

Learning Standards

Unit title/ statement of inquiry	Knowledge Content Students are expected to know the following...	Concepts	Curricular Competencies Students are expected to do the following...
Scientific method and measurement The international scientific community has a shared system of conventions which enables its members to communicate and collaborate effectively in extending the knowledge and progress of humanity. 4 weeks	<ul style="list-style-type: none"> The terms precision, accuracy, reliability and fairness How to evaluate an experiment and suggest improvements The differences between scientific errors, limitations and mistakes The seven base units of the International System of Units and appropriate use of decimal places and units 	Perspective Methodology Scale	Knowing and understanding <ul style="list-style-type: none"> Explain scientific knowledge Apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations Analyse and evaluate information to make scientifically supported judgments. Inquiring and designing <ul style="list-style-type: none"> Explain a problem or question to be tested by a scientific investigation Formulate a testable hypothesis and explain it using scientific reasoning Explain how to manipulate the variables, and explain how data will be collected Design scientific investigations. Processing and evaluating <ul style="list-style-type: none"> Present collected and transformed data Interpret data and explain results using scientific reasoning Evaluate the validity of a hypothesis based on the outcome of the scientific investigation Evaluate the validity of the method Explain improvements or extensions to the method. Reflecting on the impact of science <ul style="list-style-type: none"> Explain the ways in which science is applied and used to address a specific problem or issue Discuss and evaluate the various implications of the use of science and its application in solving a specific problem or issue Apply scientific language effectively Document the work of others and sources of information used.
Turn up the heat Disruptions to the balance within and between systems can have serious consequences. 7 weeks	<ul style="list-style-type: none"> The difference between internal energy and temperature How thermometers work Three methods of heat transfer Specific heat capacity and specific latent heat Endothermic/ exothermic reactions and bond energy calculations Homeostasis and the role of the nervous and endocrine systems The greenhouse effect and factors that lead to the enhanced greenhouse effect and climate change 	Systems Energy Environment	
Bond Energy & Homeostasis The stability of systems is dependent upon maintaining the balance within the system and interactions between the system and its surroundings 5 weeks	<ul style="list-style-type: none"> balancing reactions endo/exothermic bond energies homeostasis temperature regulation skin structure heat loss, heat production, energy, square and cube scaling rules, applications of scaling to biological organisms, climate change 	Systems Energy Models	
Cells, diffusion and osmosis Animal and plant cells display a variety of forms and features which allow them to carry out their specific function with greater efficiency. 5 weeks	<ul style="list-style-type: none"> The structure and function of cell components How cell structures are related to their functions How to draw biologically The advantages of light and electron microscopes How to calculate size, scale or magnification of specimens Diffusion and osmosis 	Relationships Form Function	
Atomic theory and periodicity	<ul style="list-style-type: none"> The difference between evidence and inference in a scientific model 	Development Models	

<p>Scientists use models to express, enhance and explore their understanding of patterns in nature.</p> <p>3 weeks</p>	<ul style="list-style-type: none"> • The structure of the atom • The terms atom, element, isotope, atomic number and mass number • The organization and trends of the periodic table • How to balance chemical equations • That the properties of elements are closely related to their uses 	<p>Patterns</p>	
<p>Bonding and structure</p> <p>The relationships that underpin atomic bonds (and which establish the nature of these bonds) allow the creation of a diverse range of materials with distinct physical and chemical properties.</p> <p>3 weeks</p>	<ul style="list-style-type: none"> • Ionic bonding • Covalent bonding • Metallic bonding • How the properties of substances is related to their bonding 	<p>Relationships Forms</p>	
<p>Immunity and infectious disease</p> <p>The inequality of systems and differences in environment impact the development of communities and individuals.</p> <p>7 weeks</p>	<ul style="list-style-type: none"> • The components of blood • The causes of disease (infectious and non-infectious) • How disease is spread and different methods to prevent spread • Natural barriers to pathogens • The role of phagocytes and lymphocytes in immunity • Vaccination • Some common sexually transmitted infections, their symptoms, treatment and methods of prevention 	<p>Systems Consequence Environment</p>	