- (NYSED)Different kinds of matter exist and many of them can be either solid or liquid. Matter can be described, categorized, and sorted by its observable properties. (P-PS1-1)

PS2.A: Forces and Motion

- Pushes and pulls can have different strengths and directions. (P-PS2-1)
- Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. (P-PS2-1)

PS3.C: Relationship Between Energy and Forces

- (NYSED) A push or a pull may cause stationary objects to move, and a stronger push or pull in the same or opposite direction makes an object in motion speed up or slow down more quickly. (secondary to P-PS2-1)

PS4.A: Wave Properties

- Sound can make matter vibrate, and vibrating matter can make sound. (P-PS4-1)

ETS1.A: Defining Engineering Problems

- A situation that people want to change or create can be approached as a problem to be solved through engineering. Such

PS1-1); K.PS2.A (P-PS2-1); K.PS2.B (P-PS2-1); K.PS3.C (P-PS2-1); 1.PS4.A (P-PS4-1)

New York State Next Generation Learning Standards Connections

ELA/Literacy–

PKR1 Participate in discussions about a text. (P-PS1-1),(P-PS2-1),(P-PS4-1)

PKR4 Exhibit an interest in learning new vocabulary. (P-PS1-1),(P-PS2-1),(P-PS4-1)

PKW2 Use a combination of drawing, dictating, oral expression, and/or emergent writing to name a familiar topic and supply information in child-centered, authentic, play-based learning. (P-PS1-1),(P-PS2-1),(P-PS4-1)

PKW3 Use a combination of drawing, dictating, oral expression, and/or emergent writing to narrate an event or events in a sequence. (P

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The text in the “Disciplinary Core Ideas” section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Idq 2d Tw 2hsx mis638 0 T88(o)-0.7(r)23.1(e)1(I)1.6

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The text in the “Disciplinary Core Ideas” section is

*The performance expectations marked with

2. Structure and Properties of Matter

Students who demonstrate understanding can:

2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. [Clarification Statement: Observations manv-1.4(se)10.8(t-9(b)1.6(i)0c

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The text in the "Disciplinary Core Ideas" section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas unless it is preceded by (NYSED).

3. Interdependent Relationships in Ecosystems

Students who demonstrate understanding can:

3-LS2-1. Construct an argument that some animals form groups that help members survive. [Clarification Statement: Examples of groups could include a herd of cattle, a swarm of bees, a flock of geese, a pod of whales, etc.]

3-LS4-1. Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago. [Clarification Statement: Examples of data could include type, a x0.012 Tc 0.012 T

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The text in the "Disciplinary Core Ideas" section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas unless it is preceded by (NYSED).

*The performance expectations marked

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The text in the “Discipisciplinai

5. Structure and Properties of Matter

Students who demonstrate understanding can:

5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen. [Clarification Statement: Examples of evidence supporting a model could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.] [Assessment Boundary: Assessment does not include the atomic-scale mechanism of evaporation and condensation or defining the unseen particles.]

5-PS1-2. Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances the total amount of matter is conserved. [Clarification Statement: Examples of reactions or changes could include phase changes, dissolving, and mixing that form new substances. Assume that reactions with any gas production are conducted in a closed system.] [Assessment Boundary: Assessment does not include distinguishing between mass and weight.]

5-PS1-3. Make observations and measurements to identify materials based on their properties. [Clarification Statement: Examples of m [illegible]

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The text in the "Disciplinary Core Ideas" section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas unless it is preceded by (NYSED).

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The text in the “Disciplinary Core Ideas” section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas d0c3Che(.7(re)]TJ 0 T64.50716.5(c)-1274.)T13

5. Earth's Systems

Students who demonstrate understanding can:

5-ESS2-1. Develop a

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The text in the "Disciplinary Core Ideas" section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas unless it is preceded by (NYSED).

MS. Structure and Properties of Matter

Students who demonstrate understanding can:

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The text in the “Discipry

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The text in the “Disciplinary Core Ideas” section is reproduced

MS. Space Systems

Students who demonstrate understanding can:

MS-ESS1-1. Develop and use a model of the Earth-Sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the Sun and moon, and seasons. [Clarification Statement: Examples of models could include physical, graphical, or conceptual models.]

MS-ESS1-2. Develop and use a model to describe the role of gravity in the motions within

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The text in the “Disciplinary Core Ideas” section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas unless it is preceded by (NYSED).

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The text in the “Disciplinary Core

MS. Engineering Design

Students who demonstrate understanding

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The text in the "Disciplinary Core Ideas" section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas unless it is preceded by (NYSED).

NY-7.EE.3	Solve multi-step real-world and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate. Assess the reasonableness of answers using mental computation and estimation strategies. (MS-ETS1-1),(MS-ETS1-2),(MS-ETS1-3)

**Connection boxes updated as of September 2018*

HS. Structure and Properties of Matter

Students who demonstrate understanding can:

HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms. [Clarification Statement: Examples of properties that could be predicted from patterns could include reactivity of metals, types of bonds formed, numbers of bonds formed, and reactions with oxygen.ò 0 1.cb . 1.if.3(7)Tj(m)6.ssm b

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.
The text in the "Disciplinary Core Ideas" section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas unless it is preceded by (NYSED).

