



TEXAS Standards Correlations



Component Codes

CA: Chapter Assessment	ML: Minilab
CI: Chapter Investigation	PT: Performance Task
CR: Chapter Review	RP: Revisit the Phenomenon
CS: Case Study	SR: Section Review
Explorer: Explorer feature	TIAT: Tying It All Together
LAD: Looking At the Data	U: Unit
Math/LA: Math and Language Arts Connections	UO: Unit Opener

Bold blue numbers indicate chapters or sections.

Texas Essential Knowledge and Skills (TEKS)TX2
 English Language Proficiency Standards (ELPS).....TX21

Texas Essential Knowledge and Skills

BIOLOGY		
STANDARD	STUDENT/TEACHER EDITION	ONLINE RESOURCES
(b) Introduction.		
<p>(1) Biology. Students in Biology focus on patterns, processes, and relationships of living organisms through four main concepts: biological structures, functions, and processes; mechanisms of genetics; biological evolution; and interdependence within environmental systems. By the end of Grade 12, students are expected to gain sufficient knowledge of the scientific and engineering practices across the disciplines of science to make informed decisions using critical thinking and scientific problem solving.</p>		
	1.1 p. 4, pp. 6–7; 1.1 SR p. 7 #1, #2; 1.2 pp. 11–12; 1.3 pp. 18–21; 14 ML p. 444	CI 11A; CI 14B; CI 16B
<p>(2) Nature of science. Science, as defined by the National Academy of Sciences, is the “use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process.” This vast body of changing and increasing knowledge is described by physical, mathematical, and conceptual models. Students should know that some questions are outside the realm of science because they deal with phenomena that are not currently scientifically testable.</p>		
	1.2 pp. 9–15; 1 CR p. 35 #9, #10; 2 CR p. 67 #13; 6 CR p. 187 #14	CI 8A; CI 14B
(3) Scientific hypotheses and theories. Students are expected to know that:		
<p>(A) hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power that have been tested over a wide variety of conditions are incorporated into theories; and</p>	1.1 SR p. 7 #4; 1.2 p. 14; 1 CR p. 35 #10; 11.1 p. 333; 11.1 SR p. 333 #4	CI 2A; CI 2B; CI 3B; CI 7A; CI 8B

STANDARD	STUDENT/TEACHER EDITION	ONLINE RESOURCES
<p>(B) scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well established and highly reliable explanations, but they may be subject to change as new areas of science and new technologies are developed.</p>	<p>1.1 SR p. 7 #4; 1.2 p. 14; 2 CR p. 67 #13; 11.1 SR p. 333 #4; 15.1 pp. 468–475</p>	<p>CI 14A; CI 14B</p>
<p>(4) Scientific inquiry. Scientific inquiry is the planned and deliberate investigation of the natural world using scientific and engineering practices. Scientific methods of investigation are descriptive, comparative, or experimental. The method chosen should be appropriate to the question being asked. Student learning for different types of investigations include descriptive investigations, which involve collecting data and recording observations without making comparisons; comparative investigations, which involve collecting data with variables that are manipulated to compare results; and experimental investigations, which involve processes similar to comparative investigations but in which a control is identified.</p>		
<p>(A) Scientific practices. Students should be able to ask questions, plan and conduct investigations to answer questions, and explain phenomena using appropriate tools and models.</p>	<p>1.2 pp. 9–10, p. 12; 1.3 p. 18; 15.1 pp. 469–470</p>	<p>CI 1A</p>
<p>(B) Engineering practices. Students should be able to identify problems and design solutions using appropriate tools and models.</p>	<p>1.3 pp. 20–21; 13 CS p. 391; 13 TIAT p. 427 #1</p>	<p>CI 1B; CI 16B; U5 PT5</p>
<p>(5) Science and social ethics. Scientific decision making is a way of answering questions about the natural world involving its own set of ethical standards about how the process of science should be carried out. Students should be able to distinguish between scientific decision-making methods (scientific methods) and ethical and social decisions that involve science (the application of scientific information).</p>		
	<p>1.2 p. 15; 7 CS p. 189; 7 Explorer p. 206; 7 TIAT p. 207 #2; 7 CR p. 209 #4; 10 LAD p. 303; 13 CS p. 391; 13.2 p. 402; 13 TIAT p. 427; 13 CR p. 429 Math/LA #2; 16.4 p. 525</p>	<p>CI 1A</p>
<p>(6) Science consists of recurring themes and making connections between overarching concepts. Recurring themes include systems, models, and patterns. All systems have basic properties that can be described in space, time, energy, and matter. Change and constancy occur in systems as patterns and can be observed, measured, and modeled. These patterns help to make predictions that can be scientifically tested, while models allow for boundary specification and provide a tool for understanding the ideas presented. Students should analyze a system in terms of its components and how these components relate to each other, to the whole, and to the external environment.</p>		
	<p>1.2 pp. 10–13; 1.2 SR p. 15 #2; U1 Activity p. 155; 14 ML p. 444</p>	<p>CI 11A; CI 14B; CI 16B</p>

