NGSS Matrix of Standards by Discipline and Grade Level

		Life Science	Earth & Space Science	Physical Science	Engineering & Technology
	к	K.OTE Organisms and Their Environments	K.WEA Weather	K.SPM Structure and Properties of Matter	
Elementary School	1	1.SF Structure and Function	1.PC Patterns and Cycles	1.LS Light and Sound	
	2	2.IOS Interdependence of Organisms and their Surroundings	2.ECS Earth's Changing Surface	2.SPM Structure, Properties, and Interactions of Matter2.PP Pushes and Pulls	In grades K-5, the core ideas for Engineering, Technology, and the Application of Science are included in the Life Science, Earth & Space Science, and Physical Science standards
	3	3.EIO Environmental Impacts on Organisms 3.SFS Structure, Function, and Stimuli	3.WCI Weather, Climate, and Impacts	3.IF Interactions of Forces	
	4	4.LCT Life Cycles and Traits	4.PSE Processes that Shape the Earth	4.E Energy 4.WAV Waves	
	5	5.MEE Matter and Energy in Ecosystems	5.ESI Earth Systems and Their Interactions 5.SSS Stars and the Solar System	5.SPM Structure, Properties, and Interactions of Matter	
	Middle School	 MS.LS-SFIP Structure, Function, and Information Processing MS.LS-GDRO Growth, Development, and Reproduction of Organisms MS.LS-MEOE Matter and Energy in Organisms and Ecosystems MS.LS-IRE Interdependent Relationships in Ecosystems MS.LS-NSA Natural Selection and Adaptations 	MS.ESS-SS Space Systems MS.ESS-HE History of Earth MS.ESS-EIP Earth's Interior Processes MS.ESS-ESP Earth's Surface Processes MS.ESS-WC Weather and Climate MS.ESS-HI Human Impacts	MS.PS-SPM Structure and Properties of Matter MS.PS-CR Chemical Reactions MS.PS-FM Forces and Motion MS.PS-IF Interactions of Forces MS.PS-E Energy MS.PS-WER Waves and Electromagnetic Radiation	MS.ETS-ED Engineering Design MS.ETS-ETSS Links Among Engineering, Technology, Science and Society
	High School	 HS.LS-SFIP Structure, Function, and Information Processing HS.LS-MEOE Matter and Energy in Organisms and Ecosystems HS.LS-IRE Interdependent Relationships in Ecosystems HS.LS-NSE Natural Selection and Evolution HS.LS-IVT Inheritance and Variation of Traits 	HS.ESS-SS Space Systems HS.ESS-HE History of Earth HS.ESS-ES Earth's Systems HS.ESS-CC Climate Change HS.ESS-HS Human Sustainability	 HS.PS-SPM Structure and Properties of Matter HS.PS-CR Chemical Reactions HS.PS-NP Nuclear Processes HS.PS-FM Forces and Motion HS.PS-IF Interactions of Forces HS.PS-E Energy HS.PS-FE Forces and Energy HS.PS-W Waves HS.PS-ER Electromagnetic Radiation 	HS.ETS-ED Engineering Design HS.ETS-ETSS Links Among Engineering, Technology, Science and Society

Inside the **NGSS Box**

What is Assessed

A collection of several performance expectations describing what students should be able to do to master this standard

Foundation Box

The practices, core disciplinary ideas, and crosscutting concepts from the Framework for K-12 Science Education that were used to form the performance expectations

Connection Box

Other standards in the Next Generation Science Standards or in the Common Core State Standards that are related to this standard

Title and Code

Two standards at different grade levels may use the same name if they focus on the same topic. The code, however, is a unique identifier for each standard based on the grade level, content area, and topic of the standard.

Structure and Properties of Matte s who demonstrate understanding car

- number of atoms and repeating subunits. [Clarification States
- b. Plan investigations to generate evidence supporting the claim that one pure substance can be distinguished from based on characteristic properties [Clarification Statement: Properties of substances can incl ammability, and phase
- c. Use a simulation or mechanical model to determine the effect on the temperature and motion of atoms different substances when thermal energy is added to or removed from the substance. use of mathematical formulas are not intended.
- d. Construct an argument that explains the effect of adding or removing thermal energy to a phases and during a phase change in terms of atomic and molecular motion intended.1

