F.8 Physical Science - Grades 6-8

PROVIDER/PUBLISHER / MATERIAL INFORMATION (TO BE COMPLETED BY PROVIDER/PUBLISHER)			
Provider/Publisher / Imprint:		Grade(s):	
Title of Student Edition:		Student Edition ISBN:	
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PUBLISHER CITATION VIDEO: Must be viewed before starting the review of this set of materials.			
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Section 1: Standards Review: Science

Abbreviations for the Form F Standards Review Tab:
- PE: Performance Expectation
- DCI: Disciplinary Core Idea
- SEP: Science and Engineering Practices
- CONN: Connections
- NM: NM STEM Ready Standard
- CCSS: Common Core State Standards for ELA/Literacy in Science and Common Core State Standards for Math in Science as identified in the NGSS

PUBLISHER/PROVIDER INSTRUCTIONS:
- Publisher/Provider citations for this section will refer to the **Teacher Edition (teacher-facing core material).** The cited Teacher Edition should correspond with the title and ISBN entered on the Form F cover page, whether in print, online, or both. The review set submitted to the summer review institute should also correspond with what is cited on the Form F. If the review set is an online platform only, then that is what should be cited on the Form F and submitted for review by the review teams. If the review set is in print only, then that is what should be cited on the Form F and submitted for review by the review teams.
- For this section, the publisher/provider will enter one citation per DCI, SEP, CCC, CONN, and NM standard in Column D. Each citation should direct the reviewer to a specific location in the materials that best meets the standard. The citations should be concise and should allow the reviewer to easily determine that all components of the standard have been met. Each citation should cover no more than 3 pages within the materials. ***Any cells grayed out do not require a citation.***
  - o Column D: Enter one citation in Column D from the **Teacher Edition (teacher-facing core material)**. Each citation should direct the reviewer to a specific location in the materials that best meets the standard. The cited material for each DCI, SEP, CCC, and CONN must directly relate to the PE under which they fall.
- The material will be scored for alignment with each DCI, SEP, CCC, CONN, and NM standard within each PE as “Meets expectations", “Partially meets expectations", or “Does not meet expectations” based on the citations provided. A score for the PE will be derived from the related DCIs, SEPS, CCCs, CONNs, and NM Standards within the PE.
  - **o NOTE: You may not use a citation more than once across ALL sections of the rubric.**

Criteria #	Standard Identifier	F.8 Grades 6-8 Physical Science Standards Review:	Publisher/Provider Citation from Teacher Edition	Score	If Scored D: Reviewer's Evidence for Publisher Citation	Reviewer Citation from Student Edition/Workbook	Score	Required: Reviewer's Evidence	Comments, other citations, notes
Matter and Its Interactions									
1	PE	**MS-PS1-1. Students who demonstrate understanding can: Develop models to describe the atomic composition of simple molecules and extended structures.**							
2	DCI	**PS1.A: Structure and Properties of Matter** • Substances are made from different types of atoms, which combine with one another in various ways. Atoms form molecules that range in size from two to thousands of atoms.							
3	DCI	**PS1.A: Structure and Properties of Matter** • Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals).							
4	SEP	**Developing and Using Models** *Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems.* • Develop a model to predict and/or describe phenomena.							
5	CCC	**Scale, Proportion, and Quantity** • Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.							
6	PE	**MS-PS1-2. Students who demonstrate understanding can: Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.**							
7	DCI	**PS1.A: Structure and Properties of Matter** • Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it.							
8	DCI	**PS1.B: Chemical Reactions** • Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants.							
9	SEP	**Analyzing and Interpreting Data** *Analyzing data in 6–8 builds on K–5 and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.* • Analyze and interpret data to determine similarities and differences in findings.							

