Standard	Description	Correlation	Type
NGSS-ELA	**English Language Arts and Literacy**		
NGSS-ELA-RST.11-12	**Reading Standards for Literacy in Science and Technical Subjects 11-12**		
NGSS-ELA-RST.11-12-1	Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.	p. 231, #33 p. 647, #8 p. 662, #45 p. 231, #33 p. 647, #8 p. 662, #45	SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess
NGSS-ELA-RST.11-12-7	Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.	p. 558, ¶7 p. 275, #40 p. 407, #35 p. 822, #51 p. 275, #40 p. 407, #35 p. 822, #51	SB Content SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess
NGSS-ELA-RST.11-12-8	Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.	p. 231, #33 p. 662, #39 p. 727, #22 p. 231, #33 p. 662, #39 p. 727, #22	SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess
NGSS-ELA-RST.9-10	**Reading Standards for Literacy in Science and Technical Subjects 9-10**		
NGSS-ELA-RST.9-10-1	Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.	p. 647, #8 p. 662, #39 p. 662, #45 p. 647, #8 p. 662, #39 p. 662, #45	SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess
NGSS-ELA-RST.9-10-7	Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.	p. 61, ¶1 p. 66, #63 p. 98, #14 p. 127, #7 p. 185, #3 p. 230, #26 p. 327, #11 p. 407, #35 p. 789, #30 p. 822, #56	SB Content SB Assess SB Assess SB Assess SB Assess SB Assess SB Assess SB Assess SB Assess SB Assess

		p. 66, #63	TE Assess
		p. 98, #14	TE Assess
		p. 127, #7	TE Assess
		p. 185, #3	TE Assess
		p. 230, #26	TE Assess
		p. 327, #11	TE Assess
		p. 407, #35	TE Assess
		p. 789, #30	TE Assess
		p. 822, #56	TE Assess
NGSS-ELA-RST.9-10-8	Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.	p. 25, ¶2	SB Content
		p. 822, #55	SB Assess
		p. 822, #55	TE Assess
NGSS-ELA-SL.11-12	**Speaking and Listening Standards 11-12**		
NGSS-ELA-SL.11-12-5	Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.	p. 29, ¶8	SB Content
		p. 275, #42	SB Assess
		p. 789, #42	SB Assess
		p. 275, #42	TE Assess
		p. 789, #42	TE Assess
NGSS-ELA-WHST.11-12	**Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 11-12**		
NGSS-ELA-WHST.11-12-8	Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.	p. 546, #62	SB Assess
		p. 727, #22	SB Assess
		p. 727, #23	SB Assess
		p. 823, #62	SB Assess
		p. 546, #62	TE Assess
		p. 727, #22	TE Assess
		p. 727, #23	TE Assess
		p. 823, #62	TE Assess
NGSS-ELA-WHST.9-10	**Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 9-10**		
NGSS-ELA-WHST.9-12-2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.	p. 727, #22	SB Assess
		p. 763, #2	SB Assess
		p. 789, #42	SB Assess
		p. 801, #1	SB Assess
		p. 807, #1	SB Assess
		p. 822, #47	SB Assess
		p. 727, #22	TE Assess
		p. 763, #2	TE Assess
		p. 789, #42	TE Assess
		p. 801, #1	TE Assess
		p. 807, #1	TE Assess
		p. 822, #47	TE Assess
NGSS-ELA-WHST.9-12-7	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.	p. 312, ¶1	SB Content
		p. 462, ¶2	SB Content
		p. 558, ¶1	SB Content
		p. 586, ¶1	SB Content
		p. 546, #62	SB Assess
		p. 823, #62	SB Assess
		p. 546, #62	TE Assess
		p. 823, #62	TE Assess
NGSS-ELA-WHST.9-12-9	Draw evidence from informational texts to support analysis, reflection,	p. 269, ¶10	SB Content

	and research.	p. 269, ¶7	SB Content
		p. 276, #59	SB Assess
		p. 276, #64	SB Assess
		p. 662, #45	SB Assess
		p. 695, #33	SB Assess
		p. 276, #59	TE Assess
		p. 276, #64	TE Assess
		p. 662, #45	TE Assess
		p. 695, #33	TE Assess
NGSS-HS-CC	**Crosscutting Concepts**		
NGSS-HS-CC-1	**Patterns.**		
NGSS-HS-CC-1-1	Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena.	p. 44, ¶2	SB Content
		p. 44, ¶3	SB Content
		p. 44, ¶5	SB Content
		p. 777, ¶10	SB Content
		p. 778, ¶2	SB Content
		p. 47, #5	SB Assess
		p. 787, #4	SB Assess
		p. 47, #5	TE Assess
		p. 787, #4	TE Assess
NGSS-HS-CC-2	**Cause and Effect: Mechanism and Explanation.**		
NGSS-HS-CC-2-1	Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.	p. 723, ¶2	SB Content
		p. 724, ¶2	SB Content
		p. 724, ¶5	SB Content
NGSS-HS-CC-2-2	Systems can be designed to cause a desired effect.	p. 312, ¶1	SB Content
		p. 462, ¶2	SB Content
		p. 586, ¶4	SB Content
NGSS-HS-CC-2-3	Cause and effect relationships can be suggested and predicted for compex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.	p. 13, ¶6	SB Content
		p. 14, ¶1	SB Content
		p. 352, ¶6	SB Content
		p. 724, ¶2	SB Content
NGSS-HS-CC-3	**Systems and System Models.**		
NGSS-HS-CC-3-1	**When investigating or describing a system, the boundaries and initial conditions of the system need to be defined and their inputs and outputs analyzed and described using models.**		
NGSS-HS-CC-3-1-1	When investigating or describing a system, the boundaries and initial conditions of the system need to be defined.	p. 371, ¶3	SB Content
		p. 397, ¶4	SB Content
		p. 421, ¶2	SB Content
		p. 421, ¶4	SB Content
NGSS-HS-CC-3-1-2	When investigating or describing a system, the inputs and outputs of the system need to be analyzed and described using models.	p. 748, ¶3	SB Content
NGSS-HS-CC-3-2	Models can be used to predict the behavior of a system, but these predictions have limited precision and reliability due to the assumptions and approximations inherent in models.	p. 85, ¶8	SB Content
		p. 157, ¶5	SB Content
		p. 296, ¶3	SB Content