STANDARD	STUDENT/TEACHER EDITION	ONLINE RESOURCES
(c) Knowledge and skills.		
(1) Scientific and engineering practices. The student, for at least 40% of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. The student is expected to:		
(A) ask questions and define problems based on observations or information from text, phenomena, models, or investigations;		
(i) ask questions based on observations or information from text, phenomena, models, or investigations	1.2 p. 9, p. 12; 1 TIAT p. 33 #1, #2; 1 CR p. 35 #12; 2 CR p. 67 RP #2; 3.1 SR p. 72 #1; 3 Explorer p. 73; 3 TIAT p. 87 #1; 3 CR p. 89 #10, RP #2; 4 CR p. 113 #18; U2 Explorer p. 118; 5.2 p. 129; 5 TIAT p. 153 #1; 5 CR p. 155 RP #2; 7 Explorer p. 206; 7 CR p. 209 RP #2; 8.1 p. 218; 8.1 SR p. 225 #1, #2, #4; 8.3 pp. 235–236; 8.3 SR p. 241 #3; 8 Explorer p. 252; 8 CR pp. 254–255 #3, #12, RP #2; 9 CR p. 287 RP #2; 10.4 p. 304; 10 CR p. 317 #13, Math/LA #1–4, RP #2; 11 Explorer p. 334; 11 TIAT p. 353 #1; 11 CR p. 355 RP #2; 14.1 p. 438; 14 Explorer p. 462; 14 CR p. 465 RP #2; 15 TIAT p. 491 #1; 16 CR p. 529 RP #2	1 CA #14; CI 1A; CI 2A; 8 CA #15; CI 10A; U3 PT1 #3; CI 11A; U4 PT1 #2; CI 15B; CI 16A; U5 PT1 #2
(ii) define problems based on observations or information from text, phenomena, models, or investigations	1.3 pp. 18–19; 3 CR p. 89 Math/LA #1; 4 Explorer p. 102; 4 LAD p. 110 #1–5; 14 Explorer p. 462	CI 1B; 4 CA #12; CI 4B; U1 PT5 #3; CI 6B; U2 PT3 #1; CI 10B; U4 PT1 #2; CI 16B; U5 PT1 #2; U5 PT2 #2, #4; U5 PT3 #2; U5 PT4 #2; U5 PT5 #1
(B) apply scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to design solutions to problems;		
(i) apply scientific practices to plan descriptive investigations	1.2 p. 10, p. 12; 1 CR p. 34 #1	CI 1A; CI 8B; 12 CA #17
(ii) apply scientific practices to plan comparative investigations	1.2 p. 10, p. 12; 1 CR p. 34 #1; 3 ML p. 86 #5; 8 CR p. 254 #1	CI 4A
(iii) apply scientific practices to plan experimental investigations	1.2 p. 10, p. 12; 1.4 p. 22; 1 TIAT p. 33 #3; 1 CR p. 34 #1; 10 CR p. 317 #11; 13 LAD p. 414; 13 CR p. 429 #14	CI 3B; CI 5B; CI 9B; CI 10A; U3 PT2 #3
(iv) apply scientific practices to conduct descriptive investigations	1.2 pp. 11–12; U1 Explorer p. 38; 3 ML p. 86 #1; 3 TIAT p. 87 #1; 4 Explorer p. 102; 8 ML p. 234; 8 TIAT p. 253 #1; 9 ML p. 264	CI 1A; CI 3A; CI 7A; CI 8A; CI 11A; CI 12B; CI 13A
(v) apply scientific practices to conduct comparative investigations	1.2 pp. 11–12; 1 LAD p. 30; 8 ML p. 234 #2, #3; 8 LAD p. 243 #3, #4; 10 ML p. 299	CI 4A; CI 6A; CI 11B
(vi) apply scientific practices to conduct experimental investigations	1.2 pp. 11–12; 1.4 p. 22; 4 LAD p. 110; 5 Explorer p. 144	CI 2A; CI 3B; CI 5A; CI 5B; CI 9B; CI 10A
(vii) use engineering practices to design solutions to problems	1.3 pp. 18–21; 1 TIAT p. 33 #4; 13 TIAT p. 427 #2	1 CA #10; CI 1B; CI 4B; U1 PT5 #3; CI 6B; CI 10B; 13 CA #15; CI 16B

STANDARD	STUDENT/TEACHER EDITION	ONLINE RESOURCES
(C) use appropriate safety equipment and practices during laboratory, classroom, and field investigations as outlined in Texas Education Agency-approved safety standards;		
(i) use appropriate safety equipment during laboratory investigations as outlined in Texas Education Agency-approved safety standards	1.2 p. 12; Student Lab Manual pp. 1–6	CI 4A; CI 5B; CI 6A; CI 6B; CI 7A; CI 8B; CI 9A; CI 9B; CI 11B
(ii) use appropriate safety equipment during classroom investigations as outlined in Texas Education Agency-approved safety standards	1.2 p. 12; Student Lab Manual pp. 1–6	CI 7A; CI 8B; CI 9A; CI 9B; CI 11B
(iii) use appropriate safety equipment during field investigations as outlined in Texas Education Agency-approved safety standards	1.2 p. 12; Student Lab Manual pp. 1–6	CI 3A; CI 10A
(iv) use appropriate safety practices during laboratory investigations as outlined in Texas Education Agency-approved safety standards	1.2 p. 12; Student Lab Manual pp. 1–3	CI 4A; CI 4B; CI 5A; CI 5B; CI 6A; CI 6B; CI 7A; CI 8B; CI 9A; CI 9B; CI 11B; CI 15B
(v) use appropriate safety practices during classroom investigations as outlined in Texas Education Agency-approved safety standards	1.2 p. 12; 1 ML p. 8; 3 ML p. 86; 6 ML p. 176; Student Lab Manual pp. 1–3	CI 7A; CI 8B; CI 9A; CI 9B; CI 11B
(vi) use appropriate safety practices during field investigations as outlined in Texas Education Agency-approved safety standards	1.2 p. 12; Student Lab Manual pp. 1–3	CI 3A; CI 10A
(D) use appropriate tools such as microscopes, slides, Petri dishes, laboratory glassware, metric rulers, digital balances, pipets, filter paper, micropipettes, gel electrophoresis and polymerase chain reaction (PCR) apparatuses, microcentrifuges, water baths, incubators, thermometers, hot plates, data collection probes, test tube holders, lab notebooks or journals, hand lenses, and models, diagrams, or samples of biological specimens or structures;		
(i) use appropriate tools	1.2 p. 12; 8 ML p. 234 #1–3; 8 CR p. 255 Math/LA #2; Student Lab Manual pp. 4–6	CI 1A; CI 4A; CI 4B; CI 5A; CI 5B; CI 6A; CI 6B; CI 13A; CI 13B; CI 15B; CI 16B
(E) collect quantitative data using the International System of Units (SI) and qualitative data as evidence;		
(i) collect quantitative data using SI	1.2 p. 12; 1.4 p. 23; 1 LAD p. 30	CI 2A; CI 4A; CI 6A; 8 CA #18; 12 CA #7, #8
(ii) collect qualitative data as evidence	1 ML p. 8 #1; 1.2 p. 12; 1.4 pp. 23–24; 2 LAD p. 64; 2 TIAT p. 65 #1; 4 Explorer p. 102; 6 LAD p. 167 #1–3; 12 ML p. 386 #1, #2; 14.2 SR p. 452 #2	CI 1A; CI 4A; CI 5A; CI 7A; CI 8A; CI 8B; CI 11A; CI 11B; CI 13A; U4 PT4 #1; CI 15A; CI 15B; U5 PT5 #1
(F) organize quantitative and qualitative data using scatter plots, line graphs, bar graphs, charts, data tables, digital tools, diagrams, scientific drawings, and student-prepared models;		
(i) organize quantitative data using scatter plots	1.4 p. 27; 1.4 SR p. 29 #1; 8 LAD p. 243	
(ii) organize quantitative data using line graphs	1.4 pp. 25–27; 4.3 p. 104; 4 CR p. 113 Math/LA #3, #4; 6 CR p. 187 Math/LA #2	CI 2A; CI 2B; 4 CA #4; CI 4A; U1 PT4 #2; CI 6A; CI 10A
(iii) organize quantitative data using bar graphs	1.4 p. 28; 1 LAD p. 31 #2; 2 ML p. 56 #1; 3 LAD p. 79	CI 14A
(iv) organize quantitative data using charts	1.4 p. 29; 3.2 p. 74; 12 TIAT p. 387; 16 LAD p. 519	