10	**CONN**	**Scientific Knowledge is Based on Empirical Evidence** • Science knowledge is based upon logical and conceptual connections between evidence and explanations.							
11	**CCC**	**Patterns** • Macroscopic patterns are related to the nature of microscopic and atomic-level structure.							
12	**PE**	**MS-PS1-3. Students who demonstrate understanding can: Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.**							
13	**DCI**	**PS1.A: Structure and Properties of Matter** • Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it.							
14	**DCI**	**PS1.B: Chemical Reactions** • Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants.							
15	**SEP**	**Obtaining, Evaluating, and Communicating Information** *Obtaining, evaluating, and communicating information in 6–8 builds on K–5 and progresses to evaluating the merit and validity of ideas and methods.* • Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or now supported by evidence.							
16	**CCC**	**Structure and Function** • Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used.							
17	**CONN**	**Interdependence of Science, Engineering, and Technology** • Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems.							
18	**CONN**	**Influence of Science, Engineering and Technology on Society and the Natural World** • The uses of technologies and any limitation on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus technology use varies from region to region and over time.							
19	**PE**	**MS-PS1-4. Students who demonstrate understanding can: Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.**							
20	**DCI**	**PS1.A: Structure and Properties of Matter** • Gases and liquids are made of molecules or inert atoms that are moving about relative to each other.							
21	**DCI**	**PS1.A: Structure and Properties of Matter** • In a liquid, the molecules are constantly in contact with others; in a gas, they are widely spaced except when they happen to collide. In a solid, atoms are closely spaced and may vibrate in position but do not change relative locations.							
22	**DCI**	**PS1.A: Structure and Properties of Matter** • The changes of state that occur with variations in temperature or pressure can be described and predicted using these models of matter.							

23	DCI	**PS3.A: Definitions of Energy** • The term “heat” as used in everyday language refers both to thermal energy (the motion of atoms or molecules within a substance) and the transfer of that thermal energy from one object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects.							
24	DCI	**PS3.A: Definitions of Energy** • The temperature of a system is proportional to the average internal kinetic energy and potential energy per atom or molecule (whichever is the appropriate building block for the system’s material). The details of that relationship depend on the type of atom or molecule and the interactions among the atoms in the material. Temperature is not a direct measure of a system's total thermal energy. The total thermal energy (sometimes called the total internal energy) of a system depends jointly on the temperature, the total number of atoms in the system, and the state of the material.							
25	SEP	**Developing and Using Models** *Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems.* • Develop a model to predict and/or describe phenomena.							
26	CCC	**Cause and Effect** • Cause and effect relationships may be used to predict phenomena in natural or designed systems.							
27	PE	**MS-PS1-5. Students who demonstrate understanding can: Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.**							
28	DCI	**PS1.B: Chemical Reactions** • Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants.							
29	DCI	**PS1.B: Chemical Reactions** • The total number of each type of atom is conserved, and thus the mass does not change.							
30	SEP	**Developing and Using Models** *Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems.* • Develop a model to describe unobservable mechanisms.							
31	CONN	**Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena** • Laws are regularities or mathematical descriptions of natural phenomena.							
32	CCC	**Energy and Matter** • Matter is conserved because atoms are conserved in physical and chemical processes.							
33	PE	**MS-PS1-6. Students who demonstrate understanding can: Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.**							
34	DCI	**PS1.B: Chemical Reactions** • Some chemical reactions release energy, others store energy.							
35	DCI	**ETS1.B: Developing Possible Solutions** • A solution needs to be tested, and then modified on the basis of the test results, in order to improve it.							

36	**DCI**	**ETS1.C: Optimizing the Design Solution** • Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process - that is, some of the characteristics may be incorporated into the new design.							
37	**DCI**	**ETS1.C: Optimizing the Design Solution** • The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution.							
38	**SEP**	**Constructing Explanations and Designing Solutions** *Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific knowledge, principles, and theories.* • Undertake a design project, engaging in the design cycle, to construct and/or implement a solution that meets specific design criteria and constraints.							
39	**CCC**	**Energy and Matter** • The transfer of energy can be tracked as energy flows through a designed or natural system.							
Motion and Stability: Forces and Interactions									
40	**PE**	**MS-PS2-1. Students who demonstrate understanding can: Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.**							
41	**DCI**	**PS2.A: Forces and Motion** • For any pair of interacting objects, the force exerted by the first object on the second object is equal in strength to the force that the second object exerts on the first, but in the opposite direction (Newton's third law).							
42	**SEP**	**Constructing Explanations and Designing Solutions** *Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.* • Apply scientific ideas or principles to design an object, tool, process or system.							
43	**CCC**	**Systems and System Models** • Models can be used to represent systems and their interactions—such as inputs, processes and outputs—and energy and matter flows within systems.							
44	**CONN**	**Influence of Science, Engineering, and Technology on Society and the Natural World** • The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions.							
45	**PE**	**MS-PS2-2. Students who demonstrate understanding can: Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.**							
46	**DCI**	**PS2.A: Forces and Motion** • The motion of an object is determined by the sum of the forces acting on it; if the total force on the object is not zero, its motion will change. The greater the mass of the object, the greater the force needed to achieve the same change in motion. For any given object, a larger force causes a larger change in motion.							