NGSS-HS-CC-3-3	Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions--including energy, matter, and information flows--within and between systems at different scales.	p. 29, ¶4 p. 86, ¶7 p. 114, ¶1 p. 221, ¶2 p. 294, ¶2 p. 294, ¶4 p. 357, ¶2	SB Content SB Content SB Content SB Content SB Content SB Content SB Content
NGSS-HS-CC-4	**Energy and Matter: Flows, Cycles, and Conservation.**		
NGSS-HS-CC-4-1	In nuclear processes, atoms are not conserved, but the total number of protons plus neutrons is conserved.	p. 808, ¶4 p. 809, ¶5 p. 809, ¶6 p. 812, #6 p. 812, #7 p. 812, #6 p. 812, #7	SB Content SB Content SB Content SB Assess SB Assess TE Assess TE Assess
NGSS-HS-CC-4-2	Changes of energy and matter in a system can be described in terms of energy and matter [that] flows into, out of, and within that system.	p. 280, ¶4 p. 286, ¶3 p. 292, ¶5 p. 708, ¶2 p. 734, ¶2 p. 739, #4 p. 739, #4	SB Content SB Content SB Content SB Content SB Content SB Assess TE Assess
NGSS-HS-CC-4-3	Energy cannot be created or destroyed--[it] only moves between one place and another place, between objects and/or fields, or between systems.	p. 280, ¶1 p. 281, ¶1 p. 292, ¶2 p. 539, ¶7	SB Content SB Content SB Content SB Content
NGSS-HS-CC-5	**Stability and Change.**		
NGSS-HS-CC-5-1	Systems can be designed for greater or lesser stability.	p. 209, ¶4 p. 391, ¶1 p. 391, ¶8	SB Content SB Content SB Content
NGSS-HS-DCI	**Disciplinary Core Ideas**		
NGSS-HS-DCI-PS1.C	**Nuclear Processes**		
NGSS-HS-DCI-PS1.C-1	Nuclear processes, including fusion, fission, and radioactive decays of unstable nuclei, involve release or absorption of energy. The total number of neutrons plus protons does not change in any nuclear process.	N/A	
NGSS-HS-DCI-PS1.C-1-1	The nuclear process of fusion can involve the release or absorption of energy.	p. 809, ¶8 p. 811, ¶1 p. 812, #1 p. 812, #1	SB Content SB Content SB Assess TE Assess
NGSS-HS-DCI-PS1.C-1-2	The nuclear process of fission can involve the release or absorption of energy.	p. 810, ¶1 p. 810, ¶2 p. 812, #1 p. 812, #1	SB Content SB Content SB Assess TE Assess
NGSS-HS-DCI-PS1.C-1-3	The nuclear process of radioactive decay can involve the release or absorption of energy.	p. 802, ¶3 p. 802, ¶5	SB Content SB Content

		p. 803, ¶5	SB Content
		p. 803, ¶6	SB Content
		p. 807, #4	SB Assess
		p. 807, #4	TE Assess
NGSS-HS-DCI-PS1.C-1-4	The total number of neutrons plus protons does not change in any nuclear process.	p. 808, ¶4	SB Content
		p. 808, ¶5	SB Content
		p. 812, #6	SB Assess
		p. 812, #6	TE Assess
NGSS-HS-DCI-PS2.A	**Forces and Motion**		
NGSS-HS-DCI-PS2.A-1	Newton's second law accurately predicts changes in the motion of macroscopic objects.	N/A	
NGSS-HS-DCI-PS2.A-1-1	Newton's second law relates the acceleration of an object to its mass and the net force on it.	p. 143, ¶1	SB Content
		p. 144, ¶4	SB Content
		p. 164, #77	SB Assess
		p. 164, #80	SB Assess
		p. 164, #83	SB Assess
		p. 231, #36	SB Assess
		p. 164, #77	TE Assess
		p. 164, #80	TE Assess
		p. 164, #83	TE Assess
		p. 231, #36	TE Assess
NGSS-HS-DCI-PS2.A-1-2	Newton's second law accurately predicts changes in the motion of macroscopic objects.	p. 143, ¶6	SB Content
		p. 210, ¶4	SB Content
		p. 211, ¶8	SB Content
NGSS-HS-DCI-PS2.A-2	Momentum is defined for a particular frame of reference; it is the mass times the velocity of the object.	N/A	
NGSS-HS-DCI-PS2.A-2-1	Momentum is mass times the velocity of the object.	p. 308, ¶4	SB Content
		p. 309, ¶4	SB Content
		p. 309, ¶6	SB Content
		p. 329, #42	SB Assess
		p. 329, #43	SB Assess
		p. 329, #47	SB Assess
		p. 329, #42	TE Assess
		p. 329, #43	TE Assess
		p. 329, #47	TE Assess
NGSS-HS-DCI-PS2.A-2-2	Momentum is defined for a particular frame of reference.	p. 87, ¶3	SB Content
		p. 87, ¶7	SB Content
		p. 308, ¶7	SB Content
		p. 314, #9	SB Assess
		p. 329, #52	SB Assess
		p. 314, #9	TE Assess
		p. 329, #52	TE Assess
NGSS-HS-DCI-PS2.A-3	If a system interacts with objects outside itself, the total momentum of the system can change; however, any such change is balanced by changes in the momentum of objects outside the system.	p. 310, ¶6	SB Content
		p. 320, ¶5	SB Content
		p. 319, #4	SB Assess
		p. 330, #58	SB Assess
		p. 319, #4	TE Assess
		p. 330, #58	TE Assess
NGSS-HS-DCI-PS2.B	**Types of Interactions**		

NGSS-HS-DCI-PS2.B-1	**Newton's law of universal gravitation and Coulomb's law provide the mathematical models to describe and predict the effects of gravitational and electrostatic forces between distant objects.**		
NGSS-HS-DCI-PS2.B-1-1	Newton's law of universal gravitation provides the mathematical model to describe and predict the effects of the gravitational force between distant objects.	p. 216, ¶1 p. 216, ¶3 p. 218, ¶2 p. 228, #1 p. 228, #2 p. 232, #50 p. 228, #1 p. 228, #2 p. 232, #50	SB Content SB Content SB Content SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess
NGSS-HS-DCI-PS2.B-1-2	Coulomb's law provides the mathematical model to describe and predict the effects of the electrostatic force between distant objects.	p. 528, ¶1 p. 528, ¶5 p. 548, #100 p. 548, #106 p. 548, #107 p. 548, #100 p. 548, #106 p. 548, #107	SB Content SB Content SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess
NGSS-HS-DCI-PS2.B-2	**Forces at a distance are explained by fields (gravitational, electric, and magnetic) permeating space that can transfer energy through space. Magnets or electric currents cause magnetic fields; electric charges or changing magnetic fields cause electric fields.**		
NGSS-HS-DCI-PS2.B-2-1	Forces at a distance are explained by fields (gravitational, electric, and magnetic) permeating space that can transfer energy through space.	p. 517, ¶4 p. 530, ¶7 p. 531, ¶1 p. 552, ¶3 p. 636, ¶8 p. 522, #6 p. 576, #30 p. 579, #59 p. 522, #6 p. 576, #30 p. 579, #59	SB Content SB Content SB Content SB Content SB Content SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess
NGSS-HS-DCI-PS2.B-2-2	Magnets create magnetic fields.	p. 518, ¶1 p. 518, ¶4 p. 519, ¶2 p. 520, ¶2 p. 522, #6 p. 522, #6	SB Content SB Content SB Content SB Content SB Assess TE Assess
NGSS-HS-DCI-PS2.B-2-3	Electric currents create magnetic fields.	p. 552, ¶3 p. 553, ¶5 p. 553, ¶6 p. 554, ¶2 p. 579, #60 p. 576, #30 p. 579, #59 p. 576, #30 p. 579, #59 p. 579, #60	SB Content SB Content SB Content SB Content SB Content SB Assess SB Assess TE Assess TE Assess TE Assess
NGSS-HS-DCI-PS2.B-2-4	Electric charges create electric fields.	p. 530, ¶3	SB Content

