

# ***Active Physics* Correlations to the Next Generation Science Standards**

The page numbers in this correlation represent each chapter in which students are being prepared to meet the *NGSS Performance Expectations* and the *Reading/Writing Standards for Literacy in Science and Technical Subjects*.



## Scientific and Engineering Practices

Practices:	Active Physics Location:
1. Asking questions (for science) and defining problems (for engineering)	<p>Chapter 1 - Chapter Challenge, pp. 2-7, 120-121                      Chapter 2 - Chapter Challenge, pp. 128-131, 248-249                      Chapter 3 - Chapter Challenge, pp. 256-259, 336-337                      Chapter 4 - Chapter Challenge, pp. 344-347, 472-473                      Chapter 5 - Chapter Challenge, pp. 480-483, 586-587                      Chapter 6 - Chapter Challenge, pp. 594-597, 702-703                      Chapter 7 - Chapter Challenge, pp. 710-713, 780-781                      Chapter 8 - Chapter Challenge, pp. 788-791, 894-895                      Chapter 9 - Chapter Challenge, pp. 902-905, 990-991</p>
2. Developing and using models	<p>Making use of models to develop deeper understanding of difficult concepts is emphasized throughout <i>Active Physics</i>. The "Investigate" sections have students creating physical or diagrammatic models to help illustrate events that are difficult to observe directly.</p> <p>Chapter 1 - pp. 9-11, 23-25, 34-36, 52-58, 75-77, 90-97, 105-109                      Chapter 2 - pp. 132-133, 145-147, 157-159, 174-176, 184-187, 198-200, 210-212, 220-222, 234-237                      Chapter 3 - pp. 260-262, 266-268, 277-278, 292-294, 304-305, 310-312, 321-323                      Chapter 4 - pp. 346-352, 360-363, 372-374, 382-384, 392-395, 406-410, 420-424, 436-438, 448-450, 458-460                      Chapter 5 - pp. 484-486, 492-496, 508-510, 518-520, 530-533, 538-541, 548-551, 558-561, 567-569, 577-578                      Chapter 6 - pp. 598-599, 606-609, 614-617, 623-624, 631-633, 644-646, 664-666, 678-680, 691-693                      Chapter 7 - pp. 714-717, 726-727, 734-736, 746-748, 756-758, 765-768                      Chapter 8 - pp. 792-794, 808-809, 817-820, 827-830, 840-846, 853-857, 862-866, 874-877, 883-886                      Chapter 9 - pp. 906-907, 912-914, 922-924, 932-934, 943-945, 956-959, 965-967, 972-974, 981-983</p>
3. Planning and carrying out investigations	<p>Students conduct investigations, analyze and interpret data, and present multiple potential solutions through inquiry based processes during the "Investigate" sections. Students connect the new information they are learning to what they already know.</p> <p>Chapter 1 - pp. 9-11, 23-25, 34-36, 52-58, 75-77, 90-90-97, 105-109                      Chapter 2 - pp. 132-135, 145-147, 157-159, 174-176, 184-187, 198-200, 210-212, 220-222, 234-237                      Chapter 3 - pp. 260-262, 266-268, 277-278, 292-294, 304-305, 310-312, 322-323                      Chapter 4 - pp. 348-352, 360-363, 372-374, 382-384, 392-395, 406-410, 420-424, 436-438, 448-450, 458-460                      Chapter 5 - pp. 484-486, 492-498, 508-510, 518-520, 530-533, 538-541, 548-551, 558-561, 567-569, 577-578                      Chapter 6 - pp. 598-600, 606-609, 614-617, 623-624, 631-633, 644-646, 664-666, 678-680, 691-693                      Chapter 7 - pp. 714-717, 726-727, 734-736, 746-748, 756-758, 765-768                      Chapter 8 - pp. 792-794, 808, 817-820, 827-830, 840-846, 853-857, 862-866, 874-877, 883-886                      Chapter 9 - pp. 906-907, 912-914, 922-924, 932-934, 943-945, 956-959, 965-967, 972-974, 981-983</p>
4. Analyzing and interpreting data	<p>Throughout <i>Active Physics</i>, students have multiple opportunities to analyze and interpret data and develop strong evidence to validate their findings. To complete the "Chapter Challenge," students are encouraged to rely on one another as a resource of information and design ideas.</p> <p>Chapter 1 - pp. 9-11, 23-25, 34-36, 52-58, 75-77, 90-90-97, 105-109                      Chapter 2 - pp. 132-135, 145-147, 157-159, 174-176, 184-187, 198-200, 210-212, 220-222, 234-237                      Chapter 3 - pp. 260-262, 266-268, 277-278, 292-294, 304-305, 310-312, 322-323                      Chapter 4 - pp. 348-352, 360-363, 372-374, 382-384, 392-395, 406-410, 420-424, 436-438, 448-450, 458-460                      Chapter 5 - pp. 484-486, 492-498, 508-510, 518-520, 530-533, 538-541, 548-551, 558-561, 567-569, 577-578                      Chapter 6 - pp. 598-600, 606-609, 614-617, 623-624, 631-633, 644-646, 664-666, 678-680, 691-693                      Chapter 7 - pp. 714-717, 726-727, 734-736, 746-748, 756-758, 765-768                      Chapter 8 - pp. 792-794, 808, 817-820, 827-830, 840-846, 853-857, 862-866, 874-877, 883-886                      Chapter 9 - pp. 906-907, 912-914, 922-924, 932-934, 943-945, 956-959, 965-967, 972-974, 981-983</p>