47	DCI	**PS2.A: Forces and Motion** • All positions of objects and the directions of forces and motions must be described in an arbitrarily chosen reference frame and arbitrarily chosen units of size. In order to share information with other people, these choices must also be shared.							
48	SEP	**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 an investigation individually and collaboratively, and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim.							
49	CONN	**Scientific Knowledge is Based on Empirical Evidence** • Science knowledge is based upon logical and conceptual connections between evidence and explanations.							
50	CCC	**Stability and Change** • Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and forces at different scales.							
51	PE	**MS-PS2-3. Students who demonstrate understanding can: Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.**							
52	DCI	**PS2.B: Types of Interactions** • Electric and magnetic(electromagnetic) forces can be attractive or repulsive, and their sizes depend on the magnitudes of the charges, currents, or magnetic strengths involved and on the distances between the interacting objects.							
53	SEP	**Asking Questions and Defining Problems** *Asking questions and defining problems in grades 6–8 builds from grades K–5 experiences and progresses to specifying relationships between variables, and clarifying arguments and models.* • Ask questions that can be investigated within the scope of the classroom,outdoor environment, and museums and other public facilities with available resources and, when appropriate, frame a hypothesis based on observations and scientific principles.							
54	CCC	**Cause and Effect** • Cause and effect relationships may be used to predict phenomena in natural or designed systems.							
55	PE	**MS-PS2-4. Students who demonstrate understanding can: Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.**							
56	DCI	**PS2.B: Types of Interactions** • Gravitational forces are always attractive. There is a gravitational force between any two masses, but it is very small except when one or both of the objects have large mass—e.g., Earth and the sun.							
57	SEP	**Engaging in Argument from Evidence** *Engaging in argument from evidence in 6–8 builds from K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world.* • Construct and present oral and written arguments supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.							
58	CONN	**Scientific Knowledge is Based on Empirical Evidence** • Science knowledge is based upon logical and conceptual connections between evidence and explanations.							

59	CCC	**Systems and System Models** • Models can be used to represent systems and their interactions—such as inputs, processes and outputs—and energy and matter flows within systems.							
60	PE	**MS-PS2-5. Students who demonstrate understanding can: Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.**							
61	DCI	**PS2.B: Types of Interactions** • Forces that act at a distance(electric, magnetic, and gravitational) can be explained by fields that extend through space and can be mapped by their effect on a test object (a charged object, or a ball, respectively).							
62	SEP	**Planning and Carrying Out Investigations** *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.* • Conduct an investigation and evaluate the experimental design to produce data to serve as the basis for evidence that can meet the goals of the investigation.							
63	CCC	**Cause and Effect** • Cause and effect relationships may be used to predict phenomena in natural or designed systems.							
Energy									
64	PE	**MS-PS3-1. Students who demonstrate understanding can: Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.**							
65	DCI	**PS3.A: Definitions of Energy** • Motion energy is properly called kinetic energy; it is proportional to the mass of the moving object and grows with the square of its speed.							
66	SEP	**Analyzing and Interpreting Data** *Analyzing data in 6–8 builds on K–5 and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.* • Construct and interpret graphical displays of data to identify linear and nonlinear relationships.							
67	CCC	**Scale, Proportion, and Quantity** • Proportional relationships (e.g. speed as the ratio of distance traveled to time taken) among different types of quantities provide information about the magnitude of properties and processes.							
68	PE	**MS-PS3-2. Students who demonstrate understanding can: Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.**							
69	DCI	**PS3.A: Definitions of Energy** • A system of objects may also contain stored (potential) energy, depending on their relative positions.							
70	DCI	**PS3.C: Relationship Between Energy and Forces** • When two objects interact, each one exerts a force on the other that can cause energy to be transferred to or from the object.							
71	SEP	**Developing and Using Models** *Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems.* • Develop a model to describe unobservable mechanisms.							