		p. 531, ¶4	SB Content
		p. 547, #91	SB Assess
		p. 549, #120	SB Assess
		p. 547, #91	TE Assess
		p. 549, #120	TE Assess
NGSS-HS-DCI-PS2.B-2-5	Changing magnetic fields create electric fields.	p. 561, ¶3	SB Content
		p. 562, ¶4	SB Content
		p. 636, ¶8	SB Content
		p. 578, #51	SB Assess
		p. 640, #4	SB Assess
		p. 578, #51	TE Assess
		p. 640, #4	TE Assess
NGSS-HS-DCI-PS3.A	**Definitions of Energy**		
NGSS-HS-DCI-PS3.A-1	**Energy is a quantitative property of a system that depends on the motion and interactions of matter and radiation within that system. That there is a single quantity called energy is due to the fact that a system's total energy is conserved, even as, within the system, energy is continually transferred from one object to another and between its various possible forms.**		
NGSS-HS-DCI-PS3.A-1-1	Energy is a quantitative property of a system that depends on the motion of matter within that system.	p. 258, ¶1	SB Content
		p. 258, ¶4	SB Content
		p. 378, ¶4	SB Content
		p. 394, ¶5	SB Content
		p. 668, ¶5	SB Content
NGSS-HS-DCI-PS3.A-1-2	Energy is a quantitative property of a system that depends on the interactions of matter within that system.	p. 323, ¶1	SB Content
		p. 394, ¶4	SB Content
		p. 397, ¶4	SB Content
NGSS-HS-DCI-PS3.A-1-3	Energy is a quantitative property of a system that depends on the radiation within that system.	p. 708, ¶2	SB Content
		p. 767, ¶2	SB Content
		p. 768, ¶3	SB Content
		p. 803, ¶5	SB Content
NGSS-HS-DCI-PS3.A-1-4	A system's total energy is conserved.	p. 281, ¶1	SB Content
		p. 281, ¶6	SB Content
		p. 283, ¶3	SB Content
		p. 285, ¶4	SB Content
		p. 402, ¶2	SB Content
		p. 303, #37	SB Assess
		p. 303, #37	TE Assess
NGSS-HS-DCI-PS3.A-1-5	Energy can be continually transferred from one object to another and between its various possible forms within a system.	p. 394, ¶4	SB Content
		p. 402, ¶2	SB Content
		p. 736, ¶4	SB Content
NGSS-HS-DCI-PS3.A-2	At the macroscopic scale, energy manifests itself in multiple ways, such as in motion, sound, light, and thermal energy.	p. 256, ¶1	SB Content
		p. 264, ¶1	SB Content
		p. 416, ¶4	SB Content
		p. 673, ¶1	SB Content
NGSS-HS-DCI-PS3.A-3	**These relationships are better understood at the microscopic scale, at which all of the different manifestations of energy can be modeled as a combination of energy associated with the motion of particles and energy associated with the configuration (relative position of the particles). In some cases the relative position energy can be thought of as stored in**		

	fields (which mediate interactions between particles). This last concept includes radiation, a phenomenon in which energy stored in fields moves across space.		
NGSS-HS-DCI-PS3.A-3-1	At the microscopic scale, all of the different manifestations of energy can be modeled as a combination of energy associated with the motion of particles and energy associated with the configuration (relative position of the particles).	p. 668, ¶5 p. 670, ¶4 p. 685, ¶4 p. 765, ¶5 p. 767, ¶4 p. 798, ¶6	SB Content SB Content SB Content SB Content SB Content SB Content
NGSS-HS-DCI-PS3.A-3-2	In some cases the relative position energy can be thought of as stored in fields (which mediate interactions between particles).	p. 517, ¶4 p. 517, ¶5 p. 539, ¶7	SB Content SB Content SB Content
NGSS-HS-DCI-PS3.A-3-3	Radiation is a phenomenon in which energy stored in fields moves across space.	p. 636, ¶7 p. 653, ¶1 p. 659, ¶4	SB Content SB Content SB Content
NGSS-HS-DCI-PS3.A-4	**"Electrical energy" may mean energy stored in a battery or energy transmitted by electric currents.**		
NGSS-HS-DCI-PS3.A-4-1	"Electrical energy" may mean energy stored in a battery.	p. 266, ¶1 p. 479, ¶1 p. 479, ¶2	SB Content SB Content SB Content
NGSS-HS-DCI-PS3.A-4-2	"Electrical energy" may mean energy transmitted by electric currents.	p. 266, ¶2 p. 474, ¶3 p. 474, ¶4 p. 479, ¶2	SB Content SB Content SB Content SB Content
NGSS-HS-DCI-PS3.B	**Conservation of Energy and Energy Transfer**		
NGSS-HS-DCI-PS3.B-1	Conservation of energy means that the total change of energy in any system is always equal to the total energy transferred into or out of the system.	p. 289, ¶1 p. 292, ¶5 p. 734, ¶2 p. 768, ¶5 p. 798, ¶2	SB Content SB Content SB Content SB Content SB Content
NGSS-HS-DCI-PS3.B-2	Energy cannot be created or destroyed, but it can be transported from one place to another and transferred between systems.	N/A	
NGSS-HS-DCI-PS3.B-2-1	Energy cannot be created or destroyed.	p. 254, ¶3 p. 281, ¶2 p. 286, ¶3 p. 734, ¶2	SB Content SB Content SB Content SB Content
NGSS-HS-DCI-PS3.B-2-2	Energy can be transported from one place to another.	p. 264, ¶5 p. 474, ¶4 p. 563, ¶1 p. 705, ¶1 p. 706, ¶1	SB Content SB Content SB Content SB Content SB Content
NGSS-HS-DCI-PS3.B-2-3	Energy can be transferred between systems.	p. 293, ¶1 p. 563, ¶5 p. 704, ¶1	SB Content SB Content SB Content
NGSS-HS-DCI-PS3.B-3	**Mathematical expressions, which quantify how the stored energy in a system depends on its configuration (e.g., relative positions of charged particles, compression of a spring) and how kinetic energy depends on mass and speed, allow the concept of conservation of energy to**		