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(v) organize quantitative data using data tables	1.4 pp. 23–24; 2 CR p. 67 Math/LA #2; 12.3 p. 374; 13 LAD p. 415 #2; 16 LAD p. 519 #1, #2; 16 ML p. 526 #1	CI 1A ; CI 2A ; CI 2B ; CI 3B ; CI 4A ; CI 6A ; CI 7A ; 8 CA #18; CI 12B ; CI 14A ; CI 14B
(vi) organize quantitative data using digital tools	1.4 p. 24; 4 Explorer p. 102	CI 3A ; CI 14A ; CI 16B
(vii) organize quantitative data using diagrams	1.4 p. 24; 2.3 pp. 52–54; 2 LAD p. 64 #4	CI 1A ; CI 10A ; CI 12B
(viii) organize quantitative data using scientific drawings	1.2 p. 12	CI 7B ; CI 8A
(ix) organize quantitative data using student-prepared models	1.2 p. 12	CI 1A ; 2 CA #14; CI 2A ; CI 8A
(x) organize qualitative data using charts	1.4 p. 24; 7 LAD p. 195	
(xi) organize qualitative data using data tables	1.4 p. 23; 7 LAD p. 195	CI 1A ; CI 5A ; CI 7A ; CI 12B ; CI 13B ; CI 14B ; CI 15B ; CI 16A
(xii) organize qualitative data using digital tools	1.4 p. 24; 4 Explorer p. 102	CI 8A ; 10 CA #1; CI 14A ; CI 14B ; CI 16A ; CI 16B
(xiii) organize qualitative data using diagrams	1.2 p. 12; 1.4 p. 24; 2.3 SR p. 54 #1; 5.3 SR p. 142 #4; 9.1 p. 262	CI 1A ; CI 7A ; CI 11A ; CI 12B ; CI 16A
(xiv) organize qualitative data using scientific drawings	1.2 p. 12; 3 ML p. 86 #4; 10.2 p. 296; 14 ML p. 444 #2	CI 7B ; CI 9A ; CI 13A ; CI 16A ; CI 16B
(xv) organize qualitative data using student-prepared models	1.2 p. 12	CI 1A ; CI 3B ; CI 7A ; U3 PT1 #2, #4; U3 PT2 #2
(G) develop and use models to represent phenomena, systems, processes, or solutions to engineering problems;		
(i) develop models to represent phenomena, systems, processes, or solutions to engineering problems	1 CR pp. 34–35 #3, #11; 2.1 pp. 42–43; 2 ML p. 56; 2.4 p. 59; 2 TIAT p. 65 #2; 4 CR p. 113 #13, Math/LA #4; U1 Activity p. 115; 5.1 SR p. 128 #4; 5.3 SR p. 142 #2, #4; 6 ML p. 176 #3; 7.2 SR p. 199 #1; 7 CR p. 209 #12; U2 Activity p. 211; 8 TIAT p. 253 #2; 9.1 p. 262; 9 TIAT p. 285 #2; 10.2 SR p. 298 #1; 10 ML p. 299 #1; 10 TIAT p. 315 #2, #3; 10 CR p. 317 Math/LA #3; U3 Activity p. 319; 11 TIAT p. 353 #2; 12 TIAT p. 387 #2; 13 TIAT p. 427 #3; 14 ML p. 444 #2, #3; 16 TIAT p. 527 #1; U5 Activity p. 531	2 CA #13, #14; CI 2A ; CI 4B ; U1 PT1 #3; U1 PT2 #3; U1 PT4 #1; 5 CA #7; CI 6B ; 7 CA #5, #7; CI 7A ; CI 7B ; U2 PT3 #1–4; 8 CA #1; CI 9A ; CI 10A ; CI 10B ; U3 PT1 #2, #4; U4 PT1 #3, #4; CI 15A ; CI 16A ; U5 PT1 #4; U5 PT3 #4; U5 PT4 #5; U5 PT5 #2
(ii) use models to represent phenomena, systems, processes, or solutions to engineering problems	1.2 p. 14; 2.2 pp. 47–48; 2.3 pp. 52–54; 2.3 SR p. 54 #5; 2.4 pp. 58–61; 2.4 SR p. 63 #3; 2 LAD p. 64 #2; 4 ML p. 96 #1–5; 4.3 p. 104; 5.1 p. 126; 5.2 SR p. 132 #1, #4; 5.3 SR p. 142 #1; 5 CR pp. 154–155 #1, #2, #4, #7, #10, Math/LA #3; 6.2 p. 174; 6.3 pp. 178–179, p. 182; 6.3 SR p. 183 #4; 7.1 SR p. 194 #1; 7.2 p. 197, p. 199; 7.2 SR p. 199 #3; 7.3 p. 203; 7.3 SR p. 204 #1; 7 CR pp. 208–209 #1, #2, #6, Math/LA #1, #4; 8.1 p. 218; 8.2 p. 226; 8.2 SR p. 233 #2, #4; 8 TIAT p. 253 #3; 9 LAD p. 284 #2, #3, #6, #7; 9 TIAT p. 285 #2; 10 ML p. 299 #2, #3; 10.3 p. 300; 11 ML p. 344 #1, #2, #4; 11 TIAT p. 353 #3; 12.4 p. 384; 12 TIAT p. 387 #2; 13.3 p. 416; 15 ML p. 476 #1; 15 LAD p. 485 #3; 15 CR p. 492 #2, #3, #6, #7	2 CA #12; CI 2A ; 4 CA #1, #4, #8, #9; CI 4B ; U1 PT1 #3; U1 PT2 #3, #4; U1 PT4 #3; 6 CA #13, #15, #16; CI 6B ; 7 CA #1, #6, #9, #12, #16; U2 PT2 #1; 8 CA #6, #8; 9 CA #13; CI 9A ; CI 10B ; 11 CA #15; 12 CA #9, #18; 15 CA #7, #8, #14; U5 PT5 #3