<p>5. Using mathematics and computational thinking</p>	<p><i>Active Physics</i> challenges students mathematical and computational thinking as they analyze data within each "Investigate" activity. (Examples: pp. 9-11, 23-25, 34-36, 52-58, 75-77, 90-90-97, 105-109.) The "Physics Talk" feature requires students to analyze graphs, data charts, equations and diagrammatic models to develop conceptual understanding of the content. The "Physics To Go" and "Practice Tests" provides students with practice in mathematical skills.</p> <p>Chapter 1 - pp. 12-13, 19, 25-27, 32, 37-46, 49-51, 58-64, 68, 78-82, 88, 98-100, 103-104, 109-110, 114-115  Chapter 2 - pp. 134-138, 143-144, 148-151, 154-156, 160-167, 171-173, 177-178, 182-183, 188-189, 194-195, 201-205, 208, 212-214, 218-219, 222-227, 232-233, 237-241, 244-245  Chapter 3 - pp. 263, 265, 268-271, 274-275, 279-287, 290-291, 294-297, 299, 306-307, 309, 312-315, 319-320, 324-329, 332  Chapter 4 - pp. 353-354, 358-359, 363-367, 370-371, 374-377, 380-381, 385-387, 390-391, 396-399, 402-403, 410-415, 418-419, 425-429, 433-435, 439-442, 446-447, 450-453, 456-457, 460-464  Chapter 5 - pp. 486-487, 490-491, 498-502, 505-507, 510-514, 517, 521-523, 526-527, 533-534, 537, 541-543, 546, 551-552, 555-557, 561-562, 565-566, 570-571, 574-575, 579-580, 583  Chapter 6 - pp. 600-601, 604-605, 609-610, 612-613, 617-618, 621-622, 625-626, 629-630, 633-638, 641-643, 646-654, 658-661, 666-672, 676-677, 680-682, 686-689, 693-695, 698-699  Chapter 7 - pp. 717-720, 724-725, 727-729, 732, 736-739, 742-743, 748-751, 754-755, 758-762, 764, 768-771, 775-776  Chapter 8 - pp. 795-800, 805-807, 810-812, 815-816, 820-823, 825-826, 831-834, 837, 846-849, 851-852, 858, 860-861, 866-867, 871-872, 877-878, 881-882, 887, 890-891  Chapter 9 - pp. 908, 911, 915-916, 919-921, 924-927, 930-931, 935-937, 941-942, 945-948, 952, 959-961, 964, 968, 970-971, 975-976, 979, 980, 983-985, 987</p>
<p>6. Constructing explanations (for science) and designing solutions (for engineering)</p>	<p>Chapter 1 - Chapter Challenge, pp. 2-7, 120-121  Chapter 2 - Chapter Challenge, pp. 128-131, 248-249  Chapter 3 - Chapter Challenge, pp. 256-259, 336-337  Chapter 4 - Chapter Challenge, pp. 344-347, 472-473  Chapter 5 - Chapter Challenge, pp. 480-483, 586-587  Chapter 6 - Chapter Challenge, pp. 594-597, 702-703  Chapter 7 - Chapter Challenge, pp. 710-713, 780-781  Chapter 8 - Chapter Challenge, pp.788-791, 894-895  Chapter 9 - Chapter Challenge, pp. 902-905, 990-991</p>
<p>7. Engaging in argument from evidence</p>	<p>Chapter 1 - Chapter Challenge, pp. 2-7, 120-121  Chapter 2 - Chapter Challenge, pp. 128-131, 248-249  Chapter 3 - Chapter Challenge, pp. 256-259, 336-337  Chapter 4 - Chapter Challenge, pp. 344-347, 472-473  Chapter 5 - Chapter Challenge, pp. 480-483, 586-587  Chapter 6 - Chapter Challenge, pp. 594-597, 702-703  Chapter 7 - Chapter Challenge, pp. 710-713, 780-781  Chapter 8 - Chapter Challenge, pp. 788-791, 894-895  Chapter 9 - Chapter Challenge, pp. 902-905, 990-991</p>
<p>8. Obtaining, evaluating, and communicating information</p>	<p>In every chapter, the "Chapter Challenge" and "Chapter Mini-Challenge" culminate with a public presentation and communication of ideas, findings, data, and recommendations. Students present their ideas and scientific findings with the use of a poster, chart, diagram, model, play, or skit.</p> <p>Chapter 1 - Chapter Challenge and Chapter Mini-Challenge, pp. 2-7, 72-74, 120-121  Chapter 2 - Chapter Challenge and Chapter Mini-Challenge, pp. 128-131, 196-197, 248-249  Chapter 3 - Chapter Challenge and Chapter Mini-Challenge, pp. 256-259, 302-303, 336-337  Chapter 4 - Chapter Challenge and Chapter Mini-Challenge, pp. 344-347, 404-405, 472-473  Chapter 5 - Chapter Challenge and Chapter Mini-Challenge, pp. 480-483, 528-529, 586-587  Chapter 6 - Chapter Challenge and Chapter Mini-Challenge, pp. 594-597, 662-663, 702-703  Chapter 7 - Chapter Challenge and Chapter Mini-Challenge, pp. 710-713, 744-745, 780-781  Chapter 8 - Chapter Challenge and Chapter Mini-Challenge, pp. 788-791, 838-839, 894-895  Chapter 9 - Chapter Challenge and Chapter Mini-Challenge, pp. 902-905, 954-955, 990-991</p>