72	**CCC**	**Systems and System Models** • Models can be used to represent systems and their interactions – such as inputs, processes, and outputs – and energy and matter flows within systems.							
73	**PE**	**MS-PS3-3. Students who demonstrate understanding can: Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.**							
74	**DCI**	**PS3.A: Definitions of Energy** • Temperature is a measure of the average kinetic energy of particles of matter. The relationship between the temperature and the total energy of a system depends on the types, states, and amounts of matter present.							
75	**DCI**	**PS3.B: Conservation of Energy and Energy Transfer** • Energy is spontaneously transferred out of hotter regions or objects and into colder ones.							
76	**DCI**	**ETS1.A: Defining and Delimiting an Engineering Problem** • The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that is likely to limit possible solutions.							
77	**DCI**	**ETS1.B: Developing Possible Solutions** • A solution needs to be tested, and then modified on the basis of the test results in order to improve it. There are systematic processes for evaluating solutions with respect to how well they meet criteria and constraints of a problem.							
78	**SEP**	**Constructing Explanations and Designing Solutions** *Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.* • Apply scientific ideas or principles to design, construct, and test a design of an object, tool, process or system.							
79	**CCC**	**Energy and Matter** • The transfer of energy can be tracked as energy flows through a designed or natural system.							
80	**PE**	**MS-PS3-4. Students who demonstrate understanding can: Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.**							
81	**DCI**	**PS3.A: Definitions of Energy** • Temperature is a measure of the average kinetic energy of particles of matter. The relationship between the temperature and the total energy of a system depends on the types, states, and amounts of matter present.							
82	**DCI**	**PS3.B: Conservation of Energy and Energy Transfer** • The amount of energy transfer needed to change the temperature of a matter sample by a given amount depends on the nature of the matter, the size of the sample, and the environment.							
83	**SEP**	**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 an investigation individually and collaboratively, and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim.							

84	CONN	**Scientific Knowledge is Based on Empirical Evidence** • Science knowledge is based upon logical and conceptual connections between evidence and explanations.							
85	CCC	**Scale, Proportion, and Quantity** • Proportional relationships (e.g.speed as the ratio of distance traveled to time taken) among different types of quantities provide information about the magnitude of properties and processes.							
86	PE	**MS-PS3-5. Students who demonstrate understanding can: Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.**							
87	DCI	**PS3.B: Conservation of Energy and Energy Transfer** • When the motion energy of an object changes,there is inevitably some other change in energy at the same time.							
88	SEP	**Engaging in Argument from Evidence** *Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed worlds.* • Construct, use, and present oral and written arguments supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon.							
89	CONN	**Scientific Knowledge is Based on Empirical Evidence** • Science knowledge is based upon logical and conceptual connections between evidence and explanations.							
90	CCC	**Energy and Matter** • Energy may take different forms (e.g.energy in fields, thermal energy, energy of motion).							
Waves and Their Applications in Technologies for Information Transfer									
91	PE	**MS-PS4-1. Students who demonstrate understanding can: Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.**							
92	DCI	**PS4.A: Wave Properties** • A simple wave has a repeating pattern with a specific wavelength, frequency, and amplitude.							
93	SEP	**Using Mathematics and Computational Thinking** *Mathematical and computational thinking at the 6–8 level builds on K–5 and progresses to identifying patterns in large data sets and using mathematical concepts to support explanations and arguments.* • Use mathematical representations to describe and/or support scientific conclusions and design solutions.							
94	CONN	**Scientific Knowledge is Based on Empirical Evidence** • Science knowledge is based upon logical and conceptual connections between evidence and explanations.							
95	CCC	**Patterns** • Graphs and charts can be used to identify patterns in data.							
96	PE	**MS-PS4-2. Students who demonstrate understanding can: Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.**							
97	DCI	**PS4.A: Wave Properties** • A sound wave needs a medium through which it is transmitted.							
98	DCI	**PS4.B: Electromagnetic Radiation** • When light shines on an object, it is reflected, absorbed, or transmitted through the object, depending on the object's material and the frequency (color) of the light.							
99	DCI	**PS4.B: Electromagnetic Radiation** • The path that light travels can be traced as straight lines, except at surfaces between different transparent materials (e.g., air and water, air and glass) where the light path bends.							

100	DCI	**PS4.B: Electromagnetic Radiation** • A wave model of light is useful for explaining brightness, color, and the frequency-dependent bending of light at a surface between media.							
101	DCI	**PS4.B: Electromagnetic Radiation** • However, because light can travel through space, it cannot be a matter wave, like sound or water waves.							
102	SEP	**Developing and Using Models** *Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems.* • Develop and use a model to describe phenomena.							
103	CCC	**Structure and Function** • Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used.							
104	PE	**MS-PS4-3. Students who demonstrate understanding can: Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.**							
105	DCI	**PS4.C: Information Technologies and Instrumentation** • Digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information.							
106	SEP	**Obtaining, Evaluating, and Communicating Information** *Obtaining, evaluating, and communicating information in 6-8 builds on K-5 and progresses to evaluating the merit and validity of ideas and methods.* • Integrate qualitative scientific and technical information in written text with that contained in media and visual displays to clarify claims and findings.							
107	CCC	**Structure and Function** • Structures can be designed to serve particular functions.							
108	CONN	**Influence of Science, Engineering, and Technology on Society and the Natural World** • Technologies extend the measurement, exploration, modeling, and computational capacity of scientific investigations.							
109	CONN	**Science is a Human Endeavor** • Advances in technology influence the progress of science and science has influenced advances in technology.							
Engineering Design:									
110	PE	**MS-ETS1-1. Students who demonstrate understanding can: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.**							
111	DCI	**ETS1.A: Defining and Delimiting Engineering Problems** • The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions. (MS-ETS1-1)							
112	SEP	**Asking Questions and Defining Problems** *Asking questions and defining problems in grades 6–8 builds on grades K–5 experiences and progresses to specifying relationships between variables, and clarifying arguments and models.* • Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions. (MS-ETS1-1)							