	be used to predict and describe system behavior.		
NGSS-HS-DCI-PS3.B-3-1	A mathematical expression can quantify how the stored energy in a system depends on its configuration.	p. 259, ¶3 p. 261, ¶2 p. 283, ¶3 p. 539, ¶7	SB Content SB Content SB Content SB Content
NGSS-HS-DCI-PS3.B-3-2	A mathematical expression can quantify how the kinetic energy in a system depends on mass and speed.	p. 258, ¶1 p. 258, ¶4 p. 283, ¶3 p. 263, #2 p. 263, #3 p. 275, #43 p. 275, #47 p. 263, #2 p. 263, #3 p. 275, #43 p. 275, #47	SB Content SB Content SB Content SB Assess SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess TE Assess
NGSS-HS-DCI-PS3.B-3-3	Mathematical expressions for the energy of a system allow the concept of conservation of energy to be used to predict and describe system behavior.	p. 283, ¶3 p. 284, ¶5 p. 323, ¶4	SB Content SB Content SB Content
NGSS-HS-DCI-PS3.B-4	The availability of energy limits what can occur in any system.	p. 286, ¶5 p. 654, ¶5	SB Content SB Content
NGSS-HS-DCI-PS3.B-5	Uncontrolled systems always evolve toward more stable states—that is, toward more uniform energy distribution (e.g., water flows downhill, objects hotter than their surrounding environment cool down).	p. 391, ¶1 p. 703, ¶1 p. 735, ¶1	SB Content SB Content SB Content
NGSS-HS-DCI-PS3.C	**Relationship Between Energy and Forces**		
NGSS-HS-DCI-PS3.C-1	When two objects interacting through a force field change relative position, the energy stored in the force field is changed.	p. 517, ¶5 p. 539, ¶11 p. 539, ¶7	SB Content SB Content SB Content
NGSS-HS-DCI-PS3.D	**Energy in Chemical Processes and Everyday Life**		
NGSS-HS-DCI-PS3.D-1	Solar cells are human-made devices that likewise capture the Sun's energy and produce electrical energy.	p. 27, ¶4 p. 27, ¶6 p. 28, ¶2 p. 29, ¶4	SB Content SB Content SB Content SB Content
NGSS-HS-DCI-PS4.A	**Wave Properties**		
NGSS-HS-DCI-PS4.A-1	**The wavelength and frequency of a wave are related to one another by the speed of travel of the wave, which depends on the type of wave and the medium through which it is passing.**		
NGSS-HS-DCI-PS4.A-1-1	The wavelength and frequency of a wave are related to one another by the speed of travel of the wave.	p. 415, ¶3 p. 447, ¶2 p. 637, ¶3	SB Content SB Content SB Content
NGSS-HS-DCI-PS4.A-1-2	The speed of travel of a wave depends on the type of wave.	p. 415, ¶5 p. 447, ¶1 p. 637, ¶2	SB Content SB Content SB Content
NGSS-HS-DCI-PS4.A-1-3	The speed of travel of a wave depends on the medium through which	p. 423, ¶2	SB Content

	it is passing.	p. 637, ¶5	SB Content
		p. 642, ¶4	SB Content
NGSS-HS-DCI-PS4.A-2	**Information can be digitized (e.g., a picture stored as the values of an array of pixels); in this form, it can be stored reliably in computer memory and sent over long distances as a series of wave pulses.**		
NGSS-HS-DCI-PS4.A-2-1	Information can be digitized.	p. 24, ¶2	SB Content
		p. 656, ¶5	SB Content
		p. 659, ¶1	SB Content
NGSS-HS-DCI-PS4.A-2-2	Digitized information can be stored reliably in computer memory.	p. 24, ¶4	SB Content
		p. 656, ¶5	SB Content
		p. 659, ¶1	SB Content
NGSS-HS-DCI-PS4.A-2-3	Digitized information can be sent over long distances as a series of wave pulses.	p. 433, ¶7	SB Content
		p. 659, ¶1	SB Content
NGSS-HS-DCI-PS4.A-3	**Waves can add or cancel one another as they cross, depending on their relative phase (i.e., relative position of peaks and troughs of the waves), but they emerge unaffected by each other.**		
NGSS-HS-DCI-PS4.A-3-1	Waves can add or cancel one another as they cross, depending on their relative phase (i.e., relative position of peaks and troughs of the waves).	p. 428, ¶1	SB Content
		p. 458, ¶5	SB Content
		p. 651, ¶6	SB Content
NGSS-HS-DCI-PS4.A-3-2	Interacting waves emerge unaffected by each other.	p. 410, ¶3	SB Content
		p. 428, ¶4	SB Content
NGSS-HS-DCI-PS4.B	**Electromagnetic Radiation**		
NGSS-HS-DCI-PS4.B-1	**Electromagnetic radiation (e.g., radio, microwaves, light) can be modeled as a wave of changing electric and magnetic fields or as particles called photons.**		
NGSS-HS-DCI-PS4.B-1-1	Electromagnetic radiation can be modeled as a wave of changing electric and magnetic fields.	p. 636, ¶6	SB Content
		p. 636, ¶8	SB Content
		p. 648, ¶4	SB Content
		p. 657, ¶3	SB Content
NGSS-HS-DCI-PS4.B-1-2	Electromagnetic radiation can be modeled as particles called photons.	p. 653, ¶6	SB Content
		p. 654, ¶5	SB Content
		p. 657, ¶4	SB Content
		p. 768, ¶3	SB Content
NGSS-HS-DCI-PS4.B-2	**The wave model is useful for explaining many features of electromagnetic radiation, and the particle model explains other features.**		
NGSS-HS-DCI-PS4.B-2-1	The wave model of light is useful for explaining many features of electromagnetic radiation.	p. 648, ¶5	SB Content
		p. 649, ¶5	SB Content
		p. 651, ¶3	SB Content
		p. 657, ¶3	SB Content
NGSS-HS-DCI-PS4.B-2-2	The particle model of light is useful for explaining many features of electromagnetic radiation.	p. 654, ¶5	SB Content
		p. 657, ¶1	SB Content
		p. 657, ¶4	SB Content
NGSS-HS-DCI-PS4.B-3	When light or longer wavelength electromagnetic radiation is absorbed in matter, it is generally converted into thermal energy	p. 646, ¶4	SB Content
		p. 706, ¶7	SB Content