HS. Chemical Reactions

Students who demonstrate understanding can:

HS-PS1-2. Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of

103(er) 13(v5..le) 13(dd06 -t.0.)1(e)]53.73230 Tw 0.21T01266 re3148P <(i13-2)10]i9909(31t5i53-18c2i4)699w829[0utoCID 23 >

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practi ce or Disciplinary Core Idea.
The text in the "Disciplinary Core Ideas" section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas unless it is preceded by (NYSED).

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practi ce or Disciplinary Core Idea.

The text in the

	integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any on e source and following a standard format for citation. (HS-PS2-5)
11-12.WHST.7	Draw evidence from informational texts to support analysis, reflection, and research. (HS-PS2-1), (HS-PS2-5)
Mathematics –	
MP.2	Reason abstractly and quantitatively. (HS-PS2-1),(HS-PS2-2),(HS-PS2-4)
MP.4	Model with Mathematics. (HS-PS2-1),(HS-PS2-2),(HS-PS2-4)
AI -N.Q.1	Select quantities and use units as a way to: i) interpret and guide the solution of multi -step problems; ii) choose and interpret units consistently in formulas; and iii) choose an N.T0.24.5(c)p25.7.017 0 Td [(.)-0.6( )]TJ /TT1 1 Tf - 4.002 Tc 0.002 Tw [(N)-6.9(.)0.7(Q)-7.1(.)0.6(1)]TJ /TT1 1 Tf 0 Tc -0.002 Tw

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practi ce or Disciplinary Core Idea.
The text in the "Disciplinary Core Ideas" section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas unless it is preceded by (NYSED).

HS. Energy

Students who demonstrate understanding can:

HS-PS3-1. Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known. [Clarification Statement: Emphasis is on explaining the meaning of mathematical expressions for energy, work, and power used in the model.] [Assessment Boundary: Assessment is limited to basic algebraic expressions or computations; to systems of two or three components; and to work, power, thermal energy,

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.
The text in the "Disciplinary Core Ideas" section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas unless it is preceded by (NYSED).

-1TJ 0ET[

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practi ce or Disciplinary Core Idea.

The text in the “Disciplinary Core Ideas” section is reproduced verbatim from A Framew525(ry)1(i)3(Td [(c-6Yc 0.00)0.59(K]TJ 0 Tcw35.6480 Td (-)Tj 00.006 Tc 0.014 Tw 60.3 0 Td [(c12)1(FS)-(c)-5(e)3(en)-8(c)-2(e)1

HS. Waves and Electromagnetic Radiation

Students who demonstrate understanding can:

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practi ce or Disciplinary Core Idea.
The text in the "Disciplinary Core Ideas" section is reproduced verbatim from A Framework for K-12 Science Education: Practices, CrossCutting Concepts, and Core Ideas unless it is preceded by (NYSED).

Connection to Nature of Science Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena @ $ VFLHQWLILF WKHRU\ LV D VXEVWD aspect of the natural world, based on a body of facts that have been repeatedly confirmed through observation and experiment and the science community validates each theory before it is accepted. If new evidence is discovered that the theory does not accommodate, the theory is generally modified in light of this new evidence. (HS-PS4-3)	(HS-PS4-4) ƒ Photoelectric materials emit electrons when they absorb light of a high-enough frequency. (HS-PS4-5) PS4.C: Information Technologies and Instrumentation ƒ Multiple technologies based on the understanding of waves and their interactions with matter are part of everyday experiences in the modern world (e.g., medical imaging, communications, scanners) and in scientific research. They are essential tools for producing, transmitting, and capturing signals and for storing and interpreting the information contained in them. (HS-PS4-5)	Influence of Engineering, Technology, and Science on Society and the Natural World ƒ Modern civilization depends on

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.
The text in the "Disciplinary Core Ideas" section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas unless it is preceded by (NYSED).

explanation. (HS-LS2-6),(HS-LS2-8)	ETS1.B: Developing Possible Solutions ƒ When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts. (secondary to HS-LS2-7)	
Connections to other DCIs in this grade-band: HS.ESS2.D (HS-LS2-7),(HS-LS4-6); HS.ESS2.E (HS-LS2-2),(HS-LS2-6),(HS-LS2-7),(HS-LS4-6); HS.ESS3.A (HS-LS2-2),(HS-LS2-7),(HS-LS4-6); HS.ESS3.C (HS-LS2-2),(HS-LS2-7),(HS-LS4-6); HS.ESS3.D (HS-LS2-2),(HS-LS4-6)		

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.
The text in the "Disciplinary Core Ideas" section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas unless it is preceded by (NYSED).