STANDARD	STUDENT/TEACHER EDITION	ONLINE RESOURCES
(H) distinguish among scientific hypotheses, theories, and laws.		
(i) distinguish among scientific hypotheses, theories, and laws	1.2 p. 14; 5 CR p. 154 #4	
(2) Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. The student is expected to:		
(A) identify advantages and limitations of models such as their size, scale, properties, and materials;		
(i) identify advantages of models such as their size, scale, properties, and materials	1.2 pp. 12–13; 1.3 p. 21; 2 Explorer p. 50; 4.1 p. 92, p. 95; 4 CR p. 112 #7; 7 ML p. 200 #1; 11 ML p. 344 #3	CI 2A ; U1 PT5 #1, #2; CI 10B ; CI 16B
(ii) identify limitations of models such as their size, scale, properties, and materials	1.2 pp. 12–13; 1.3 p. 21; 4.1 p. 92, p. 95; 4 ML p. 96 #5; 4 CR p. 113 #14; 7 ML p. 200 #1; 11 ML p. 344 #3; 15 CR p. 493 #11	4 CA #2, #10; U1 PT5 #1, #2; CI 8A ; CI 10B ; CI 16A ; CI 16B
(B) analyze data by identifying significant statistical features, patterns, sources of error, and limitations;		
(i) analyze data by identifying significant statistical features	1.2 pp. 12–13; 1 CR pp. 34–35 #3, Math/LA #3; 4.1 pp. 94–95; 4.2 p. 97; 12 CR p. 389 Math/LA #5; 14.2 p. 449; 14 LAD p. 453 #1, #2; 16.3 p. 511	U1 PT1 #1; U1 PT3 #1; CI 8A ; CI 12B
(ii) analyze data by identifying patterns	1.2 pp. 11–13; 1 LAD p. 31 #3, #4; 1 CR p. 35 Math/LA #3; 2.2 SR p. 49 #3; 2 ML p. 56 #2; 2 LAD p. 64 #5, #6; 3.2 p. 74; 3.2 SR p. 78 #3; 3 LAD p. 79 #1, #2, #4, #5; 3.3 p. 82; 3 CR p. 89 #12, Math/LA #2; 4.1 pp. 94–95; 4.2 p. 97, pp. 100–101; 4.3 p. 103; 4 LAD p. 110 #1; 4 CR pp. 112–113 #2, #6, #8–10, Math/LA #3, #6; 5 ML p. 133 #1; 5 LAD p. 152 #1–4; 7 LAD p. 195 #1, #2; 8 LAD p. 243 #1–5; 8 CR pp. 254–255 #2, Math/LA #2; 9 LAD p. 284 #2; 9 CR p. 287 Math/LA #1; 10.1 p. 292; 10.1 SR p. 293 #1; 10 ML p. 299 #2, #3; 10 LAD p. 303 #3, #4; 10 TIAT p. 315 #1, #2; 10 Explorer p. 314; 11 LAD p. 352 #2, #4; 11 CR p. 355 Math/LA #3; 12.3 pp. 374–375; 12 LAD p. 380 #1, #2; 12.4 p. 384; 12 ML p. 386 #3; 12 CR p. 389 Math/LA #5; 13 LAD p. 415 #1, #4; 13 CR pp. 428–429 #2, Math/LA #4; 14.2 p. 449; 14 LAD p. 453 #1, #2; 14.3 p. 460; 15 ML p. 476 #3; 15.2 SR p. 482 #3; 15 LAD p. 485 #4; 16.2 SR p. 508 #1; 16.3 p. 511; 16 ML p. 526 #2–5	3 CA #7, #8, #15; CI 4A ; U1 PT1 #1; U1 PT2 #2; U1 PT3 #1; U1 PT4 #2; U1 PT5 #1; CI 5A ; 7 CA #4, #14; CI 7A ; CI 9B ; CI 11B ; 12 CA #9, #20; CI 12B ; 13 CA #12; CI 13A ; U4 PT1 #1; U4 PT3 #1, #2; 14 CA #1; CI 14A ; CI 14B ; CI 15B ; 16 CA #20; U5 PT1 #1, #3; U5 PT2 #1, #3; U5 PT3 #1, #3; U5 PT4 #1, #3
(iii) analyze data by identifying sources of error	1.2 p. 12; 1.4 p. 28	CI 8B ; U4 PT4 #2
(iv) analyze data by identifying limitations	1.2 p. 14; 1.3 p. 19; 1.4 p. 28; 12 ML p. 386 #3	U5 PT4 #1, #3
(C) use mathematical calculations to assess quantitative relationships in data; and		
(i) use mathematical calculations to assess quantitative relationships in data	1.2 p. 12; 2.3 pp. 52–54; 3 LAD p. 79 #3; 4.1 p. 93; 4.1 SR p. 95 #1, #3; 4 ML p. 96 #1–4; 4.2 p. 97; 4.2 SR p. 101 #3, #4; 4.3 SR p. 107 #2, #3; 4 LAD p. 110 #1, #4, #5; 4 CR pp. 112–113 #1, #2, #9, Math/LA #2, #6; 5.1 p. 124; 5.4 SR p. 151 #1; 5 CR p. 155 Math/LA #1; 7.1 SR p. 194 #1; 7 CR p. 209 Math/LA #1; 9 LAD p. 284 #1, #2, #4, #5; 11 LAD p. 352 #1; 11 CR p. 355 Math/LA #2; 12.3 p. 379; 13 ML p. 426 #1; 13 CR p. 429 Math/LA #1; 15.2 p. 478; 15 LAD pp. 484–485; 15 CR p. 493 Math/LA #4	CI 2A ; CI 2B ; CI 3A ; CI 4A ; 5 CA #5; CI 7A ; CI 12A ; CI 12B ; 13 CA #11; CI 14A ; 15 CA #6; CI 15A