113	CCC	**Influence of Science, Engineering, and Technology on Society and the Natural World** ▪ All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. (MS- ETS1-1)							
114	CCC	**Influence of Science, Engineering, and Technology on Society and the Natural World** ▪ The uses of technologies and limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. (MS-ETS1-1)							
115	PE	**MS-ETS1-2. Students who demonstrate understanding can: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.**							
116	DCI	**ETS1.B: Developing Possible Solutions** ▪ There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (MS-ETS1-2)							
117	SEP	**Engaging in Argument from Evidence** *Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world.* ▪ Evaluate competing design solutions based on jointly developed and agreed-upon design criteria. (MS-ETS1-2)							
118	PE	**MS-ETS1-3. Students who demonstrate understanding can: Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solutions to better meet the criteria for success.**							
119	DCI	**ETS1.B: Developing Possible Solutions** ▪ There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (MS-ETS1-3)							
120	DCI	**ETS1.B: Developing Possible Solutions** ▪ Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors. (MS-ETS1-3)							
121	DCI	**ETS1.C: Optimizing the Design Solution** ▪ Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of those characteristics may be incorporated into the new design. (MS-ETS1-3)							
122	SEP	**Analyzing and Interpreting Data** *Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.* ▪ Analyze and interpret data to determine similarities and differences in findings. (MS-ETS1-3)							
123	PE	**MS-ETS1-4. Students who demonstrate understanding can: Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.**							
124	DCI	**ETS1.B: Developing Possible Solutions** ▪ A solution needs to be tested, and then modified on the basis of the test results, in order to improve it. (MS-ETS1-4)							

125	DCI	**ETS1.B: Developing Possible Solutions** ▪ Models of all kinds are important for testing solutions. (MS-ETS1-4)							
126	DCI	**ETS1.C: Optimizing the Design Solution** ▪ The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution. (MS-ETS1-4)							
127	SEP	**Developing and Using Models** *Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.* ▪ Develop a model to generate data to test ideas about designed systems, including those representing inputs and outputs. (MS-ETS1-4)							

CCSS for ELA/Literacy and Math in Grades 6-8 NGSS **• NOTE: The standards noted at the end of each CCSS (such as *(HS-ESS1-1), (HS-ESS1-2), (HS-ESS1-5)*) are the occurrences of the CCSS within the NGSS.**									
Grades 6-8 CCSS ELA/Literacy									
128	CCSS ELA/ Literacy	**RST.6-8.1** Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. *(MS-PS1-2), (MS-PS1-3), (MS-PS2-1), (MSPS2-3), (MS-PS3-1), (MSPS3-5), (MS-PS4-3), (MS-ETS1-1), (MS-ETS1-2), (MS-ETS1-3)*							
129	CCSS ELA/ Literacy	**RST.6-8.2** Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. *(MS-PS4-3)*							
130	CCSS ELA/ Literacy	**RST.6-8.3** Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. *(MS-PS1-6), (MS-PS2-1), (MS-PS2-2), (MS-PS2-5), (MS-PS3-3), (MS-PS3-4)*							
131	CCSS ELA/ Literacy	**RST.6-8.7** Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). *(MS-PS1-1), (MS-PS1-2), (MS-PS1-4), (MS-PS1-5), (MS-PS3-1), (MS-ETS1-3)*							
132	CCSS ELA/ Literacy	**RST.6-8.9** Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. *(MS-PS4-3), (MS-ETS1-2), (MS-ETS1-3)*							
133	CCSS ELA/ Literacy	**WHST.6-8.1** Write arguments focused on discipline-specific content. *(MS-PS2-4), (MS-PS3-5)*							
134	CCSS ELA/ Literacy	**WHST.6-8.7** Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related,focused questions that allow for multiple avenues of exploration. *(MS-PS1-6), (MS-PS2-1), (MS-PS2-2), (MS-PS2-5), (MS-PS3-3), (MS-PS3-4), (MS-ETS1-2)*							
135	CCSS ELA/ Literacy	**WHST.6-8.8** Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. *(MS-PS1-3), (MS-ETS1-1)*							