	LS3-2) ƒ (NYSED) Advances in biotechnology have allowed organisms to be modified genetically. (HS-LS3-2) ƒ Environmental factors also affect expression of traits, and hence affect the probability of occurrences of traits in a population. Thus the variation and distribution of traits observed depends on both genetic and environmental factors. (HS-LS3-2),(HS-LS3-

24.64 2153-1406.7E44re W nba6 re 5-

HS. Natural Selection and Evolution

Students who demonstrate understanding can:

HS-LS4-1. Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. [Clarification Statement: Emphasis is on a conceptual understanding of the role each line of evidence has relating to common ancestry and biological evolution. Examples of evidence could include similarities in DNA sequences, anatomical structures, and order of appearance of structures in

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.
The text in the "Disciplinary Core Ideas" section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas unless it is preceded by (NYSED).

T41

Students who demonstrate understanding can:

HS-ESS1-1. Develop a model based on evidence to illustrate the life span of the Sun and the role of nuclear fusion in the e-Tw r0.547g5(ce y152 /P [(t)-103.7(he)]TJ 0 Tc 0 Tw 1.933 0 Td ( )Tj -0.013 Tcw 0.-8(nd [(s)-21(pa)-17.2(d)]TJ 0 Tc 06)Tj 4

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practi ce or Disciplinary Core Idea.
The text in the "Disciplinary Core Ideas" section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas unless it is preceded by (NYSED).

Connections to Nature of Science Scientific Knowledge is Based on Empirical Evidence ƒ Science knowledge is based on empirical evidence. (HS ESS23) ƒ Science disciplines share common rules of evidence used to evaluate explanations about natural systems. (HS-ESS23) Science includes the process of coordinating patterns of evidence with current theory. (HS -ESS23)	ƒ The foundation for Earth's global climate systems is the electromagnetic radiation from the sun, as well as its reflection, absorption, storage, and redistribution among the atmosphere, ocean, and land systems, and this energy's re-radiation into space. (HS-ESS22) ƒ Gradual atmospheric changes were due to plants and other organisms that captured carbon dioxide and released oxygen. (HS-ESS26),(HS-ESS27) ƒ Changes in the atmosphere due to human activity have increased carbon dioxide concentrations and thus affect climate. (HS-ESS26) ESS2.E: Biogeology ƒ The many dynamic and delicate feedbacks between the biosphere and other Earth systems cause a continual co-evolution of Earth's surface and the life that exists on it. (HS-ESS27) PS4.A: Wave Properties ƒ

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practi ce or Disciplinary Core Idea.
The text in the "Disciplinary Core Ideas" section is reproduced verbatim from A Framework for K-12 Science Education: Practices, CrossCutting Concepts, and Core Ideas unless it is preceded by (NYSED).

HS. Human Sustainability

Students who demonstrate understanding can:

HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. [Clarification Statement: Examples of key natural resources include access to freshwater (such as rivers, lakes, and groundwater), regions of fertile soils such as river deltas, and high concentrations of minerals and fossil fuels. Examples of natural hazards can be from interior processes (such as volcanic eruptions and earthquakes), [illegible]

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.
The text in the "Disciplinary Core Ideas" section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas unless it is preceded by (NYSED).

and sufficient evidence and scientific reasoning to defend and critique claims and explanations about natural and designed world(s). Arguments may also come from current scientific or historical episodes in science. ƒ Evaluate competing design solutions to a real-world problem based on scientific ideas and principles, empirical evidence, and logical arguments regarding relevant factors (e.g. economic, societal, environmental, ethical considerations). (HS-ESS3-2)	account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts. (secondary to HS-ESS3-2),(secondary to HS-ESS3-4)	ƒ Scientific knowledge is a result of human endeavors, imagination, and creativity. (HS-ESS3-3) Science Addresses Questions About the Natural and Material World ƒ Science and technology may raise ethical issues for which science, by itself, does not provide answers and solutions. (HS-ESS3-2) ƒ Science knowledge indicates what can happen in natural systems—not what should happen. The latter involves ethics, values, and human decisions about the use of knowledge. (HS-ESS3-2) ƒ Many decisions are not made using science alone, but rely on social and cultural contexts to resolve issues. (HS-ESS3-2)
Connections to other DCIs in this grade-band: HS.PS1.B (HS-ESS3-3); HS.PS3.B (HS-ESS3-2); HS.PS3.D (HS-ESS3-2); HS.LS2.A (HS-ESS3-2),(HS-ESS3-3); HS.LS2.B (HS-ESS3-2),(HS-ESS3-3),(HS-ESS3-6); HS.LS2.C (HS-ESS3-3),(HS-ESS3-4),(HS-ESS3-6); HS.LS4.D (HS-ESS3-2),(HS-ESS3-3),(HS-ESS3-4),(HS-ESS3-6); HS.ESS2.A (HS-ESS3-2),(HS-ESS3-3),(HS-ESS3-6); HS.ESS2.E (HS-ESS3-3)		

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.
The text in the "Disciplinary Core Ideas" section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas unless it is preceded by (NYSED).