	(heat).	p. 707, ¶2	SB Content
		p. 720, ¶1	SB Content
		p. 721, ¶5	SB Content
		p. 723, ¶1	SB Content
NGSS-HS-DCI-PS4.B-4	Short wavelength electromagnetic radiation (ultraviolet, X-rays, gamma rays) can ionize atoms and cause damage to living cells.	p. 433, ¶4	SB Content
		p. 646, ¶2	SB Content
		p. 817, ¶3	SB Content
NGSS-HS-DCI-PS4.B-5	Photoelectric materials emit electrons when they absorb light of a high-enough frequency.	p. 27, ¶6	SB Content
		p. 654, ¶3	SB Content
		p. 655, ¶2	SB Content
		p. 656, ¶5	SB Content
NGSS-HS-DCI-PS4.C	**Information Technologies and Instrumentation**		
NGSS-HS-DCI-PS4.C-1	**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.**		
NGSS-HS-DCI-PS4.C-1-1	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.	p. 433, ¶6	SB Content
		p. 433, ¶7	SB Content
		p. 445, ¶6	SB Content
		p. 448, ¶8	SB Content
NGSS-HS-DCI-PS4.C-1-2	Technologies based on the understanding of waves and their interactions with matter are essential tools for producing, transmitting, and capturing signals.	p. 403, ¶5	SB Content
		p. 624, ¶8	SB Content
		p. 658, ¶2	SB Content
		p. 658, ¶3	SB Content
NGSS-HS-DCI-PS4.C-1-3	Technologies based on the understanding of waves and their interactions with matter are essential tools for storing and interpreting the information contained in them.	p. 22, ¶5	SB Content
		p. 24, ¶2	SB Content
		p. 451, ¶6	SB Content
		p. 465, ¶3	SB Content
NGSS-HS-ETS	**Connections to Engineering, Technology, and Applications of Science**		
NGSS-HS-ETS-1.A	**Defining and Delimiting Engineering Problems**		
NGSS-HS-ETS-1.A-1	Criteria and constraints also include satisfying any requirements set by society, such as taking issues of risk mitigation into account, and they should be quantified to the extent possible and stated in such a way that one can tell if a given design meets them.	p. 20, ¶4	SB Content
		p. 244, ¶4	SB Content
		p. 248, ¶2	SB Content
		p. 313, ¶2	SB Content
		p. 313, ¶4	SB Content
		p. 814, ¶5	SB Content
		p. 817, ¶6	SB Content
NGSS-HS-ETS-CX1	**Modern civilization depends on major technological systems. Engineers continuously modify these technological systems by applying scientific knowledge and engineering design practices to increase benefits while decreasing costs and risks.**		
NGSS-HS-ETS-CX1-1-1	Modern civilization depends on major technological systems.	p. 271, ¶3	SB Content
		p. 293, ¶1	SB Content
		p. 555, ¶1	SB Content
		p. 659, ¶4	SB Content

NGSS-HS-ETS-CX1-1-2	Engineers continuously modify technological systems by applying scientific knowledge and engineering design practices to increase benefits while decreasing costs and risks.	p. 271, ¶5 p. 306, ¶4 p. 730, ¶4 p. 740, ¶3	SB Content SB Content SB Content SB Content
NGSS-HS-PS	**High School Physics: Performance Expectations**		
NGSS-HS-PS1	**Matter and Its Interactions. Students who demonstrate understanding can:**		
NGSS-HS-PS1-8	Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.	N/A	
NGSS-HS-PS1-8-1	Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the process of fission.	p. 812, #1 p. 812, #6 p. 812, #7 p. 820, #6 p. 812, #1 p. 812, #6 p. 812, #7 p. 820, #6	SB Assess SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess TE Assess
NGSS-HS-PS1-8-2	Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the process of fusion.	p. 812, #1 p. 812, #4 p. 820, #6 p. 812, #1 p. 812, #4 p. 820, #6	SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess
NGSS-HS-PS1-8-3	Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the process of radioactive decay.	p. 807, #2 p. 807, #3 p. 807, #4 p. 807, #5 p. 812, #5 p. 807, #2 p. 807, #3 p. 807, #4 p. 807, #5 p. 812, #5	SB Assess SB Assess SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess TE Assess TE Assess
NGSS-HS-PS2	**Motion and Stability: Forces and Interactions. Students who demonstrate understanding can:**		
NGSS-HS-PS2-1	Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.	p. 146, ¶6	SB Content
NGSS-HS-PS2-2	Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.	p. 327, #19 p. 328, #26 p. 329, #39 p. 330, #57 p. 330, #58 p. 327, #19 p. 328, #26 p. 329, #39 p. 330, #57 p. 330, #58	SB Assess SB Assess SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess TE Assess TE Assess

NGSS-HS-PS2-3	Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.	p. 312, ¶1 p. 312, ¶5 p. 312, ¶8 p. 312, ¶9	SB Content SB Content SB Content SB Content
NGSS-HS-PS2-4	Use mathematical representations of Newton's law of gravitation and Coulomb's law to describe and predict the gravitational and electrostatic forces between objects.	N/A	
NGSS-HS-PS2-4-1	Use mathematical representations of Newton's law of gravitation to describe and predict the gravitational force between objects.	p. 228, #1 p. 228, #2 p. 230, #26 p. 230, #27 p. 232, #50 p. 232, #51 p. 546, #76 p. 228, #1 p. 228, #2 p. 230, #26 p. 230, #27 p. 232, #50 p. 232, #51 p. 546, #76	SB Assess SB Assess SB Assess SB Assess SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess TE Assess TE Assess TE Assess TE Assess
NGSS-HS-PS2-4-2	Use mathematical representations of Coulomb's law to describe and predict the electrostatic force between objects.	p. 529, #3 p. 546, #69 p. 546, #70 p. 546, #76 p. 548, #108 p. 548, #107 p. 548, #100 p. 548, #105 p. 548, #106 p. 549, #118 p. 529, #3 p. 546, #76 p. 546, #70 p. 546, #69 p. 548, #100 p. 548, #105 p. 548, #106 p. 548, #107 p. 548, #108 p. 549, #118	SB Assess SB Assess SB Assess SB Assess SB Assess SB Assess SB Assess SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess TE Assess TE Assess TE Assess TE Assess TE Assess TE Assess TE Assess
NGSS-HS-PS2-5	Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.	N/A	
NGSS-HS-PS2-5-1	Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field.	p. 554, ¶2 p. 554, ¶3 p. 559, #3 p. 579, #60 p. 559, #3 p. 579, #60	SB Content SB Content SB Assess SB Assess TE Assess TE Assess
NGSS-HS-PS2-5-2	Plan and conduct an investigation to provide evidence that a changing magnetic field can produce an electric current.	p. 556, ¶4 p. 564, #3	SB Content SB Assess