## Crosscutting Concepts

Concepts:	<i>Active Physics</i> Location:
1. Patterns	<p><i>Active Physics</i> provides ample opportunities for students to explore similarities and diversity in natural events and observable phenomenon. Pattern recognition as well as graphical representation of data help students develop an understanding of patterns on several time and size scales.</p> <p>Chapter 1 - pp. 52-64            Chapter 2 - pp. 157-169, 184-189            Chapter 3 - pp. 310-315            Chapter 4 - pp. 360-367, 448-453            Chapter 5 - pp. 484-487, 492-502, 508-514, 518-524, 577-580            Chapter 6 - pp. 664-672            Chapter 7 - pp. 765-771            Chapter 8 - pp. 862-867</p>
2. Cause and effect	<p>The <i>Active Physics</i> program provides ample opportunity for students to explore how the events of the natural world have understandable causes at several size and time scales. Cause and Effect is a primary concept found in chapters "Physics in Action," "Safety," and "Sports on the Moon."</p> <p>Chapter 1 - pp. 52, 75            Chapter 2 - pp. 132, 157, 174, 198, 210, 220, 234            Chapter 3 - pp. 260, 266, 277, 292, 304, 310, 321            Chapter 4 - pp. 348, 360, 372, 382, 406, 420, 448            Chapter 5 - pp. 482, 508, 567            Chapter 6 - pp. 644            Chapter 7 - pp. 714            Chapter 8 - pp. 792, 883            Chapter 9 - pp. 912, 922, 932, 943, 956, 965, 972, 981.</p>
3. Scale, proportion, and quantity	<p>Scale, proportion and quantity are emphasized throughout the <i>Active Physics</i> program as students deepen their understanding of time, size, energy, ratios and the mathematical relationship between disparate events. Change over time and relative scales of the very large and very small are explored by student graphical representation of data.</p> <p>Chapter 1 - pp. 34-46, 52-65, 90-100            Chapter 2 - pp. 132-142, 157-173, 174-183, 184-189, 210-216, 220-227, 234-241            Chapter 3 - pp. 266-271, 277-285, 292-298            Chapter 4 - pp. 348-356, 360-368, 372-378, 382-389, 406-417, 420-430, 436-446, 448-453            Chapter 5 - pp. 484-487, 492-502, 508-514, 518-524, 538-557, 567-576            Chapter 6 - pp. 606-612, 623-643, 678-690,            Chapter 7 - pp. 714-720, 746-755, 765-771            Chapter 8 - pp. 792-800, 808-826, 862-867, 883-891</p>

4. Systems and system models	<p>A wide range of activities throughout <i>Active Physics</i> support the concept of systems and system models. Students develop increasingly sophisticated ability to organize related groups of objects or events into interactions within the whole. They analyze the forces acting on the system as well as matter and energy flowing through the system.</p> <p>Chapter 1 - pp. 34-46, 52-65, 90-100  Chapter 2 - pp. 132-142, 157-173, 174-183, 184-189, 210-216, 220-227, 234-241  Chapter 3 - pp. 260-265, 266-271, 277-285, 292-298  Chapter 4 - pp. 304-309, 348-356, 360-368, 372-378, 382-389, 406-417, 420-430, 436-446, 448-453  Chapter 5 - pp. 484-487, 492-502, 508-514, 518-524, 538-557, 567-576  Chapter 6 - pp. 606-612, 623-643  Chapter 7 - pp. 714-720, 746-755, 765-771  Chapter 8 - pp. 792-800, 808-826, 862-867, 883-891  Chapter 9 - pp. 922-931, 956-964</p>
5. Energy and matter	<p>Students gain the ability to examine and model the transfer of energy through natural systems in several <i>Active Physics</i> chapters. Inputs, outputs, flows, and transfers of energy are examined in systems at various time and size scales.</p> <p>Chapter 1 - pp. 34-46, 52-65, 90-100  Chapter 2 - pp. 132-142, 157-173, 174-183, 184-189, 210-216, 220-227, 234-241  Chapter 3 - pp. 260-265, 266-271, 277-285, 292-298  Chapter 4 - pp. 304-309, 348-356, 360-368, 372-378, 382-389, 406-417, 420-430, 436-446, 448-453  Chapter 5 - pp. 484-487, 492-502, 508-514, 518-524, 538-557, 567-576  Chapter 6 - pp. 606-612, 623-643  Chapter 7 - pp. 714-720, 746-755, 765-771  Chapter 8 - pp. 792-800, 808-826, 862-867, 883-891  Chapter 9 - pp. 922-931, 956-964</p>
6. Structure and function	<p>Understanding the function of natural and built systems depends on the shapes and relationships of its parts as well as the properties of component material. Chapters, "Let Us Entertain You" and "Toys for Understanding," provide a particularly rich exposure to this concept as students explore musical instruments and electrical toys.</p> <p>Chapter 2 - pp. 174-183, 210-16, 220-227  Chapter 3 - pp. 277-285  Chapter 4 - pp. 372-378, 436-446  Chapter 5 - pp. 484-487, 492-502, 508-514, 518-524, 530-535, 538-557, 567-576, 577-580  Chapter 6 - pp. 614-618, 623-643, 644-654  Chapter 7 - pp. 714-720, 726-731, 746-755, 765-771  Chapter 8 - pp. 827-834, 853-858, 874-877  Chapter 9 - pp. 912-916, 965-970.</p>
7. Stability and change	<p>Stability and change of natural systems over short and long time scales, and macro, micro size scales is explored throughout the <i>Active Physics</i> program. Students are provided examples of feedback mechanisms that drive instability or control equilibrium as they deepen their understanding of this concept. A wide range of activities across the <i>Active Physics</i> chapters support the concept of stability and change.</p> <p>Chapter 1 - pp. 52-65, 75-77, 90-100  Chapter 2 - pp. 132-142, 145-155, 157-173, 174-183, 198-208, 210-216, 220-227, 234-241  Chapter 3 - pp. 260-265, 266-271, 277-285, 292-298  Chapter 4 - pp. 304-309, 310-315, 321-333, 348-356, 360-368, 372-378, 382-389, 392-399, 406-417, 420-430, 436-446, 448-453  Chapter 5 - pp. 492-502, 518-524, 567-576, 577-580  Chapter 6 - pp. 606-612, 664-672, 678-688  Chapter 7 - pp. 714-720, 726-731, 746-755  Chapter 8 - pp. 808-826, 827-834, 840-848, 862-867, 883-891  Chapter 9 - pp. 912-918, 922-931, 956-964, 965-964.</p>