136	**CCSS ELA/ Literacy**	**WHST.6-8.9** Draw evidence from informational texts to support analysis, reflection, and research. *(MS-PS4-3), (MS-ETS1-2)*							
137	**CCSS ELA/ Literacy**	**SL.8.5** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. *(MS-PS3-2), (MS-PS4-1), (MS-PS4-2), (MS-ETS1-4)*							
Grades 6-8 CCSS Math									
138	**CCSS Math**	**MP.2** Reason abstractly and quantitatively. *(MS-PS1-1), (MS-PS1-2), (MS-PS1-5), (MS-PS2-1), (MS-PS2-2), (MS-PS2-3), (MS-PS3-1), (MS-PS3-4), (MS-PS3-5), (MS-PS4-1), (MS-ETS1-1), (MS-ETS1-2), (MS-ETS1-3), (MS-ETS1-4)*							
139	**CCSS Math**	**MP.4** Model with mathematics. *(MS-PS1-1), (MS-PS1-5), (MS-PS4-1)*							
140	**CCSS Math**	**6.RP.A.1** Understand the concept of ratio and use ratio language to describe a ratio relationship between two quantities. *(MS-PS3-1), (MS-PS3-5)*							
141	**CCSS Math**	**6.RP.A.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *(MS-PS4-1)*							
142	**CCSS Math**	**6.RP.A.2** Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. *(MS-PS3-1)*							
143	**CCSS Math**	**6.RP.A.3** Use ratio and rate reasoning to solve real-world and mathematical problems. *(MS-PS1-1), (MS-PS1-2), (MS-PS1-5), (MS-PS4-1)*							
144	**CCSS Math**	**7.RP.A.2** Recognize and represent proportional relationships between quantities. *(MS-PS3-1), (MS-PS3-5), (MS-PS4-1)*							
145	**CCSS Math**	**6.NS.C.5** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. *(MS-PS1-4), (MS-PS2-1)*							
146	**CCSS Math**	**6.EE.A.2** Write, read, and evaluate expressions in which letters stand for numbers. *(MS-PS2-1), (MS-PS2-2)*							
147	**CCSS Math**	**7.EE.B.3 S**olve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form, using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *(MS-PS2-1), (MS-PS2-2), (MS-ETS1-1), (MS-ETS1-2), (MS-ETS1-3)*							
148	**CCSS Math**	**7.EE.B.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. *(MS-PS2-1), (MS-PS2-2)*							
149	**CCSS Math**	**8.EE.A.1** Know and apply the properties of integer exponents to generate equivalent numerical expressions. *(MS-PS3-1)*							
150	**CCSS Math**	**8.EE.A.3** Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *(MS-PS1-1)*							

151	**CCSS Math**	**8.EE.A.2** Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3 = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational. *(MS-PS3-1)*							
152	**CCSS Math**	**RST.6-8.1** Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. *(MS-PS1-2), (MS-PS1-3), (MS-PS2-1), (MS-PS2-3), (MS-PS3-1), (MS-PS3-5), (MS-PS4-3), (MS-ETS1-1), (MS-ETS1-2), (MS-ETS1-3)*							
153	**CCSS Math**	**6.SP.B.4** Display numerical data in plots on a number line, including dot plots, histograms, and box plots. *(MS-PS1-2)*							
154	**CCSS Math**	**6.SP.B.5** Summarize numerical data sets in relation to their context. *(MS-PS1-2), (MS-PS3-4)*							
155	**CCSS Math**	**7.SP.7** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. *(MS-ETS1-4)*							