		p. 564, #3	TE Assess
NGSS-HS-PS3	**Energy: Students who demonstrate understanding can:**		
NGSS-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.	p. 294, ¶2 p. 297, ¶2 p. 297, ¶3 p. 297, ¶4	SB Content SB Content SB Content SB Content
NGSS-HS-PS3-2	Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as either motions of particles or energy stored in fields.	p. 285, ¶6 p. 672, ¶2 p. 543, #2 p. 545, #42 p. 545, #52 p. 695, #39 p. 543, #2 p. 545, #42 p. 545, #52 p. 695, #39	SB Content SB Content SB Assess SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess TE Assess
NGSS-HS-PS3-3	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.	p. 480, ¶4 p. 480, ¶5 p. 480, ¶8 p. 558, ¶1 p. 558, ¶5 p. 558, ¶6	SB Content SB Content SB Content SB Content SB Content SB Content
NGSS-HS-PS3-4	Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).	p. 675, ¶2 p. 675, ¶3 p. 717, ¶3	SB Content SB Content SB Content
NGSS-HS-PS3-5	Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction.	N/A	
NGSS-HS-PS3-5-1	Develop and use a model of two objects interacting through electric fields to illustrate the forces between objects due to the interaction.	p. 526, ¶2 p. 526, ¶3 p. 532, ¶4 p. 536, #1 p. 548, #100 p. 548, #105 p. 549, #118 p. 536, #1 p. 548, #100 p. 548, #105 p. 549, #118	SB Content SB Content SB Content SB Assess SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess TE Assess
NGSS-HS-PS3-5-2	Develop and use a model of two objects interacting through electric fields to illustrate the changes in energy of the objects due to the interaction.	p. 517, ¶4 p. 526, ¶3 p. 539, ¶6 p. 539, ¶7 p. 543, #2 p. 543, #2	SB Content SB Content SB Content SB Content SB Assess TE Assess
NGSS-HS-PS3-5-3	Develop and use a model of two objects interacting through magnetic fields to illustrate the forces between objects due to the interaction.	p. 516, ¶2 p. 516, ¶3 p. 520, ¶2 p. 545, #35	SB Content SB Content SB Content SB Assess

		p. 547, #95	SB Assess
		p. 545, #35	TE Assess
		p. 547, #95	TE Assess
NGSS-HS-PS3-5-4	Develop and use a model of two objects interacting through magnetic fields to illustrate the changes in energy of the objects due to the interaction.	p. 512, ¶3	SB Content
		p. 516, ¶2	SB Content
		p. 517, ¶5	SB Content
		p. 545, #42	SB Assess
		p. 545, #52	SB Assess
		p. 545, #42	TE Assess
		p. 545, #52	TE Assess
NGSS-HS-PS4	**Waves and Their Applications in Technologies for Information Transfer. Students who demonstrate understanding can:**		
NGSS-HS-PS4-1	Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.	p. 413, ¶2	SB Content
		p. 443, ¶2	SB Content
		p. 469, #51	SB Assess
		p. 640, #6	SB Assess
		p. 469, #51	TE Assess
		p. 640, #6	TE Assess
NGSS-HS-PS4-2	Evaluate questions about the advantages of using a digital transmission and storage of information.	N/A	
NGSS-HS-PS4-2-1	Evaluate questions about the advantages of using digital transmission of information.	p. 34, #71	SB Assess
		p. 660, #5	SB Assess
		p. 34, #71	TE Assess
		p. 660, #5	TE Assess
NGSS-HS-PS4-2-2	Evaluate questions about the advantages of using digital storage of information.	p. 34, #71	SB Assess
		p. 456, #3	SB Assess
		p. 34, #71	TE Assess
		p. 456, #3	TE Assess
NGSS-HS-PS4-3	Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.	p. 660, #1	SB Assess
		p. 663, #57	SB Assess
		p. 664, #76	SB Assess
		p. 665, #91	SB Assess
		p. 665, #92	SB Assess
		p. 665, #94	SB Assess
		p. 660, #1	TE Assess
		p. 663, #57	TE Assess
		p. 664, #76	TE Assess
		p. 665, #91	TE Assess
		p. 665, #92	TE Assess
		p. 665, #94	TE Assess
NGSS-HS-PS4-4	Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.	p. 647, #8	SB Assess
		p. 662, #39	SB Assess
		p. 647, #8	TE Assess
		p. 662, #39	TE Assess
NGSS-HS-PS4-5	Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.	p. 434, #2	SB Assess
		p. 450, #2	SB Assess
		p. 647, #2	SB Assess
		p. 662, #40	SB Assess
		p. 662, #44	SB Assess
		p. 662, #45	SB Assess
		p. 434, #2	TE Assess

		p. 434, #2	TE Assess
		p. 450, #2	TE Assess
		p. 647, #2	TE Assess
		p. 662, #40	TE Assess
		p. 662, #44	TE Assess
		p. 662, #45	TE Assess
NGSS-HS-SEP	**Science and Engineering Practices**		
NGSS-HS-SEP-1	**Asking Questions and Defining Problems. Asking questions and defining problems in grades 9-12 builds from grades K-8 experiences and progresses to formulating, refining, and evaluating empirically testable questions and design problems using models and simulations.**		
NGSS-HS-SEP-1-1	Evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.	N/A	
NGSS-HS-SEP-1-1-1	Evaluate questions that challenge the premise(s) of an argument.	p. 12, ¶6	SB Content
		p. 25, ¶2	SB Content
		p. 30, #4	SB Assess
		p. 30, #4	TE Assess
NGSS-HS-SEP-1-1-2	Evaluate questions that challenge the interpretation of a data set.	p. 644, ¶3	SB Content
		p. 723, ¶4	SB Content
		p. 724, ¶3	SB Content
		p. 727, #22	SB Assess
		p. 727, #22	TE Assess
NGSS-HS-SEP-1-1-3	Evaluate questions that challenge the suitability of a design.	p. 29, ¶7	SB Content
		p. 357, ¶5	SB Content
		p. 480, ¶4	SB Content
		p. 726, #12	SB Assess
		p. 726, #12	TE Assess
NGSS-HS-SEP-2	**Developing and Using Models. Modeling in 9-12 builds on K-8 and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed worlds.**		
NGSS-HS-SEP-2-1	Develop a model based on evidence to illustrate the relationships between systems or between components of a system.	p. 248, ¶2	SB Content
		p. 708, ¶2	SB Content
NGSS-HS-SEP-3	**Planning and Carrying Out Investigations. Planning and carrying out investigations in 9-12 builds on K-8 experiences and progresses to include investigations that provide evidence for and test conceptual, mathematical, physical, and empirical models.**		
NGSS-HS-SEP-3-1	**Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.**		
NGSS-HS-SEP-3-1-1	Plan and conduct an investigation individually.	p. 86, ¶7	SB Content
		p. 520, ¶5	SB Content
NGSS-HS-SEP-3-1-2	Plan and conduct an investigation collaboratively.	p. 312, ¶10	SB Content
		p. 413, ¶4	SB Content
		p. 644, ¶3	SB Content
NGSS-HS-SEP-3-1-3	Plan and conduct an investigation, and in the design decide on types	p. 312, ¶5	SB Content