## Performance Expectations

Expectations:	Active Physics Location:
HS. Structure and Properties	
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.	Preparation to meet this Performance Expectation can be found in <i>Active Chemistry</i> .
HS-PS1-3. Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Preparation to meet this Performance Expectation can be found in <i>Active Chemistry</i> .
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.	Chapter 8 - pp. 862-873, 874-882, 883-891
HS-PS2-6. Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.*	Preparation to meet this Performance Expectation can be found in <i>Active Chemistry</i> .
Expectations:	Active Physics Location:
HS. Chemical Reaction	
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 chemical properties.	Preparation to meet this Performance Expectation can be found in <i>Active Chemistry</i> .
HS-PS1-4. Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.	Preparation to meet this Performance Expectation can be found in <i>Active Chemistry</i> .
HS-PS1-5. Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.	Preparation to meet this Performance Expectation can be found in <i>Active Chemistry</i> .
HS-PS1-6. Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.*	Preparation to meet this Performance Expectation can be found in <i>Active Chemistry</i> .
HS-PS1-7. Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	Preparation to meet this Performance Expectation can be found in <i>Active Chemistry</i> .
Expectations:	Active Physics Location:
HS. Forces and Interactions	
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.	Chapter 2 - pp. 157-173 Chapter 3 - pp. 292-301 Chapter 4 - pp. 406-419 Chapter 9 - pp.922-931
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.	Chapter 3 - pp. 304-309, 310-320

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.*	Chapter 3 - pp. 321-333 Chapter 9 - pp. 956-964
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.	Chapter 4 - pp. 382-391 Chapter 8 - pp. 792-807 Chapter 9 - pp. 922-931
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.	Chapter 7 - pp. 714-725, 746-755, 765-777
<b>Expectations:</b>	<b>Active Physics Location:</b>
HS. Energy	
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.	Chapter 2 - pp. 234-243 Chapter 3 - pp. 277-291 Chapter 4 - pp. 360-371, 372-381 Chapter 6 - pp. 678-690 Chapter 8 - pp. 874-882, 883-891 Chapter 9 - pp. 943-952
HS-PS3-2. Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative position of particles (objects).	Chapter 2 - pp. 220-233 Chapter 6 - pp. 664-676 Chapter 8 - pp. 827-837
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.*	Chapter 4 - pp. 458-469 Chapter 6 - pp. 678-690, 691-697 Chapter 7 - pp. 734-743, 746-755
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).	Chapter 6 - pp. 664-676
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.	Chapter 4 - pp. 448-457 Chapter 7 - pp. 714-725 Chapter 8 - pp. 792-805
<b>Expectations:</b>	<b>Active Physics Location:</b>
HS. Waves and Electromagnetic Radiation	
HS-PS4-1. Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.	Chapter 5 - pp. 484-491, 492-507, 508-517, 518-527
HS-PS4-2. Evaluate questions about the advantages of using a digital transmission and storage of information.	Chapter 5 - pp. 571

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.	Chapter 7 - pp. 765-777 Chapter 8 - pp. 840-852
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.	Preparation to meet this Performance Expectation can be found in Active Chemistry .
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.*	Preparation to meet this Performance Expectation can be found in EarthComm .
<b>Expectations:</b>	<b>Active Physics Location:</b>
HS. Engineering Design	
HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.	Chapter 1 - pp. 2-7, 72-74, 120-121 Chapter 3 - pp. 256-259, 302-303, 336-337 Chapter 4 - pp. 344-347, 404-405, 472-473 Chapter 6 - pp. 594-597, 662-663 Chapter 7 - pp. 710-713, 744-745
HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.	Chapter 1 - pp. 2-7, 72-74, 120-121 Chapter 2 - pp. 128-131, 196-197, 248-249 Chapter 3 - pp. 256-259, 302-303, 336-337 Chapter 4 - pp. 344-347, 404-405, 472-473 Chapter 5 - pp. 480-483, 528-529, 586-587 Chapter 6 - pp. 594-597, 662-663 Chapter 7 - pp. 710-713, 744-745, 780-781 Chapter 8 - pp. 788-791, 838-839, 894-895 Chapter 9 - pp. 902-905, 954-955, 990-991
HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.	Chapter 3 - pp. 256-259, 302-303 Chapter 4 - pp. 344-347, 404-405
HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.	Chapter 1 - pp. 90-100