The performance expectations above were developed using the following elements from the NKs, document A framework for K-12 Science Education.						
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts				
Developing and Using Models Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to explain, explore, and predict more abstract phenomena and design systems . Use and/or construct models to predict, explain, and/or collect data to test ideas about phenomena in natural or designed systems, including those	PS1.A: Structure and Properties of Matter • All substances are (inde from some 100 different types of atoms, which combex which can adobter in various which Atoms from molecule that range in size from two to thousands of atoms @ • Pure substances are analyticity of allow or molecule cach pure substance/bas chargetering bypicial	Patterns Macroscopic patterns are related to the nature of microscopic and atomic-local determination of the exercise and all mammitcal relationships can provide utorimption about natural and human designed systems. Patterns can be used to identify-atise and effect relationships. Graphe parternits can be used to				
representing inputs and outputs. Over Planning and Carrying Out Investigations Planning and Carrying out Investigations to answer questions or test solutions to problems in 6-8 builds on K-5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or design solutions. • Plan and carry out investigations individually and	and chemical properties (fix any bulk giantify 'under given conditions) that can be used to (denity) (b) Gasss.and liquids are made of molecular of the con- trait are mixing about relative to each other. (d) In a liquid, the molecules are constantly in contact with others; in a gis, lifty are workly spaced execut when they happen to collide. In a solid, atoms are closely they happen to collede. In a solid, atoms are closely	Identify patterns in data Cause and Effect Relationships can be classified as causal or correlational, and correlation does not necessarily imply causation. Cause and effect relationships may be used to predict phenomena in natural or designed systems. Phenomena may have more than one cause, and some means of deficient caustions, can only be				
collaboratively, identifying independent and dependent variables, and controls. (b) E collect data and generate evidence to ariswer scientific (questions or test design solutions inder a range of conditions. (b) Engaging in Argument from Evidence Engaging in Argument from Evidence Engaging in Argument from Evidence K-5 experiences and progressits to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world. Use oral and written arguments supported by empirical evidence and reasoning to support or refute an explanation for a phenomenon or a solution to a problem. (d)	 relative locations: (c),(d) Selicits any be profitmed from molecules, or they may be extended structures with repeating subunits (e.g., crystak), (a) The changes of state that occur with variations in temperature or presure can be described and predicted using these models dot, matter. (c),(d) The term "theat" as used in everyday language refers beht to of thream motion (the motion of atoms or melecules within a substance) and radiation (particularly infrared and light). (c),(d) Temperature is not a measure of emergy, the relationship betydem the temperature and the total energy of a system depends on the types, states, and amounts of protect of the substance of the states. 	described using probability. (c),(d) Structure and microscopic structures and systems can implex and microscopic structures and systems can be visible of modeled, and used to describe how their function dependence of the structures, composition, and relationships among its part, therefore complex natural and designed to serve particular functions by taking in account properties of different materials, and how materials can be shaped and used. (b)				
Connections to other DCIs in this grade-level: MS.ESS-ES	P, MS.ESS-SS, MS.LS-MEOE					
Articulation of DCIs across grade-levels: 3.1F, 5.SPM, HS.PS.SPM, HS.PS-NP, HS.PS-F. Common Core State Standards Connections: [Note: these connections will be made more explicit and complete in future draft releases] ELA –						
W.5.2 Write informative/explanatory texts to examin	Write informative/explanatory texts to examine a topic and convey ideas and information clearly.					
w.o.1 write arguments to support claims with clear w71 Write arguments to support claims with clear	write arguments to support claims with clear reasons and relevant evidence.					
SL.5.4 Report on a topic or text or present an opinio speak clearly at an understandable pace.	Report on a topy common way of the resource of					
SL.6.4 Present claims and findings, sequencing idea	Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye					

- contact, adequate volume, and clear pronunciation
- SL.7.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate contact, adequate volume, and clear pronunciation WHST.6-8.1 Write arguments focused on discipline-specific content.

RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks Mathematics -

- MP.4 MP.8 Model with mathematics. Look for and express regularity in repeated reasoning
- 6.SP Develop understanding of statistical variability
 - Summarize and describe distributions

Performance Expectations

A statement that combines practices, core ideas, and crosscutting concepts together to describe how students can show what they have learned.

Clarification Statement

A statement that supplies examples or additional clarification to the performance expectation.

Assessment Boundary

A statement that provides guidance about the scope of the performance expectation at a particular grade level.

Lowercase Letters

Lowercase letters at the end of practices, core ideas, and crosscutting Concepts designate which Performance expectation incorporates them.

Scientific & Engineering Practices

Activities that scientists and engineers engage in to either understand the world or solve a problem

Disciplinary Core Ideas

Concepts in science and engineering that have broad importance within and across disciplines as well as relevance in people's lives.

Crosscutting Concepts

Ideas. such as Patterns and Cause and Effect, which are not specific to any one discipline but cut across them all.