	of data needed.	p. 462, ¶3 p. 586, ¶7	SB Content SB Content
NGSS-HS-SEP-3-1-4	Plan and conduct an investigation, and in the design decide how much data are needed.	p. 586, ¶7	SB Content
NGSS-HS-SEP-3-1-5	Plan and conduct an investigation, and in the design decide the accuracy of data needed to produce reliable measurements.	p. 462, ¶7	SB Content
NGSS-HS-SEP-3-1-6	Plan and conduct an investigation, and in the design consider limitations on the precision of the data.	p. 50, ¶2	SB Content
NGSS-HS-SEP-4	**Analyzing and Interpreting Data. Analyzing data in 9-12 builds on K-8 and progresses to introducing more detailed statistical analysis, the comparison of data sets for consistency, and the use of models to generate and analyze data.**		
NGSS-HS-SEP-4-1	Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.	p. 113, ¶3 p. 462, ¶3	SB Content SB Content
NGSS-HS-SEP-5	**Using Mathematics and Computational Thinking. Mathematical and computational thinking at the 9-12 level builds on K-8 and progresses to using algebraic thinking and analysis, a range of linear and nonlinear functions including trigonometric functions, exponentials and logarithms, and computational tools for statistical analysis to analyze, represent, and model data. Simple computational simulations are created and used based on mathematical models of basic assumptions.**		
NGSS-HS-SEP-5-1	Create a computational model or simulation of a phenomenon, designed device, process, or system.	p. 59, ¶2 p. 86, ¶7 p. 462, ¶3	SB Content SB Content SB Content
NGSS-HS-SEP-5-2	**Use mathematical representations of phenomena or design solutions to describe and/or support claims and/or explanations.**		
NGSS-HS-SEP-5-2-1	Use mathematical representations of phenomena or design solutions to support claims and/or explanations.	p. 285, ¶6 p. 379, ¶4	SB Content SB Content
NGSS-HS-SEP-5-2-2	Use mathematical representations of phenomena to describe explanations.	p. 114, ¶1	SB Content
NGSS-HS-SEP-6	**Constructing Explanations and Designing Solutions. Constructing explanations and designing solutions in 9-12 builds on K-8 experiences and progresses to explanations and designs that are supported by multiple and independent student-generated sources of evidence consistent with scientific ideas, principles, and theories.**		
NGSS-HS-SEP-6-1	Apply scientific ideas to solve a design problem, taking into account possible unanticipated effects.	p. 312, ¶5 p. 462, ¶3 p. 480, ¶3	SB Content SB Content SB Content
NGSS-HS-SEP-6-2	**Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.**		
NGSS-HS-SEP-6-2-1	Design a solution to a complex real-world problem.	p. 29, ¶1 p. 219, ¶6 p. 248, ¶2 p. 357, ¶1	SB Content SB Content SB Content SB Content

		p. 775, ¶1	SB Content
NGSS-HS-SEP-6-2-2	Evaluate a solution to a complex real-world problem.	p. 29, ¶7 p. 248, ¶2 p. 357, ¶5 p. 462, ¶7 p. 775, ¶10	SB Content SB Content SB Content SB Content SB Content
NGSS-HS-SEP-6-2-3	Refine a solution to a complex real-world problem.	p. 29, ¶8 p. 248, ¶2 p. 462, ¶8 p. 775, ¶11	SB Content SB Content SB Content SB Content
NGSS-HS-SEP-6-2-4	Use scientific knowledge to design, evaluate, and/or refine a solution to a complex real-world problem.	p. 219, ¶6 p. 248, ¶2 p. 312, ¶5 p. 462, ¶3	SB Content SB Content SB Content SB Content
NGSS-HS-SEP-6-2-5	Use student-generated sources of evidence to design, evaluate, and/or refine a solution to a complex real-world problem.	p. 357, ¶3 p. 357, ¶5 p. 462, ¶3	SB Content SB Content SB Content
NGSS-HS-SEP-6-2-6	Use prioritized criteria to design, evaluate, and/or refine a solution to a complex real-world problem.	p. 29, ¶2 p. 248, ¶2 p. 357, ¶1	SB Content SB Content SB Content
NGSS-HS-SEP-6-2-7	Use tradeoff considerations to design, evaluate, and/or refine a solution to a complex real-world problem.	p. 29, ¶6 p. 248, ¶2 p. 586, ¶7	SB Content SB Content SB Content
NGSS-HS-SEP-7	**Engaging in Argument from Evidence. Engaging in argument from evidence in 9-12 builds on K-8 experiences and progresses to using appropriate and sufficient evidence and scientific reasoning to defend and critique claims and explanations about natural and designed worlds. Arguments may also come from current scientific or historical episodes in science.**		
NGSS-HS-SEP-7-1	Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.	p. 723, ¶4 p. 724, ¶3 p. 727, #22 p. 727, #24 p. 727, #22 p. 727, #24	SB Content SB Content SB Assess SB Assess TE Assess TE Assess
NGSS-HS-SEP-8	**Obtaining, Evaluating, and Communicating Information.**		
NGSS-HS-SEP-8-1	**Evaluate the validity and reliability of multiple claims that appear in scientific and technical texts or media reports, verifying the data when possible.**		
NGSS-HS-SEP-8-1-1	Evaluate the validity and reliability of multiple claims that appear in scientific and technical texts, verifying the data when possible.	p. 12, ¶5 p. 231, #33 p. 727, #23 p. 231, #33 p. 727, #23	SB Content SB Assess SB Assess TE Assess TE Assess
NGSS-HS-SEP-8-1-2	Evaluate the validity and reliability of multiple claims that appear in media reports, verifying the data when possible.	p. 25, ¶2 p. 25, ¶3 p. 34, #73 p. 34, #76 p. 662, #45 p. 34, #73	SB Content SB Content SB Assess SB Assess SB Assess TE Assess

