

Sciences Subject Group Overview - Application - Year 1

Unit Title and Teaching Hours	Key Concept	Related Concepts	Global Context	Statement of Inquiry	Objectives	ATL Skills	Content (topics, knowledge, skills)
Natural Resources - 30 hours	System	environment, consequences	Fairness and Development	Human dependence and use of natural resources extracted from the Earth system has environmental consequences that must be considered with fairness and responsibility.	B, C	Self-Management: III. Organization skills and Self-Management V. Reflection skills.	-Research and evaluate data and information to learn about the types and availability of various natural resources, and use this knowledge to make evidence-based decisions (3.3.a) 6. / -Identify and evaluate types and availability of renewable and nonrenewable resources (3.3.b) 6. / -Use direct and indirect evidence to determine the types of resources and their applications used in communities (3.3.c) 6. / -Research and critically evaluate data and information about the advantages and disadvantages of using fossil fuels and alternative energy sources (3.3.d) 6
Water, Weather, and Climate - 45 hours	Relationships	interaction, patterns, models	Scientific and Technical Innovation	Water is a finite and fundamental resource interacting with the 4 spheres of matter comprising our planet and influencing the relationship between short term weather patterns and long term climate models.	A, B	Self-Management: III. Organization skills	Gather and analyze data from a variety of print resources and investigations to account for local and world-wide water circulation and distribution patterns (3.2.a) 6 / -Use evidence to model how water is transferred throughout the earth (3.2.b) 6 / -Identify problems, and propose solutions related to water quality, circulation, and distribution - both locally and worldwide (3.2.c) 6 / - Identify the various causes and effects of water pollution in local and world water distributions (3.2.d) 6 /-Describe where water goes after it is used in houses or buildings (3.2.e) 6 Differentiate between basic and severe weather conditions, and develop an appropriate action plan for personal safety and the safety of others (3.1.a) 8 Observe and gather data for various weather conditions and compare to historical data for that date and location (3.1.b) 8 Use models to develop and communicate a weather prediction (3.1.c) 8 Develop, communicate and justify an evidence-based scientific explanation to account for Earth's different climates (3.2.a) 8 Research and evaluate direct and indirect evidence to explain how climates vary from one location to another on Earth (3.2.b) 8 Examine, evaluate, and question information from a variety of sources and media to investigate how climates vary from one location to another on Earth (3.2.c) 8

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Space - 50 hours	Time, Place and Space	models, movement, patterns	Orientation in Space and Time	Interpretation of our Solar System's origin, history and orientation in space and time has evolved through observation, models and exploration to explain the relative movements between the primary components with predictable patterns to their consequences.	A, D	Self-Management: III. Organization skills and Self-Management V. Reflection skills.	Develop, communicate, and justify an evidence-based explanation using relative positions of Earth, Moon, and Sun to explain the following natural phenomenon: 1. Tides 2. Eclipses of the Sun and Moon 3. Different shapes of the Moon as viewed from Earth (3.4.a) 8 / -Analyze and interpret data to explain why we have seasons (3.4.b) 8 / - Use models to explain the relative motions of Earth, Moon, and Sun over time (3.4.c) 8 / - Construct a scale model of the solar system, and use it to explain the motion of objects in the system such as planets, Sun, Moons, asteroids, comets, and dwarf planets (3.3.a) 8 / -Describe methods and equipment used to explore the solar system and beyond (3.3.b) 8 / -Design an investigation that involves direct observation of objects in the sky, and analyze and explain results (3.3.c) 8 / -Research, critique, and communicate scientific theories that explain how the solar system was formed (3.3.d) 8 / -Use computer data sets and simulations to explore objects in the solar system (3.3.e) 8 / -Recognize that mathematical models are used to predict orbital paths and events (3.3.f) 8
Earth Forces - 45 hours	Change	transformation, evidence, models	Scientific and Technical Innovation	Earth's history and changing geologic movements are relevant to understanding the processes that transform the planet.	C, D	Self-Management: III. Organization skills	Gather, analyze, and communicate an evidence-based explanation for the complex interaction between Earth's constructive and destructive forces (3.1.a) 6 / -Gather, analyze and communicate evidence from text and other sources that explains the formation of Earth's surface features (3.1.b) 6 / -Use or create a computer simulation for Earth's changing crust (3.1.c) 6 / -Describe the geologic time scale and why it is used (3.2.a) 7 / -Identify and describe the impact of major geologic events on life on Earth (3.2.b) 7 / -Identify and describe major events in Earth's geologic history (3.2.c) 7 / -Use direct and indirect evidence to determine the sequence of events in geologic time (3.2.d) 7 / -Gather, analyze, and communicate data that explains Earth's plates, plate motions, and the results of plate motions (3.1.a) 7 / - Identify, interpret, and explain models of plates motions on Earth (3.1.b) 7