## Reading Standards for Literacy in Science and Technical Subjects: Grades 11-12

Standards:	Active Physics Location:
Key Ideas and Details	
<p>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>	<p>Every chapter in <i>Active Physics</i> provides students an opportunity to analyze science and technical concepts by citing evidence from their reading. The "What Do You Think Now," "Physics Essential Questions," and "Physics to Go" sections promote student understanding of the informational text.</p> <p>Chapter 1 - pp. 16-17, 19-20, 30-32, 48-51, 66-71, 86-89, 101-104, 112-115            Chapter 2 - pp. 141-144, 152-155, 170-173, 181-183, 192-195, 207-208, 216-219, 231-233, 242-245            Chapter 3 - pp. 264-265, 272-274, 288, 290-291, 298-299, 307-309, 317-320, 331-333            Chapter 4 - pp. 356-359, 369-371, 378-381, 389-391, 400-403, 417-419, 431-435, 444-447, 455-457, 466-469            Chapter 5 - pp. 489-491, 504-507, 515-517, 524-527, 536-537, 544-547, 554-557, 563-566, 573-575, 581-583            Chapter 6 - pp. 602-605, 611-613, 619-622, 627-630, 640-643, 656-661, 675-677, 684-689, 696-699            Chapter 7 - pp. 722-725, 731-732, 741-743, 753-755, 763-764, 774-776            Chapter 8 - pp. 803-807, 813-816, 823-826, 836-837, 850-852, 859-861, 870-873, 880-882, 889-891            Chapter 9 - pp. 910-911, 917-921, 928-931, 939-942, 951-952, 963-964, 969-971, 978-980, 986-987</p>
<p>2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p>	<p>Students determine the central ideas of informational text by answering the "Checking Up" questions in the "Physics Talk" section. These questions support the learning goals of each section and promote student understanding of the informational text.</p> <p>Chapter 1 - pp. 12-13, 25-27, 37-46, 58-64, 78-82, 98-100, 109-110            Chapter 2 - pp. 134-138, 148-151, 160-167, 177-178, 188-189, 201-205, 212-214, 222-227, 237-241,            Chapter 3 - pp. 263, 268-271, 279-287, 294-297, 306-307, 312-315, 324-329            Chapter 4 - pp. 353-354, 363-367, 374-377, 385-387, 396-399, 410-415, 433-435, 446-447, 456-457            Chapter 5 - pp. 486-487, 498-502, 510-514, 521-523, 533-534, 541-543, 551-552, 561-562, 570-571, 579-580            Chapter 6 - pp. 600-601, 609-610, 617-618, 625-626, 633-638, 646-654, 666-672, 680-682, 693-695            Chapter 7 - pp. 717-720, 727-729, 736-739, 748-751, 758-762, 768-771            Chapter 8 - pp. 795-800, 810-812, 820-823, 831-834, 846-849, 858, 866-867, 877-878, 887            Chapter 9 - pp. 908, 915-916, 924-927, 935-937, 945-948, 959-961, 968, 975-976, 975-976, 983-985</p>
<p>3. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>	<p>Chapter 1 - pp. 22-33, 34-51, 52-71, 75-89, 90-104, 105-117            Chapter 2 - pp. 145-156, 157-173, 174-183, 184-195, 198-209, 210-219, 220-233, 234-245            Chapter 3 - pp. 266-276, 277-291, 292-301, 304-309, 310-320, 321-333            Chapter 4 - pp. 360-371, 372-381, 382-391, 406-419, 420-435, 436-447, 448-457, 458-469            Chapter 5 - pp. 484-491, 492-507, 508-517, 518-527, 530-537, 538-547, 548-557, 558-566, 567-576, 577-583            Chapter 6 - pp. 614-622, 623-630, 631-643, 644-661, 664-677, 678-690, 691-699            Chapter 7 - pp. 726-733, 734-743, 744-745            Chapter 8 - pp. 792-807, 817-826            Chapter 9 - pp. 912-921, 922-931, 932-942, 965-971</p>

Craft and Structure	
<p>4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to <b>Grades 11-12 texts and topics</b>.</p>	<p>Key scientific and technical terms and domain specific words, or "Physics Words," are highlighted in the "Physics Talk" sections to promote student development of academic vocabulary.</p> <p>Chapter 1 - pp. 12-13, 25-27, 37-46, 58-64, 78-82, 98-100, 109-110  Chapter 2 - pp. 134-138, 148-151, 160-167, 177-178, 188-189, 201-205, 212-214, 222-227, 237-241,  Chapter 3 - pp. 263, 268-271, 279-287, 294-297, 306-307, 312-315, 324-329  Chapter 4 - pp. 353-354, 363-367, 374-377, 385-387, 396-399, 410-415, 433-435, 446-447, 456-457  Chapter 5 - pp. 486-487, 498-502, 510-514, 521-523, 533-534, 541-543, 551-552, 561-562, 570-571, 579-580  Chapter 6 - pp. 600-601, 609-610, 617-618, 625-626, 633-638, 646-654, 666-672, 680-682, 693-695  Chapter 7 - pp. 717-720, 727-729, 736-739, 748-751, 758-762, 768-771  Chapter 8 - pp. 795-800, 810-812, 820-823, 831-834, 846-849, 858, 866-867, 877-878, 887  Chapter 9 - pp. 908, 915-916, 924-927, 935-937, 945-948, 959-961, 968, 975-976, 975-976, 983-985</p>
<p>5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p>	<p>Every chapter provides students an opportunity to analyze the central ideas of informational text and demonstrate understanding of the ideas. The "Checking Up" questions in the "Physic Talk" section promotes student feedback on understanding and clarification of important ideas.</p> <p>Chapter 1 - pp. 12-13, 25-27, 37-46, 58-64, 78-82, 98-100, 109-110  Chapter 2 - pp. 134-138, 148-151, 160-167, 177-178, 188-189, 201-205, 212-214, 222-227, 237-241,  Chapter 3 - pp. 263, 268-271, 279-287, 294-297, 306-307, 312-315, 324-329  Chapter 4 - pp. 353-354, 363-367, 374-377, 385-387, 396-399, 410-415, 433-435, 446-447, 456-457  Chapter 5 - pp. 486-487, 498-502, 510-514, 521-523, 533-534, 541-543, 551-552, 561-562, 570-571, 579-580  Chapter 6 - pp. 600-601, 609-610, 617-618, 625-626, 633-638, 646-654, 666-672, 680-682, 693-695  Chapter 7 - pp. 717-720, 727-729, 736-739, 748-751, 758-762, 768-771  Chapter 8 - pp. 795-800, 810-812, 820-823, 831-834, 846-849, 858, 866-867, 877-878, 887  Chapter 9 - pp. 908, 915-916, 924-927, 935-937, 945-948, 959-961, 968, 975-976, 975-976, 983-985</p>
<p>6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.</p>	<p>At the conclusion of each learning section is "What Do You Think Now?," "Physics Essential Questions," and "Reflecting on the Section and the Challenge." These sections provide an opportunity for students to analyze their learning, discuss their investigations, summarize the important concepts, create an explanation for the natural phenomenon they have observed in the section and identify important information they still need to meet the "Chapter Challenge."</p> <p>Chapter 1 - pp. 16-17, 19-20, 30-32, 48-51, 66-71, 86-89, 101-104, 112-115  Chapter 2 - pp. 141-144, 152-155, 170-173, 181-183, 192-195, 207-208, 216-219, 231-233, 242-245  Chapter 3 - pp. 264-265, 272-274, 288, 290-291, 298-299, 307-309, 317-320, 331-333  Chapter 4 - pp. 356-359, 369-371, 378-381, 389-391, 400-403, 417-419, 431-435, 444-447, 455-457, 466-469  Chapter 5 - pp. 489-491, 504-507, 515-517, 524-527, 536-537, 544-547, 554-557, 563-566, 573-575, 581-583  Chapter 6 - pp. 602-605, 611-613, 619-622, 627-630, 640-643, 656-661, 675-677, 684-6890, 696-699  Chapter 7 - pp. 722-725, 731-732, 741-743, 753-755, 763-764, 774-776  Chapter 8 - pp. 803-807, 813-816, 823-826, 836-837, 850-852, 859-861, 870-873, 880-882, 889-891  Chapter 9 - pp. 910-911, 917-921, 928-931, 939-942, 951-952, 963-964, 969-971, 978-980, 986-987</p>