		p. 34, #76	TE Assess
		p. 662, #45	TE Assess
NGSS-HS-SEP-8-2	**Communicate technical information or ideas (e.g., about the process of development and the design and performance of a proposed process or system) in multiple formats (including orally, graphically, textually, and mathematically).**		
NGSS-HS-SEP-8-2-1	Communicate technical information orally.	p. 29, ¶8 p. 269, ¶10 p. 269, ¶7 p. 312, ¶10	SB Content SB Content SB Content SB Content
NGSS-HS-SEP-8-2-2	Communicate technical information graphically.	p. 59, ¶4	SB Assess
NGSS-HS-SEP-8-2-3	Communicate technical information textually.	p. 29, ¶2 p. 462, ¶7 p. 775, ¶1	SB Content SB Content SB Content
NGSS-HS-SEP-8-2-4	Communicate technical information mathematically.	p. 462, ¶3	SB Content
NGSS-MATH	**Connections to State Standards for Mathematics**		
NGSS-MATH-HSA	**High School - Algebra**		
NGSS-MATH-HSA-CED	**Creating Equations**		
NGSS-MATH-HSA-CED.A	**Create equations that describe numbers or relationships.**		
NGSS-MATH-HSA-CED.A.1	Create equations and inequalities in one variable and use them to solve problems.	p. 317, ¶6 p. 164, #81 p. 319, #3 p. 664, #79 p. 164, #81 p. 319, #3 p. 664, #79	SB Content SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess
NGSS-MATH-HSA-CED.A.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	p. 59, ¶2 p. 432, ¶4 p. 68, #112 p. 127, #11 p. 470, #59 p. 68, #112 p. 127, #11 p. 470, #59	SB Content SB Content SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess
NGSS-MATH-HSA-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.	p. 61, ¶4 p. 81, ¶2 p. 118, ¶5 p. 62, ¶4 p. 100, #44 p. 438, #66 p. 100, #44 p. 438, #66	SB Content SB Content SB Content SB Assess SB Assess SB Assess TE Assess TE Assess
NGSS-MATH-HSA-SSE	**Seeing Structure in Expressions**		

NGSS-MATH-HSA-SSE.A	**Interpret the structure of expressions**		
NGSS-MATH-HSA-SSE.A.1	Interpret expressions that represent a quantity in terms of its context.	p. 110, ¶6 p. 115, ¶6 p. 127, #7 p. 163, #59 p. 662, #33 p. 727, #17 p. 127, #7 p. 163, #59 p. 662, #33 p. 727, #17	SB Content SB Content SB Assess SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess TE Assess
NGSS-MATH-HSA-SSE.B	**Write expressions in equivalent forms to solve problems.**		
NGSS-MATH-HSA-SSE.B.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.	p. 61, ¶4 p. 81, ¶2 p. 218, ¶5 p. 62, ¶4 p. 303, #36 p. 69, #122 p. 303, #36	SB Content SB Content SB Content SB Assess SB Assess TE Assess TE Assess
NGSS-MATH-HSF	**High School - Functions**		
NGSS-MATH-HSF-IF	**Interpreting Functions**		
NGSS-MATH-HSF-IF.C	**Analyze functions using different representations.**		
NGSS-MATH-HSF-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.	p. 59, ¶2 p. 462, ¶3 p. 130, #46 p. 547, #99 p. 130, #46 p. 547, #99	SB Content SB Content SB Assess SB Assess TE Assess TE Assess
NGSS-MATH-HSN	**High School - Number and Quantity**		
NGSS-MATH-HSN-Q	**Quantities**		
NGSS-MATH-HSN-Q.A	**Reason quantitatively and use units to solve problems.**		
NGSS-MATH-HSN-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	p. 54, ¶4 p. 92, ¶1 p. 135, ¶5 p. 143, ¶5 p. 97, #2 p. 97, #3 p. 153, #3 p. 489, #3 p. 97, #2 p. 97, #3 p. 153, #3 p. 489, #3	SB Content SB Content SB Content SB Content SB Assess SB Assess SB Assess SB Assess TE Assess TE Assess TE Assess TE Assess
NGSS-MATH-HSN-Q.A.2	Define appropriate quantities for the purpose of descriptive modeling.	p. 59, ¶4 p. 68, #110	SB Assess SB Assess

		p. 69, #121	SB Assess
		p. 68, #110	TE Assess
		p. 69, #121	TE Assess
NGSS-MATH-HSN-Q.A.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	p. 48, ¶1	SB Content
		p. 48, ¶5	SB Content
		p. 49, ¶2	SB Content
		p. 65, #32	SB Assess
		p. 65, #36	SB Assess
		p. 65, #40	SB Assess
		p. 66, #51	SB Assess
		p. 65, #32	TE Assess
		p. 65, #36	TE Assess
		p. 65, #40	TE Assess
		p. 66, #51	TE Assess
NGSS-MATH-HSS	**High School - Statistics and Probability**		
NGSS-MATH-HSS-ID	**Interpreting Categorical and Quantitative Data**		
NGSS-MATH-HSS-ID.A	**Summarize, represent, and interpret data on a single count or measurement variable.**		
NGSS-MATH-HSS-ID.A.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).	p. 15, ¶3	SB Content
		p. 58, ¶5	SB Content
		p. 59, ¶4	SB Assess
		p. 68, #112	SB Assess
		p. 68, #112	TE Assess
		p. 305, #62	TE Assess
NGSS-MATH-MP	**Standards for Mathematical Practice**		
NGSS-MATH-MP.2	Reason abstractly and quantitatively.	p. 89, ¶3	SB Content
		p. 216, ¶3	SB Content
		p. 291, ¶5	SB Content
		p. 97, #5	SB Assess
		p. 232, #49	SB Assess
		p. 304, #45	SB Assess
		p. 97, #5	TE Assess
		p. 232, #49	TE Assess
		p. 304, #45	TE Assess
NGSS-MATH-MP.4	Model with mathematics.	p. 85, ¶8	SB Content
		p. 115, ¶1	SB Content
		p. 117, ¶3	SB Content
		p. 146, ¶6	SB Content
		p. 196, ¶2	SB Content
		p. 127, #11	SB Assess
		p. 128, #17	SB Assess
		p. 153, #4	SB Assess
		p. 301, #1	SB Assess
		p. 127, #11	TE Assess
		p. 128, #17	TE Assess
		p. 153, #4	TE Assess
		p. 301, #1	TE Assess
NGSS-MATH-MP.5	Use appropriate tools strategically.	p. 45, ¶7	SB Content
		p. 50, ¶2	SB Content
		p. 59, ¶2	SB Content