Sciences Subject Group Overview - Application - Year 2

Unit Title and Teaching Hours	Key Concept	Related Concepts	Global Context	Statement of Inquiry	ATL Skills	Objectives	Content (topics, knowledge, skills)
Human Body - 30-35 hours	system	function, connections	Identities and Relationships	Students will inquire into who they are and explore how the form and function of our body systems are connected to support life.	Social: II. Collaboration Skills	A, B	Develop and design a scientific investigation about human body systems (2.2.a) Develop, communicate, and justify an evidence-based scientific explanation regarding the functions and interactions of the human body (2.2.b) Gather, analyze, and interpret data and models on the functions and interactions of the human body (2.2.c)
Cell Biology - 45-50 hours	form	function, models	Orientation in time and space	Scientists use models to demonstrate orientation in time and space for the form and function of cells.	Social: II. Collaboration Skills	A, C	Gather, analyze, and interpret data and models on the different types of cells, their structures, components, and functions (2.3.a) Develop, communicate, and justify an evidence-based scientific explanation regarding cell structures, components, and their specific functions (2.3.b) Compare and contrast the basic structures and functions of plant cells, animal cells, and single-celled organisms (2.3.c) Employ tools to gather, view, analyze, and report results for the scientific investigations of cells (2.3.d)

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Genetics - 30 hours	relationships	interaction, patterns	Personal and Cultural Expression	Within genetics, the relationship and interaction between alleles forms patterns that influence our personal and cultural identities.	Social: II. Collaboration Skills	A, D	Develop, communicate, and justify an evidence-based scientific explanation for how genetic information is passed to the next generation (2.2.a) Use direct and indirect observations, evidence, and data to support claims about genetic reproduction and traits of individuals (2.2.b) Gather, analyze, and interpret data on transmitting genetic information (2.2.c) Use models and diagrams to predict the phenotype and genotype of offspring based on the genotype of the parents (2.2.d) Use computer simulations to model and predict the phenotype and genotype of offspring based on the genotype of the parents (2.2.e)
Ecology - 35 hours	relationships	energy, balance, environment	Globalization and Sustainability	Energy movement through an environment creates a special balanced relationship; one in which our sustainability and future globalization must remain vigilant of.	Social: II. Collaboration Skills	A, C	Gather, analyze, and interpret data regarding the basic functions of photosynthesis and cellular respiration (2.4.a) Use direct and indirect evidence to describe the relationship between photosynthesis and cellular respiration within plants – and between plants and animals (2.4.b) Use computer simulations to model the relationship between photosynthesis and cellular respiration (2.4.c)

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Evolution - 15-25 hours	change	transformation, consequences	Orientation in Space and Time	Changes in a system may transform organisms resulting in consequences during a particular space and and time.	Social: II. Collaboration Skills	B, D	Develop, communicate, and justify an evidence-based explanation for why a given organism with specific traits will or will not survive to have offspring in a given environment (2.1.a) Analyze and interpret data about specific adaptations to provide evidence and develop claims about differential survival and reproductive success (2.1.b) Use information and communication technology tools to gather information from credible sources, analyze findings, and draw conclusions to create and justify an evidence-based scientific explanation (2.1.c)

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Unit Title and Teaching Hours	Key Concept	Related Concepts	Global Context	Statement of Inquiry	Objectives	ATL Skills	Content (topics, knowledge, skills)
Changes in Matter - 40 hours	Change	Form, Transfer, Function	Identities and Relationships	Matter can be identified by unique properties and functions that when changed and transformed identify all matter.	A, C	Thinking: VIII. Critical-Thinking Skills	State Standard 1. Physical Science, Grade Level 6, Concept 3; State Standard 1. Physical Science, Grade Level 6, Concept 4; State Standard 1. Physical Science, Grade Level 8, Concept 3; State Standard 1. Physical Science, Grade Level 7, Concept 1
Chemistry of Matter - 40 hours	Identity	Conditions, Form, Transformation	Identities and Relationships	Matter can be identified by unique atoms that when formed and transformed into various compounds and molecules make up all matter.	A, C	Thinking: VIII. Critical-Thinking Skills	State Standard 1. Physical Science, Grade Level 6, Concept 1; State Standard 1. Physical Science, Grade Level 6, Concept 2
Energy - 40 hours	Relationship	Energy, Transformation, Movement	Globalization and Sustainability	There is a relationship between energy's transformations and conservation	B, D	Thinking: VIII. Critical-Thinking Skills	State Standard 1. Physical Science, Grade Level 8, Concept 2
Waves - 20 hours	Change	Form, Models, Movement	Scientific and Technical Innovation	Scientific and technological advances involving wave forms and movement can be utilized in creating models for medical and technological application.	B, D	Thinking: VIII. Critical-Thinking Skills and Research: VII. Media literacy skills	State Standard 1. Physical Science, Grade Level 8, Concept 4

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<p>Forces and Motion - 20 hours</p>	<p>System</p>	<p>Movement, Environment, Interaction</p>	<p>Scientific and Technical Innovation</p>	<p>We observe, explain, and predict the natural phenomena governed by Newton's laws of motion, acknowledging the limitations of their application to very small or very fast objects using scientific tools and innovations.</p>	<p>B, C</p>	<p>Thinking: VIII. Critical-Thinking Skills</p>	<p>State Standard 1. Physical Science, Grade Level 8, Concept 1</p>
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