Integration of Knowledge and Ideas	
<p>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>	<p>Quantitative data, diagrams, simulations, and demonstrations are used extensively throughout <i>Active Physics</i> in the "Investigate" sections to help students visually understand complex concepts.</p> <p>Chapter 1 - pp. 9-11, 23-25, 34-36, 52-58, 75-77, 90-97, 105-109  Chapter 2 - pp. 132-133, 145-147, 157-159, 174-176, 184-187, 198-200, 210-212, 220-222, 234-237  Chapter 3 - pp. 260-262, 266-268, 277-278, 292-294, 304-305, 310-312, 321-323  Chapter 4 - pp. 346-352, 360-363, 372-374, 382-384, 392-395, 406-410, 420-424, 436-438, 448-450, 458-460  Chapter 5 - pp. 484-486, 492-496, 508-510, 518-520, 530-533, 538-541, 548-551, 558-561, 567-569, 577-578  Chapter 6 - pp. 598-599, 606-609, 614-617, 623-624, 631-633, 644-646, 664-666, 678-680, 691-693  Chapter 7 - pp. 714-717, 726-727, 734-736, 746-748, 756-758, 765-768  Chapter 8 - pp. 792-794, 808-809, 817-820, 827-830, 840-846, 853-857, 862-866, 874-877, 883-886  Chapter 9 - pp. 906-907, 912-914, 922-924, 932-934, 943-945, 956-959, 965-967, 972-974, 981-983</p>
<p>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>	<p>Throughout <i>Active Physics</i>, students investigate science concepts and observable phenomenon. In each case they gather and analyze data, form conclusions based on their hypothesis or predictions, and corroborate their findings with others in the class as well as their readings of science and technical text. Examples of supporting activities and readings can be found in every chapter.</p> <p>Chapter 1 - pp. 22-33, 34-51, 52-71, 75-89, 90-104, 105-117  Chapter 2 - pp. 145-156, 157-173, 174-183, 184-195, 198-209, 210-219, 220-233, 234-245  Chapter 3 - pp. 266-276, 277-291, 292-301, 304-309, 310-320, 321-333  Chapter 4 - pp. 360-371, 372-381, 382-391, 406-419, 420-435, 436-447, 448-457, 458-469  Chapter 5 - pp. 484-491, 492-507, 508-517, 518-527, 530-537, 538-547, 548-557, 558-566, 567-576, 577-583  Chapter 6 - pp. 614-622, 623-630, 631-643, 644-661, 664-677, 678-690, 691-699  Chapter 7 - pp. 726-733, 734-743, 744-745  Chapter 8 - pp. 792-807, 817-826  Chapter 9 - pp. 912-921, 922-931, 932-942, 965-971</p>
<p>9. Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p>	<p>In <i>Active Physics</i>, students investigate science concepts and observable phenomenon. They gather and analyze data from investigations and simulations, form conclusions based on their hypothesis or predictions, and corroborate their findings with others in the class as well as their readings of science and technical text. Examples of supporting activities and readings can be found in every chapter.</p> <p>Chapter 1 - pp. 22-33, 34-51, 52-71, 75-89, 90-104, 105-117  Chapter 2 - pp. 145-156, 157-173, 174-183, 184-195, 198-209, 210-219, 220-233, 234-245  Chapter 3 - pp. 266-276, 277-291, 292-301, 304-309, 310-320, 321-333  Chapter 4 - pp. 360-371, 372-381, 382-391, 406-419, 420-435, 436-447, 448-457, 458-469  Chapter 5 - pp. 484-491, 492-507, 508-517, 518-527, 530-537, 538-547, 548-557, 558-566, 567-576, 577-583  Chapter 6 - pp. 614-622, 623-630, 631-643, 644-661, 664-677, 678-690, 691-699  Chapter 7 - pp. 726-733, 734-743, 744-745  Chapter 8 - pp. 792-807, 817-826  Chapter 9 - pp. 912-921, 922-931, 932-942, 965-971</p>

Range of Reading and Level of Text Complexity

10. By the end of Grade 12, read and comprehend science/technical texts in the Grades 11-CCR text complexity band independently and proficiently.

"Physic Talk" is found within every *Section* of *Active Physics* and it promotes academic language and reading proficiency as students encounter increasingly complex informational text.