Section 2: Science Content Review								
PROVIDER/PUBLISHER INSTRUCTIONS: • Publisher/provider citations for this section will refer to the **Teacher Edition (teacher-facing core material)** and/or **Student Edition/Student Workbook (student-facing core material)**. The cited Teacher Edition, Student Edition, and/or Student Workbook should correspond with titles and ISBNs entered on the Form F cover page, whether in print, online, or both. The review set submitted to the summer review institute should also correspond with what is cited on the Form F. If the review set is an online platform only, then that is what should be cited on the Form F and submitted for review by the review teams. If the review set is in print only, then that is what should be cited on the Form F and submitted for review by the review teams. • For this section, the publisher/provider will enter one citation per criterion (Column C). Each citation should direct the reviewer to a specific location in the materials that best meets the criterion. The citations should be concise and should allow the reviewer to easily determine that all components of the criterion have been met. Each citation should cover no more than 3 pages within the materials. o **Column C:** Enter one citation in Column C from either the **Teacher Edition (teacher-facing core material)** OR **Student Edition/Student Workbook (student-facing core material)**. Each citation should direct the reviewer to a specific location in the materials that best meets the criterion. • The material will be scored for alignment with each criterion as "Meets expectations", "Partially meets expectations", or "Does not meet expectations" based on the citations provided. **o NOTE: You may not use a citation more than once across ALL sections of the rubric.**								
Criteria #	**Grade K-12 Science Content Criteria**	Publisher/Provider Citation	Score	If Scored D: Reviewer's Evidence for Publisher Citation	Reviewer Citation	Score	Required: Reviewer's Evidence	Comments, other citations, notes
FOCUS AREA 1: PHENOMENA-/PROBLEM-BASED AND THREE-DIMENSIONAL APPROACH **Instructional materials are centered around high quality phenomena and/or problems and require a three dimensional approach to make sense of the phenomena or to solve the problems.**								
1	Materials clearly integrate and describe the three-dimensional NM STEM Ready! Standards via appropriate grade-band, interdisciplinary progressions that center around the phenomena, utilizing aligned SEPs, CCCs, DCIs and the common core math and ELA standards' connections.							
2	Materials consistently support meaningful student sensemaking with the three dimensions, including discourse, that is appropriate to grade band progressions, instruction and assessment.							
3	Natural and designed phenomena and/or problems that are meaningful and apparent to students drive coherent lessons and activities in all three dimensions.							
FOCUS AREA 2: THREE-DIMENSIONAL ASSESSMENT **Assessments provide tools, guidance and support for teachers to collect, interpret and act on data about student progress toward the learning goals of the 3 dimensional standards.**								
4	Materials engage students in meaningful tasks as well as multiple assessment types and opportunities, across all dimensions, in order to make sense of phenomena and/or design solutions to problems.							
5	Materials include opportunities for students to obtain feedback from teachers and peers as well as opportunities for student self-reflection.							
FOCUS AREA 3: TEACHER SUPPORTS **Materials include opportunities for teachers to effectively plan and utilize materials.**								
6	Materials provide a comprehensive list of supplies and teacher guidance needed to support instructional activities in a safe manner.							
7	Materials provide teacher guidance for the use of embedded and meaningful technology to support and enhance student learning, when applicable.							
8	Materials and assessments include teacher guidance for students at, approaching, or exceeding grade level expectations.							
9	Materials provide teacher guidance for interpreting student evidence of learning, monitoring student progress and providing feedback to guide student learning and to modify instruction.							

FOCUS AREA 4: STUDENT CENTERED INSTRUCTION **Materials are designed for each student's regular and active participation in science content.**								
10	Materials provide opportunities to engage students' curiosity and participation in a way that pulls from their prior knowledge and connects their learning to relevant phenomena and problems.							
11	The flow of lessons from one unit to the next is coherent, meaningful, direct, and apparent to students.							
FOCUS AREA 5: EQUITY **Materials are designed for all learners.**								
12	Materials provide extensions and/or opportunities for all students to engage in learning grade-level/band science and engineering in greater depth.							
13	Materials and assessments are designed in an accessible manner and include multiple ways for all students to build and reflect on science knowledge; multiple ways for all students to access content (Universal Design for Learning); and multiple opportunities for student self-reflection.							

Section 2: All Content Review				
PROVIDERS/PUBLISHERS: • The All Content tab will be completed solely by the reviewers. They will score each criterion and provide evidence for their score from the material based on their overall review of the material. You will not provide any citations for this tab. • The material will be scored for alignment with each criterion as "Meets expectations", "Partially meets expectations", or "Does not meet expectations".				
Criteria #	**All Content Criteria Review**	Score	Required: Reviewer's Evidence from Material	Comments, citations, notes
FOCUS AREA 1: COHERENCE **Instructional materials are coherent and consistent with the New Mexico Content Standards that all students should study in order to be college- and career-ready.**				
1	Instructional materials address the full content contained in the standards for all students by grade level.			
2	Instructional materials support students to show mastery of each standard.			
3	Instructional materials require students to engage at a level of maturity appropriate to the grade level under review.			
4	Instructional materials are coherent, making meaningful connections for students by linking the standards within a lesson and unit.			
FOCUS AREA 2: WELL-DESIGNED LESSONS **Instructional materials take into account effective lesson structure and pacing.**				
5	The Teacher Edition presents learning progressions to provide an overview of the scope and sequence of skills and concepts. The design of the assignments shows a purposeful sequencing of teaching and learning expectations.			
6	Within each lesson of the instructional materials, there are clear, measurable, standards-aligned content objectives.			
7	Within each lesson of the instructional materials, there are clear, measurable language objectives tied directly to the content objectives.			
8	Instructional materials provide focused resources to support students' acquisition of both general academic vocabulary and content-specific vocabulary.			
9	The visual design of the instructional materials (whether in print or digital) maintains a consistent layout that supports student engagement with the subject.			