STANDARD	STUDENT/TEACHER EDITION	ONLINE RESOURCES
(D) evaluate experimental and engineering designs.		
(i) evaluate experimental designs	1 ML p. 8 #3; 1.2 pp. 9–12; 1.3 p. 21; 1.3 SR p. 21 #1, #3; 1 Explorer p. 32; 1 CR p. 34 #1, #4, #5; 9 Explorer p. 278; 9 CR p. 287 #16; 10 CR p. 317 #11	1 CA #5, #7, #8, #14; CI 8B; U4 PT4 #2
(ii) evaluate engineering designs	1.3 pp. 18–21; 1.3 SR p. 21 #2, #3; 1 CR pp. 34–35 #4, #7, #8, #11, Math/LA #2, #4; 4 CR p. 113 #19; 13.2 SR p. 412 #3; 13.3 SR p. 425 #1; 13 TIAT p. 427 #3	1 CA #5, #10, #14; CI 1B; CI 4B; CI 6B; CI 10B; CI 13B; U4 PT4 #2; CI 16B
(3) Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to:		
(A) develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories;		
(i) develop explanations supported by data and consistent with scientific ideas	1.2 p. 9, pp. 11–12; 1 TIAT p. 33; 2 Explorer p. 50; 2 TIAT p. 65; 3 TIAT p. 87 #1; 10 CS p. 289; 10.1 p. 290, p. 292; 10.1 SR p. 293 #2–4; 10.2 p. 294; 10 LAD p. 303 #1–4; 10.4 p. 304, p. 312; 10.4 SR p. 312 #1, #2; 10 Explorer p. 314; 10 CR p. 316 #1, #2, #7; 11 TIAT p. 353; 12 LAD p. 380 #3; 14.1 p. 440; 14 ML p. 444 #1; 14 LAD p. 453 #3, #4; 16 TIAT p. 527 #4; 16 CR p. 528 #8	CI 1A; 2 CA #14; U1 PT3 #3; CI 7A; CI 8A; CI 9B; 10 CA #2, #3, #8, #9; CI 11B; 12 CA #14, #21; U4 PT2 #1, #2; U4 PT4 #3, #4; 14 CA #15; CI 15A; CI 15B; U5 PT2 #3; U5 PT3 #3; U5 PT4 #1
(ii) develop explanations supported by data and consistent with scientific principles	1.2 p. 12; 1 CR p. 34 #8; 2.2 p. 47, p. 49; 2 Explorer p. 50; 3.2 SR p. 78 #1; 3 ML p. 86 #4; 3 TIAT p. 87; 3 CR pp. 88–89 #9, Math/LA #1, #3; 6 TIAT p. 185 #3; 8.1 pp. 224–225; 8.2 p. 231; 8.2 SR p. 233 #1, #2; 8.3 p. 236, p. 238; 8.3 SR p. 241 #1; 8.4 p. 250; 8 CR p. 254 #3, #9; 10 CS p. 289; 10 TIAT p. 315 #2; 10 CR p. 316 #4, #6; 11 TIAT p. 353; 12.1 p. 358; 12 LAD p. 380 #3; 12 TIAT p. 387 #1; 13.3 p. 422; 13 ML p. 426 #2	1 CA #13; 3 CA #17; U1 PT2 #4; 8 CA #14, #17; 10 CA #7; CI 11B; U4 PT4 #3, #4; CI 15A; U5 PT4 #1
(iii) develop explanations supported by data and consistent with scientific theories	1.1 pp. 6–7; 1.2 p. 12; 1 CR p. 34 #2; 7 LAD p. 195 #3, #4; 8.2 SR p. 233 #2; 15.1 p. 475; 15 ML p. 476 #2; 15 LAD p. 485 #6; 15 TIAT p. 491 #3; 16.4 p. 524	1 CA #11, #12; 8 CA #14; CI 11B; 15 CA #2, #3, #5; CI 15A; CI 15B
(iv) develop explanations supported by models and consistent with scientific ideas	1.2 pp. 11–13; 1 CR p. 35 #9, #11, Math/LA #1, #2, #4; 2.1 SR p. 45 #1; 2.2 p. 46, p. 49; 2 Explorer p. 50; 2.3 pp. 51–54; 2.3 SR p. 54 #3; 2 ML p. 56 #4; 2.4 pp. 57–58, p. 60, p. 62; 2 TIAT p. 65 #3; 2 CR pp. 66–67 #2, #5, Math/ LA #4; 3.1 SR p. 72 #1; 8 TIAT p. 253 #3; 10.1 SR p. 293 #3; 10.2 p. 296; 10.2 SR p. 298 #2; 10.3 p. 300; 10.4 p. 305, p. 311; 10.4 SR p. 312 #3, #4; 10 TIAT p. 315 #4; 10 CR p. 316 #3, #9; 11 TIAT p. 353	1 CA #9; 2 CA #1, #2, #5, #7, #9, #11, #12; 10 CA #10; CI 12A; CI 15A; CI 16A
(v) develop explanations supported by models and consistent with scientific principles	1.2 p. 12; 2.2 p. 49; 2 Explorer p. 50; 2.3 pp. 51–53; 2.4 p. 57; 2 CR p. 67 #12; 3.1 SR p. 72 #1; 10.3 p. 302; 10.4 p. 308; 11 TIAT p. 353; 13.2 p. 407; 13 ML p. 426 #4; 13 CR p. 429 #10–12, Math/LA #3; U5 UO p. 432; 15.1 p. 471	U1 PT2 #4; CI 12A; 13 CA #13; CI 15A; CI 16A