- Chapter 1 - pp. 12-13, 25-27, 37-46, 58-64, 78-82, 98-100, 109-110
- Chapter 2 - pp. 134-138, 148-151, 160-167, 177-178, 188-189, 201-205, 212-214, 222-227, 237-241,
- Chapter 3 - pp. 263, 268-271, 279-287, 294-297, 306-307, 312-315, 324-329
- Chapter 4 - pp. 353-354, 363-367, 374-377, 385-387, 396-399, 410-415, 433-435, 446-447, 456-457
- Chapter 5 - pp. 486-487, 498-502, 510-514, 521-523, 533-534, 541-543, 551-552, 561-562, 570-571, 579-580
- Chapter 6 - pp. 600-601, 609-610, 617-618, 625-626, 633-638, 646-654, 666-672, 680-682, 693-695
- Chapter 7 - pp. 717-720, 727-729, 736-739, 748-751, 758-762, 768-771
- Chapter 8 - pp. 795-800, 810-812, 820-823, 831-834, 846-849, 858, 866-867, 877-878, 887
- Chapter 9 - pp. 908, 915-916, 924-927, 935-937, 945-948, 959-961, 968, 975-976, 975-976, 983-985

## Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects: Grades 11-12

Standards:	Active Physics Location:
Text Types and Purposes	
1. Write arguments focused on discipline-specific content.	Students write content specific text when completing the "Chapter Challenge," "Investigate," "Checking Up," "Preparing for the Chapter Challenge," "Chapter Mini-Challenge," "Understanding and Applying," and "Inquiring Further" features in each <i>Section</i> . In their work, students develop claims, use content specific vocabulary, provide evidence, and generate concluding statements.
2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.	Students write informative/explanatory text containing domain specific language, transitions, and proper formatting when completing the "Chapter Challenge," "Preparing for the Chapter Challenge," "Chapter Mini-Challenge," and "Inquiring Further" sections. Students use domain specific vocabulary ("Physics Words") in their Active Physics Logs to present information, explanations, and answers to the "Investigate," "Checking Up," and "Understanding" and "Applying" sections.
3. Not applicable as a separate requirement.	N/A
Production and Distribution of Writing	
4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.	<p>Every chapter provides students with an opportunity to increase their writing skills using domain-specific vocabulary and diverse techniques to convey understanding of a topic. The "Checking Up" questions require students to respond in complete sentences using academic language to explain new knowledge. The "Physics to Go" questions offers critical thinking and offers students with more challenging writing opportunities to show knowledge of complex topics.</p> <p>Chapter 1 - pp. 12-13, 25-27, 37-46, 58-64, 78-82, 98-100, 109-110                      Chapter 2 - pp. 134-138, 148-151, 160-167, 177-178, 188-189, 201-205, 212-214, 222-227, 237-241,                      Chapter 3 - pp. 263, 268-271, 279-287, 294-297, 306-307, 312-315, 324-329                      Chapter 4 - pp. 353-354, 363-367, 374-377, 385-387, 396-399, 410-415, 433-435, 446-447, 456-457                      Chapter 5 - pp. 486-487, 498-502, 510-514, 521-523, 533-534, 541-543, 551-552, 561-562, 570-571, 579-580                      Chapter 6 - pp. 600-601, 609-610, 617-618, 625-626, 633-638, 646-654, 666-672, 680-682, 693-695                      Chapter 7 - pp. 717-720, 727-729, 736-739, 748-751, 758-762, 768-771                      Chapter 8 - pp. 795-800, 810-812, 820-823, 831-834, 846-849, 858, 866-867, 877-878, 887                      Chapter 9 - pp. 908, 915-916, 924-927, 935-937, 945-948, 959-961, 968, 975-976, 975-976, 983-985</p>
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.	<p>At the conclusion of each <i>Section</i> is "What Do You Think Now?," "Physics Essential Questions," and "Reflecting on the Section" and the "Challenge." These provide an opportunity for students to revisit their earlier thinking, rewrite previous statements, discuss their investigations, summarize the important concepts, create a revised explanation for the natural phenomenon they have observed, and identify important information they still need to meet the "Chapter Challenge."</p> <p>Chapter 1 - pp. 16-17, 19-20, 30-32, 48-51, 66-71, 86-89, 101-104, 112-115                      Chapter 2 - pp. 141-144, 152-155, 170-173, 181-183, 192-195, 207-208, 216-219, 231-233, 242-245                      Chapter 3 - pp. 264-265, 272-274, 288, 290-291, 298-299, 307-309, 317-320, 331-333                      Chapter 4 - pp. 356-359, 369-371, 378-381, 389-391, 400-403, 417-419, 431-435, 444-447, 455-457, 466-469                      Chapter 5 - pp. 489-491, 504-507, 515-517, 524-527, 536-537, 544-547, 554-557, 563-566, 573-575, 581-583                      Chapter 6 - pp. 602-605, 611-613, 619-622, 627-630, 640-643, 656-661, 675-677, 684-689, 696-699                      Chapter 7 - pp. 722-725, 731-732, 741-743, 753-755, 763-764, 774-776                      Chapter 8 - pp. 803-807, 813-816, 823-826, 836-837, 850-852, 859-861, 870-873, 880-882, 889-891                      Chapter 9 - pp. 910-911, 917-921, 928-931, 939-942, 951-952, 963-964, 969-971, 978-980, 986-987</p>
6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.	The use of the Internet is not required for <i>Active Physics</i> . However, the Internet can enhance and deepen a student's experience and is often used to complete the "Inquiring Further" section. Examples can be found: pp. 51, 183, 276, 359, 583, 622, 764, 873, 953