10	Instructional materials incorporate features that aid students and teachers in making meaning of the text.			
11	Instructional materials provide students with ongoing review and practice for the purpose of retaining previously acquired knowledge.			
FOCUS AREA 3: RESOURCES FOR PLANNING **Instructional materials provide teacher resources to support planning, learning, and understanding of the New Mexico Content Standards.**				
12	Instructional materials provide a list of lessons in the Teacher Edition (in print or clearly distinguished/ accessible as a teacher's edition in digital materials), cross-referencing the standards addressed and providing an estimated instructional time for each lesson, chapter, and unit.			
13	Instructional materials support teachers with instructional strategies to help guide students' academic development.			
14	Instructional materials include a teacher edition/ teacher-facing material with useful annotations and suggestions on how to present the content in the student edition/student-facing material and in the supporting material.			
15	Instructional materials integrate opportunities for digital learning, including interactive digital components.			
FOCUS AREA 4: ASSESSMENT **Instructional materials offer teachers a variety of assessment resources and tools to collect ongoing data about student progress related to the standards.**				
16	Instructional materials provide a variety of assessments that measure student progress in all strands of the standards for the content under review. *(Adopted New Mexico Content Standards for 2024: NM STEM Ready Science Standards)*			
17	Instructional materials provide multiple formative and summative assessments, clearly defining which standards are being assessed through content and language objectives.			
18	Instructional materials provide scoring guides for assessments that are aligned with the standards they address, and that offer teachers guidance in interpreting student performance and suggestions for further instruction, differentiation, remediation and/or acceleration.			

19	Instructional materials provide appropriate assessment alternatives for English Learners, Culturally and Linguistically Diverse students, advanced students, and special needs students.			
20	Instructional materials include opportunities to assess student understanding and knowledge of the standards using technology.			
FOCUS AREA 5: EXTENSIVE SUPPORT **Instructional materials give all students extensive opportunities and support to explore key concepts.**				
21	Instructional materials can be customized or adapted to meet the needs of different student populations.			
22	Instructional materials provide differentiated strategies and/or activities to meet the needs of students working below proficiency and those of advanced learners.			
23	Instructional materials provide appropriate linguistic support for English Learners and Culturally and Linguistically Diverse students, and accommodations and modifications for other special populations that will support their regular and active participation in learning content.			
24	Instructional materials provide strategies and resources for teachers to inform and engage parents, family members, and caregivers of all learners about the program and provide suggestions for how they can help support student progress and achievement.			
25	Instructional materials include opportunities for all students that encourage and support critical and creative thinking and effective problem-solving skills.			
FOCUS AREA 6: CULTURAL AND LINGUISTIC PERSPECTIVES **Instructional materials represent a variety of cultural and linguistic perspectives.**				
26	Instructional materials inform culturally and linguistically responsive pedagogy by affirming students' backgrounds in the materials themselves and in the student discussions.			
27	Instructional materials provide a collection of images, stories, and information, representing a broad range of demographic groups, and do not make generalizations or reinforce stereotypes.			

28	Instructional materials provide context, illustrations, and activities for students to make interdisciplinary connections and/or connections to real-life experiences and diverse cultural and linguistic backgrounds.			
FOCUS AREA 7: INCLUSION OF CULTURALLY AND LINGUISTICALLY RESPONSIVE LENS **Instructional materials highlight diversity in culture and language through multiple perspectives.**				
29	Instructional materials include tools and resources to relate the content area appropriately to diversity in culture and language.			
30	Instructional materials include tools and resources that demonstrate multiple perspectives in a specific concept.			
31	Instructional materials engage students in critical reflection about their own lives and societies, including cultures past and present in New Mexico.			
32	Instructional materials address multiple ethnic descriptions, interpretations, or perspectives of events and experiences.			