Science Essential Standards (Current draft – accessible in SchoolNet by 8/25/2010)

S1: Properties & Scale

Concept	Enduring Understanding	PK	K	1	2	3	4	5	6	7	8	9	10	11	12
Properties	**Learners characterize objects, organisms, and substances using properties.**	Observe properties of things in the world; identify and classify based on those observed properties.				Characterize the form and function of objects, organisms and substances by observing its properties			Characterize the function of objects, organisms and substances specifically as related to form			Analyze the relationship between the shape/structure of an object, organism or substance and its function/behavior			
Measurement	**Learners represent properties on a numerical scale using measurement.**	Represent length, mass, volume and temperature using non-standard units of measure in order to compare the properties of objects to each other numerically.			Represent length, mass, volume and temperature using metric units of measure in order to compare the properties of objects to a given standard.	Represent an increasing number of properties of an object using standard units of measure, using tools with an increased level of precision in order to compare these properties to a given standard of measure as accurately as possible.					Represent properties using standard units of measure, recognizing the limitations in precision of these measurements based on the limitations in our tools and senses.				
Scale	**Learners compare objects, living things, and events relative to time and space using scale.**	Measure and calculate calendar time, and organize events chronologically				Comprehend and interpret data as it relates to time and space, making reasonable estimates for data			Recognize relevance of data/information at different size, time and energy scales, making reasonable estimates for data			Apply knowledge of relevance of data/information at different size, time and energy scales, recognizing any changes in proportional relationships as scales change			

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S2: Change & Constancy

Concept	Enduring Understanding	PK	K	1	2	3	4	5	6	7	8	9	10	11	12
Cause & Effect	**Learners make inferences to explain the causes of changes they observe in nature.**	Make direct observations that explain the causes of observed changes in nature			Make indirect observations (inferences) that explain the causes of observed changes in nature		Apply background knowledge of relationships between observed effects and inferred causes to determine causal relationships			Justify causal relationships between observed changes and inferred causes for change using all of the evidence that applies					
Cycles	**Learners organize change into cycles, which allow them to predict outcomes.**	Recognize patterns and cycles within nature and life				Make connections between various cycles and their relationship to change over time; make predictions about next steps in cycles				Recognize the causes of cyclical patterns observed in nature, and evaluate the effects of the changes in those causes					
Equilibrium	**Learners recognize the counterbalanced changes that lead to stability.**	Recognize when a system is balanced, and when it is unbalanced				Understand that nature seeks equilibrium, and unbalanced systems tend toward changes that counter their unbalance			Recognize systems that are in equilibrium, and predict the effect of changes to the system that promote disequilibrium			Assess the state of balance within systems, and predict the changes that the system will undergo in order to achieve equilibrium (as well as the effects of those changes)			

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S3: Systems & Interactions

Concept	Enduring Understanding	PK	K	1	2	3	4	5	6	7	8	9	10	11	12
Systems	**Learners organize parts into a system to display observable and predictable patterns.**		Define a system based on a common connection among components			Define a system based on its boundaries, components, and resources flow (input and output)			Analyze system related to its boundaries, components, resources flow (input and output), and feedback			Analyze systems related to their boundaries, components, resource flow (input and output), and feedback, comparing different systems to each other (or subsystems within larger systems) through this analysis			
Interaction	**Learners examine the interactions between parts of a system that lead to forming a functional whole.**		Know different forms of energy and matter, understand their role in connecting parts of a system						Track the energy/matter flow through a system from input to output so as to better understand the relationships between parts of a system			Follow the energy/matter flow through a system so as to better understand the parts of a system, recognizing the limitations that continued interaction has on the components			
Organization	**Learners organize systems in various ways to highlight different properties and functions of the system.**		Organize/classify parts of a system based on common characteristics			Recognize multiple ways/methods of organizing parts of a system based on desired focus			Describe a system at different levels of organization (based on desired focus within the system)			Compare multiple methods of organization of a system, and evaluate based on desired focus within the system			

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S4: Inquiry & Communication

Concept	Enduring Understanding	PK	K	1	2	3	4	5	6	7	8	9	10	11	12
Investigation	Learners ask questions about the natural world to build understanding, and seek answers to those questions in a systematic way.		Develop questions based on observations, and make predictions based on observed patterns.		Use questions based on observations to form a testable hypothesis that relates their observations to each other, and draw conclusions from their investigation of the hypothesis.		Plan a method to test the validity of predictions about relationships by manipulating one specific variable over time, starting by forming a testable hypothesis.			Plan and conduct investigations that test the validity of predictions about relationships, using and applying research of scientific knowledge as part of the process				Plan and conduct investigations in order to understand relationships, providing justification using empirical evidence and research	
Theory	Learners use continuously evolving theories to explain why natural phenomena occur.		Develop and evaluate inferences and predictions that are based on observation				Research the history of developing scientific knowledge in various contexts, focusing on how theories evolve based on available evidence					Construct, defend, and justify arguments related to investigations, using empirical information as the basis for said justification			

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S4: Inquiry & Communication (cont'd)

Concept	Enduring Understanding	PK	K	1	2	3	4	5	6	7	8	9	10	11	12
Communication	**Learners collect, organize, communicate, and verify information in a deliberate manner.**		Record, analyze and communicate observations and data through graphs, pictures, written statements and numbers			Record, analyze and communicate observations and data through tables, graphs, pictures, written statements and numbers as appropriate				Collect relevant data, and create and use appropriate graphical representations of data based on the desired idea to be communicated		Distinguish the characteristics of well-communicated observations and data, and choose a representation of data that best fits the purpose of communication			
Models	**Learners use continuously evolving theories to explain why natural phenomena occur.**		Construct drawings and representations of events in order to communicate understanding			Construct models using drawings & representations (as well as analogy and metaphor) in order to communicate and facilitate understanding			Build and use physical and mathematical models to make predictions and explain phenomena			Build and use physical and mathematical models to make predictions and explain phenomena, revising the models to better fit available evidence		Use mathematical models as a means of expressing physical patterns and relationships	