Research to Build and Present Knowledge	
<p>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>	<p>At the end of a <i>Section</i>, students have the opportunity to develop a sustained research project, create a self-generated question, or solve a problem in "Inquiring Further."</p> <p>Chapter 1 - pp. 20-21, 33, 51, 71, 89, 104, 115  Chapter 2 - pp. 144, 173, 183, 209, 219  Chapter 3 - pp. 265, 276, 291, 301  Chapter 4 - pp. 359, 371, 403, 419, 435, 447, 469  Chapter 5 - pp. 491, 507, 517, 527, 537, 547, 566, 576, 583  Chapter 6 - pp. 605, 622, 630, 643, 661, 690, 699  Chapter 7 - pp. 725, 732-733, 743, 755, 764, 777  Chapter 8 - pp. 816, 861, 873, 891  Chapter 9 - pp. 911, 921, 931, 942, 953, 964, 971, 980, 987</p>
<p>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>	<p>To complete each "Chapter Challenge," students must construct explanations about the physical phenomenon's and events observed. Students integrate information from various sources, investigations, readings, and their peers to prepare their presentations. They create posters, PowerPoint's, charts, graphs, skits, and plays to illustrate their recommendations, findings, ideas, and claims.</p> <p>Chapter 1 - Chapter Challenge and Chapter Mini-Challenge, pp. 2-7, 72-74, 120-121  Chapter 2 - Chapter Challenge and Chapter Mini-Challenge, pp. 128-131, 196-197, 248-249  Chapter 3 - Chapter Challenge and Chapter Mini-Challenge, pp. 256-259, 302-303, 336-337  Chapter 4 - Chapter Challenge and Chapter Mini-Challenge, pp. 344-347, 404-405, 472-473  Chapter 5 - Chapter Challenge and Chapter Mini-Challenge, pp. 480-483, 528-529, 586-587  Chapter 6 - Chapter Challenge and Chapter Mini-Challenge, pp. 594-597, 662-663, 702-703  Chapter 7 - Chapter Challenge and Chapter Mini-Challenge, pp. 710-713, 744-745, 780-781  Chapter 8 - Chapter Challenge and Chapter Mini-Challenge, pp. 788-791, 838-839, 894-895  Chapter 9 - Chapter Challenge and Chapter Mini-Challenge, pp. 902-905, 954-955, 990-991</p>
<p>9. Draw evidence from informational texts to support analysis, reflection, and research.</p>	<p>At the conclusion of each <i>Section</i> is "What Do You Think Now?," "Physics Essential Questions," and "Reflecting on the Section" and the "Challenge." These provide an opportunity for students to draw evidence from their investigations and informational text, summarize important concepts, create revised explanation for the natural phenomenon they have observed, and identify important information they still need to meet the "Chapter Challenge."</p> <p>Chapter 1 - pp. 16-17, 19-20, 30-32, 48-51, 66-71, 86-89, 101-104, 112-115  Chapter 2 - pp. 141-144, 152-155, 170-173, 181-183, 192-195, 207-208, 216-219, 231-233, 242-245  Chapter 3 - pp. 264-265, 272-274, 288, 290-291, 298-299, 307-309, 317-320, 331-333  Chapter 4 - pp. 356-359, 369-371, 378-381, 389-391, 400-403, 417-419, 431-435, 444-447, 455-457, 466-469  Chapter 5 - pp. 489-491, 504-507, 515-517, 524-527, 536-537, 544-547, 554-557, 563-566, 573-575, 581-583  Chapter 6 - pp. 602-605, 611-613, 619-622, 627-630, 640-643, 656-661, 675-677, 684-689, 696-699  Chapter 7 - pp. 722-725, 731-732, 741-743, 753-755, 763-764, 774-776  Chapter 8 - pp. 803-807, 813-816, 823-826, 836-837, 850-852, 859-861, 870-873, 880-882, 889-891  Chapter 9 - pp. 910-911, 917-921, 928-931, 939-942, 951-952, 963-964, 969-971, 978-980, 986-987</p>

Range of Writing

10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Every chapter provides students an opportunity to increase their skills in writing. The "Checking Up" and the "Physics to Go" questions require students to respond in complete sentences using academic language to explain new knowledge.

- Chapter 1 - pp. 12-13, 19, 25-27, 32, 37-46, 49-51, 58-64, 68, 78-82, 88, 98-100, 103-104, 109-110, 114-115
- Chapter 2 - pp. 134-138, 143-144, 148-151, 154-156, 160-167, 171-173, 177-178, 182-183, 188-189, 194-195, 201-205, 208, 212-214, 218-219, 222-227, 232-233, 237-241, 244-245
- Chapter 3 - pp. 263, 265, 268-271, 274-275, 279-287, 290-291, 294-297, 299, 306-307, 309, 312-315, 319-320, 324-329, 332
- Chapter 4 - pp. 353-354, 358-359, 363-367, 370-371, 374-377, 380-381, 385-387, 390-391, 396-399, 402-403, 410-415, 418-419, 425-429, 433-435, 439-442, 446-447, 450-453, 456-457, 460-464
- Chapter 5 - pp. 486-487, 490-491, 498-502, 505-507, 510-514, 517, 521-523, 526-527, 533-534, 537, 541-543, 546, 551-552, 555-557, 561-562, 565-566, 570-571, 574-575, 579-580, 583
- Chapter 6 - pp. 600-601, 604-605, 609-610, 612-613, 617-618, 621-622, 625-626, 629-630, 633-638, 641-643, 646-654, 658-661, 666-672, 676-677, 680-682, 686-689, 693-695, 698-699
- Chapter 7 - pp. 717-720, 724-725, 727-729, 732, 736-739, 742-743, 748-751, 754-755, 758-762, 764, 768-771, 775-776
- Chapter 8 - pp. 795-800, 805-807, 810-812, 815-816, 820-823, 825-826, 831-834, 837, 846-849, 851-852, 858, 860-861, 866-867, 871-872, 877-878, 881-882, 887, 890-891
- Chapter 9 - pp. 908, 911, 915-916, 919-921, 924-927, 930-931, 935-937, 941-942, 945-948, 952, 959-961, 964, 968, 970-971, 975-976, 979, 980, 983-985, 987

The sections "What Do You Think Now?," "Physics Essential Questions," and "Reflecting on the Section" and the "Challenge" provide an opportunity for students to write over an extended period of time as they revisit their earlier thinking, rewrite previous statements, discuss their investigations, summarize the important concepts or create a revised explanation for the natural phenomenon they have observed within that *Section*.

- Chapter 1 - pp. 16-17, 19-20, 30-32, 48-51, 66-71, 86-89, 101-104, 112-115
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