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(vi) develop explanations supported by models and consistent with scientific theories	1.2 p. 12; 2.2 p. 49; 2 Explorer p. 50; 2.3 pp. 51–53; 2.4 p. 57; 5.1 p. 128; 5.1 SR p. 128 #1–3; 5.2 p. 130; 5.2 SR p. 132 #2, #3; 5 ML p. 133 #2, #4; 5.3 pp. 134–135, p. 137, pp. 139–141; 5.3 SR p. 142 #3; 5 Explorer p. 144; 5.4 pp. 145–147, p. 149; 5.4 SR p. 151 #2–4; 5 CR pp. 154–155 #3, #5, #6, #8, #9, #11–15, Math/LA #4, RP #1; 7.2 SR p. 199 #2; 7 ML p. 200 #2–4; 7 Explorer p. 206; 7 CR pp. 208–209 #7, #10, #11; 10.4 p. 312; 11 TIAT p. 353; U5 UO p. 432; 15.1 pp. 471–473; 15.1 SR p. 475 #3; 15.2 SR p. 482 #1; 15.3 p. 487; 15.3 SR p. 489 #2, #4; 15 CR pp. 492–493 #8, #10, #12, #13, Math/LA #3	5 CA #1–3, #6, #9–15; 7 CA #15, #17, #18; CI 12A; 15 CA #11, #12, #13; CI 15A
(vii) propose solutions supported by data and consistent with scientific ideas	1.2 pp. 11–12; 2 Explorer p. 50; 3 TIAT p. 87; 4 CR p. 113; 8 CS p. 217; 10 Explorer p. 314; 16 LAD p. 519 #3, #4; 16 CR p. 529 Math/LA #3	CI 6B; CI 13B; CI 15B
(viii) propose solutions supported by data and consistent with scientific principles	1.2 p. 12; 2 Explorer p. 50; 8 CS p. 217; 16 CR p. 529 Math/LA #3;	U1 PT5 #3; 13 CA #1; U4 PT2 #3
(ix) propose solutions supported by data and consistent with scientific theories	1.2 p. 12; 1.3 p. 20	U4 PT2 #3; U4 PT4 #3E
(x) propose solutions supported by models and consistent with scientific ideas	1.2 pp. 11–12; 1.3 p. 20; 2 Explorer p. 50	CI 6B
(xi) propose solutions supported by models and consistent with scientific principles	1.2 p. 12; 1.3 p. 20; 2 Explorer p. 50; 13.1 p. 399; 13.3 p. 425	CI 6B
(xii) propose solutions supported by models and consistent with scientific theories	1.2 p. 12; 1.3 p. 20	CI 16B; U5 PT4 #4
(B) communicate explanations and solutions individually and collaboratively in a variety of settings and formats; and		
(i) communicate explanations individually in a variety of settings	1.1 p. 4, pp. 6–7; 1.1 SR p. 7 #1, #4; 1.2 p. 9, pp. 11–12, pp. 14–15; 1.3 p. 18, p. 21; 1 CR p. 35 Math/LA #4; 5 TIAT p. 153 #2; 5 CR p. 155 Math/LA #2; 7 TIAT p. 207 #3; 10 CR p. 317 RP #1; 14 TIAT p. 463 #3; 15.3 p. 488; 15 CR p. 493 Math/LA #1, #2	U1 PT1 #4; U1 PT2 #4; U1 PT3 #4; 7 CA #13; U2 PT1 #4; U2 PT2 #4; U4 PT1 #4; U4 PT3 #3; U4 PT2 #4; U4 PT4 #4; U5 PT3 #4; U5 PT4 #5
(ii) communicate explanations individually in a variety of formats	1.2 p. 12, pp. 14–15; 1 LAD p. 31 #5; 1 Explorer p. 32; 1 CR p. 35 #9, #12; 2.1 SR p. 45 #1, #4; 2.2 SR p. 49 #1–3; 2.3 SR p. 54 #2; 2.4 SR p. 63 #1–3; 2 LAD p. 64 #3, #6, #8; 2 CR pp. 66–67 #1, #2, #4, #6, #8–11, Math/LA #3, #4; 3 ML p. 86 #1; 8 TIAT p. 253 #3; 10.1 SR p. 293 #4; 10 TIAT p. 315 #4; 10 LAD p. 303 #3, #4; 10 CR p. 317 Math/LA #1; 14 TIAT p. 463 #3; 14 CR p. 465 Math/LA #4	10 CA #10–13; U4 PT1 #4; U4 PT2 #4; U4 PT3 #3; U4 PT4 #4; CI 14A; CI 14B; U5 PT3 #4; U5 PT4 #5
(iii) communicate explanations collaboratively in a variety of settings	1.2 p. 12, pp. 14–15; 2 Explorer p. 50; 3 ML p. 86 #2, #3; 12 Explorer p. 367; 13.3 p. 425; 14 TIAT p. 463 #3	CI 1A; CI 11A; CI 16A
(iv) communicate explanations collaboratively in a variety of formats	1.2 p. 12, pp. 14–15; 2 Explorer p. 50; 3 ML p. 86 #2, #3; 12 Explorer p. 367; 13.3 p. 425; 14 TIAT p. 463 #3	CI 14A; CI 14B; CI 16A
(v) communicate solutions individually in a variety of settings	1.2 p. 12, pp. 14–15; 8 Explorer p. 252	CI 1A
(vi) communicate solutions individually in a variety of formats	1.2 p. 12, pp. 14–15; 8 Explorer p. 252	U1 PT1 #4; U1 PT5 #3E

