching.
- Illustration of reflection, refraction and apparent depth.
- Fill in the blanks.

**Work book Activities:**

Work book activities 10.1, 10.2, 10.3, 10.4 and 10.5.

**Activities/ Experiment:**

- Students will practice shadow casting.
- Students will observe images formed by concave and convex mirrors.

**Surf IT:**

<https://www.youtube.com/watch?v=m4t7gTmBK3g>

<https://www.youtube.com/watch?v=Ticmypf8z8s>

<https://www.youtube.com/watch?v=xXjWpVibaY4>

[https://www.youtube.com/watch?v=eY\\_VoB5VaGw](https://www.youtube.com/watch?v=eY_VoB5VaGw)

<https://www.youtube.com/watch?v=30FCqf46TK8>

[https://www.youtube.com/watch?v=I\\_3cQpJQU-s](https://www.youtube.com/watch?v=I_3cQpJQU-s)

**Topic: Man’s Impacts on Ecosystem (International Lower Secondary Science Book 3)**

<b>Contents</b>	<b>Learning Outcomes</b>
<p>6.1 Effects of Human Activities on the Ecosystem</p> <p>Pollution</p> <p>Air Pollution</p> <p>Water pollution</p> <p>Land Pollution</p> <p>Introduction of foreign specie</p> <p>Over exploitation of natural resources</p>	<ul style="list-style-type: none"> <li>• Define ecosystem.</li> <li>• Define pollutants.</li> <li>• Discuss the main causes of pollution.</li> <li>• Describe the formation and effect of acid rain.</li> <li>• Define green house effect.</li> <li>• Explain what is meant by enhanced green house effect.</li> <li>• State the causes of global warming.</li> <li>• Describe the effect of global warming.</li> <li>• Discuss the causes of water pollution.</li> <li>• Explain the effect of water pollution.</li> <li>• Discuss the causes of land pollution.</li> <li>• Explain the effect of land pollution.</li> <li>• Describe how the introduction of foreign species by human can harm the environment. Provide examples.</li> <li>• Discuss how over hunting and excessive use of energy can harm the environment.</li> </ul>
<p>6.2 Conserving Our Environment</p>	<ul style="list-style-type: none"> <li>• Explain why it is important to conserve the environment.</li> <li>• Discuss the ways how an individual, organizations and government can conserve the environment.</li> </ul>
<p><b>Key Words:</b> ecosystem, pollutants, haze, acid rain, global warming, algal bloom, landfills, over-exploitation, conservation of energy.</p> <p><b>Types of Questions:</b></p> <ul style="list-style-type: none"> <li>• Multiple choice questions.</li> <li>• Structured questions.</li> <li>• Short answer reasoning.</li> <li>• Descriptive questions.</li> </ul> <p><b>Work book Activities:</b> Work book activities 6.1 and 6.2.</p> <p><b>Activities and Experiment:</b> Multimedia presentation.</p>	