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(vii) communicate solutions collaboratively in a variety of settings	1.2 p. 12, pp. 14–15; U3 Explorer p. 214; 10 Explorer p. 314; 13.3 p. 425	CI 1B
(viii) communicate solutions collaboratively in a variety of formats	1.2 p. 12, pp. 14–15; U3 Explorer p. 214; 10 Explorer p. 314; 13.3 p. 425	CI 1B
(C) engage respectfully in scientific argumentation using applied scientific explanations and empirical evidence.		
(i) engage respectfully in scientific argumentation using applied scientific explanations	1.2 p. 10, p. 12, p. 15; 3 TIAT p. 87 #3; 3 CR p. 89 #12; 4 TIAT p. 111 #3; 4 CR p. 113 Math/LA #1, #5, RP #1; 8 LAD p. 243 #5; 8 CR pp. 254–255 #9, #13, #14, Math/LA #1; 9 ML p. 264 #2; 9 LAD p. 284 #3; 9 CR p. 287 Math/LA #4; 12 TIAT p. 387 #3; 12 CR p. 389 Math/LA #4; 14 CR p. 465 Math/LA #3; 15.2 SR p. 482 #2	3 CA #16; 4 CA #3, #10–12; 8 CA #13, #16; CI 10A; 12 CA #15; U3 PT1 #4; U3 PT3 #2; U3 PT3 #3; U4 PT3 #3; CI 16A
(ii) engage respectfully in scientific argumentation using empirical evidence	1.2 pp. 10–12, p. 15; 3 TIAT p. 87 #3; 4 TIAT p. 111 #3; 4 CR p. 113 Math/LA #1, #5, RP #1; 5 TIAT p. 153 #3; 8 LAD p. 243 #5; 8 CR pp. 254–255 #9, Math/LA #2; 9 ML p. 264 #2; 9 LAD p. 284 #3; 9 CR p. 287 Math/LA #4; 14.1 p. 439	4 CA #3, #10–12; U1 PT1 #4; CI 10A; U3 PT1 #4; U3 PT3 #2, #3; CI 13A; U4 PT3 #3; CI 14A; CI 14B; CI 15A; CI 15B; CI 16A
(4) Scientific and engineering practices. The student knows the contributions of scientists and recognizes the importance of scientific research and innovation on society. The student is expected to:		
(A) analyze, evaluate, and critique scientific explanations and solutions by using empirical evidence, logical reasoning, and experimental and observational testing, so as to encourage critical thinking by the student;		
(i) analyze scientific explanations and solutions by using empirical evidence so as to encourage critical thinking by the student	1.2 p. 12; 1 LAD p. 30; 1 TIAT p. 33; 2 LAD p. 64; 2 TIAT p. 65	CI 7A; CI 7B; CI 11B; CI 12B
(ii) analyze scientific explanations and solutions by using logical reasoning so as to encourage critical thinking by the student	1 ML p. 8; 3 ML p. 86; 9 CR p. 287 Math/LA #2; 13.1 p. 394; 13.1 SR p. 399 #3, #4; 13 Explorer p. 413; 13.3 p. 420; 13.3 SR p. 425 #3; 13 CR pp. 428–429 #5–7, #9, #14	13 CA #6, #10
(iii) analyze scientific explanations and solutions by using experimental testing, so as to encourage critical thinking by the student	5 ML p. 133; 6 ML p. 176	CI 15B
(iv) analyze scientific explanations and solutions by using observational testing, so as to encourage critical thinking by the student	1 ML p. 8; 3 ML p. 86	
(v) evaluate scientific explanations and solutions by using empirical evidence so as to encourage critical thinking by the student	4 TIAT p. 111; 6 TIAT p. 185; 9 TIAT p. 285; 13 TIAT p. 427; 15 LAD p. 485 #5; 16 TIAT p. 527; 16 CR p. 529 Math/LA #1, #2	CI 6B; CI 8A; CI 9B; CI 11B; CI 15A
(vi) evaluate scientific explanations and solutions by using logical reasoning so as to encourage critical thinking by the student	4 TIAT p. 111; 4 CR p. 112 #11; 6 TIAT p. 185; 9 TIAT p. 285; 13.1 p. 393; 13.2 p. 409; 13 TIAT p. 427; 13 CR p. 429 RP #1; 16 Explorer p. 509; 16 TIAT p. 527	13 CA #8
(vii) evaluate scientific explanations and solutions by using experimental testing, so as to encourage critical thinking by the student	1 ML p. 8 #3; 3 ML p. 86; 4 TIAT p. 111; 6 TIAT p. 185; 10 ML p. 299 #3	

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(viii) evaluate scientific explanations and solutions by using observational testing, so as to encourage critical thinking by the student	4 TIAT p. 111; 6 TIAT p. 185; 9 TIAT p. 285; 13 TIAT p. 427; 16 TIAT p. 527	CI 2A ; CI 6B
(ix) critique scientific explanations and solutions by using empirical evidence so as to encourage critical thinking by the student	4 TIAT p. 111; 6 TIAT p. 185; 9 TIAT p. 285; 11.1 p. 333; 11 CR p. 355 #15; 13 TIAT p. 427; 16 TIAT p. 527	CI 6B
(x) critique scientific explanations and solutions by using logical reasoning so as to encourage critical thinking by the student	4 TIAT p. 111; 6 TIAT p. 185; 9 TIAT p. 285; 13.2 p. 412; 13 TIAT p. 427; 15.1 p. 471; 16 TIAT p. 527	CI 1B ; U5 PT4 #3
(xi) critique scientific explanations and solutions by using experimental testing, so as to encourage critical thinking by the student	4 TIAT p. 111; 6 TIAT p. 185; 9 TIAT p. 285; 13 TIAT p. 427; 16 TIAT p. 527	CI 8A ; CI 10A
(xii) critique scientific explanations and solutions by using observational testing, so as to encourage critical thinking by the student	3 ML p. 86 #2; 4 TIAT p. 111; 6 TIAT p. 185; 9 TIAT p. 285; 13 TIAT p. 427; 16 TIAT p. 527	CI 13A ; CI 15A
(B) relate the impact of past and current research on scientific thought and society, including research methodology, cost-benefit analysis, and contributions of diverse scientists as related to the content; and		
(i) relate the impact of past research on scientific thought, including research methodology	1 CR p. 35 #10; 8.1 p. 218; 8.2 p. 226; 8 CR p. 255 #11, Math/LA #3; 12.3 pp. 374–375; 13.3 p. 418; 15.1 p. 475	8 CA #1, #8
(ii) relate the impact of past research on scientific thought, including cost-benefit analysis	1.3 p. 21; 1 Explorer p. 32	
(iii) relate the impact of past research on scientific thought, including contributions of diverse scientists as related to the content	6 CR p. 187 #14, Math/LA #4; 8 CR p. 255 Math/LA #3; 11.1 p. 328; 12 CR p. 389 #11, Math/LA #3; 15.1 pp. 468–469	
(iv) relate the impact of past research on society, including research methodology	4 CR p. 113 #19; 11.1 p. 328; 13.3 p. 418	U4 PT4 #1G
(v) relate the impact of past research on society, including cost-benefit analysis	1.3 p. 21; 13.2 p. 403	13 CA #5
(vi) relate the impact of past research on society, including contributions of diverse scientists as related to the content	1 Explorer p. 32; 2 Explorer p. 50; 4 Explorer p. 102; U4 Explorer p. 322; 11 Explorer p. 334	
(vii) relate the impact of current research on scientific thought, including research methodology	1 Explorer p. 32; U1 Explorer p. 38; 2 Explorer p. 50; 3 Explorer p. 73; 4 Explorer p. 102; U2 Explorer p. 118; 5 Explorer p. 144; 6 Explorer p. 184; 7 Explorer p. 206; U3 Explorer p. 214; 8.1 p. 218; 8.2 p. 226; 8 Explorer p. 252; 8 CR p. 255 #11; 9 Explorer p. 278; 10 Explorer p. 314; U4 Explorer p. 322; 11 Explorer p. 334; 12 Explorer p. 367; 13 Explorer p. 413; U5 Explorer p. 434; 14 Explorer p. 462; 15 Explorer p. 490; 16 Explorer p. 509	8 CA #8
(viii) relate the impact of current research on scientific thought, including cost-benefit analysis	1 Explorer p. 32	

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(ix) relate the impact of current research on scientific thought, including contributions of diverse scientists as related to the content	1 Explorer p. 32; U1 Explorer p. 38; 2 Explorer p. 50; 3 Explorer p. 73; 4 Explorer p. 102; U2 Explorer p. 118; 5 Explorer p. 144; 6 Explorer p. 184; 7 Explorer p. 206; U3 Explorer p. 214; 8 Explorer p. 252; 9 Explorer p. 278; 10 Explorer p. 314; U4 Explorer p. 322; 11.1 p. 328; 11 Explorer p. 334; 12 Explorer p. 367; 13 Explorer p. 413; U5 Explorer p. 434; 14 Explorer p. 462; 15.1 p. 468; 15 Explorer p. 490; 16 Explorer p. 509	
(x) relate the impact of current research on society, including research methodology	13 LAD p. 415 #5; 13.3 SR p. 425 #2	
(xi) relate the impact of current research on society, including cost-benefit analysis	7 TIAT p. 207 #2; 7 CR p. 209 #14; 13.2 pp. 402–403, p. 405; 13 LAD p. 415 #5; 13.3 p. 419; 13 CR p. 429 #13, Math/LA #2	13 CA #14
(xii) relate the impact of current research on society, including contributions of diverse scientists as related to the content	1 Explorer p. 32; U1 Explorer p. 38; 2 Explorer p. 50; 3 Explorer p. 73; 4 Explorer p. 102; U2 Explorer p. 118; 5 Explorer p. 144; 6 Explorer p. 184; 7 Explorer p. 206; U3 Explorer p. 214; 8 Explorer p. 252; 9 Explorer p. 278; 10 Explorer p. 314; U4 Explorer p. 322; 11.1 p. 328; 11 Explorer p. 334; 12 Explorer p. 367; 13 Explorer p. 413; U5 Explorer p. 434; 14 Explorer p. 462; 15.1 p. 468; 15 Explorer p. 490; 16 Explorer p. 509	
(C) research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field in order to investigate STEM careers.		
(i) research STEM careers	1 Explorer p. 32; 1 CR p. 35 Math/LA #3; U1 Explorer p. 38; 2 Explorer p. 50; 3 Explorer p. 73; 4 Explorer p. 102; U2 Explorer p. 118; 5 Explorer p. 144; 6 Explorer p. 184; 7 Explorer p. 206; U3 Explorer p. 214; 8 Explorer p. 252; 9 Explorer p. 278; 10 Explorer p. 314; U4 Explorer p. 322; 11 Explorer p. 334; 12 Explorer p. 367; 13 Explorer p. 413; U5 Explorer p. 434; 14 Explorer p. 462; 15 Explorer p. 490; 16 Explorer p. 509	
(ii) explore resources in order to investigate STEM careers	1 Explorer p. 32; 1 CR p. 35 Math/LA #3; U1 Explorer p. 38; 2 Explorer p. 50; 3 Explorer p. 73; 4 Explorer p. 102; U2 Explorer p. 118; 5 Explorer p. 144; 6 Explorer p. 184; 7 Explorer p. 206; U3 Explorer p. 214; 8 Explorer p. 252; 9 Explorer p. 278; 10 Explorer p. 314; U4 Explorer p. 322; 11 Explorer p. 334; 12 Explorer p. 367; 13 Explorer p. 413; U5 Explorer p. 434; 14 Explorer p. 462; 15 Explorer p. 490; 16 Explorer p. 509	
(5) Science concepts—biological structures, functions, and processes. The student knows that biological structures at multiple levels of organization perform specific functions and processes that affect life. The student is expected to:		
(A) relate the functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids, to the structure and function of a cell;		
(i) relate the functions of different types of biomolecules, including carbohydrates to the structure of a cell	5.3 p. 134, pp. 136–140; 5.3 SR p. 142 #1–3; 5.4 p. 146; 5 CR p. 154 #1–3; 6.3 pp. 177–179	5 CA #8; CI 5A; U2 PT3 #1–4

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(ii) relate the functions of different types of biomolecules, including lipids to the structure of a cell	5.3 pp. 138–139; 5.3 SR p. 142 #1, #3; 5 CR p. 154 #2, #3; 6.1 p. 158, pp. 163–164; 6.2 pp. 170–175; 6.3 p. 180, p. 182; 6 CR p. 186 #7, #10	5 CA #3, #8; 6 CA #17; U2 PT3 #1–4
(iii) relate the functions of different types of biomolecules, including proteins to the structure of a cell	5.3 pp. 141–142; 5.3 SR p. 142 #1, #4; 5.4 pp. 149–150; 5 CR p. 154 #2, #3; 6.1 p. 163; 6.2 pp. 173–174; 6 CR p. 186 #9; 11.1 p. 330	5 CA #4, #6, #8; 6 CA #16; U2 PT3 #1–4
(iv) relate the functions of different types of biomolecules, including nucleic acids, to the structure of a cell	5.3 pp. 140–141; 5.3 SR p. 142 #1; 5 CR p. 154 #1–3; 6.1 p. 158, pp. 160–161; 11.1 pp. 326–329	5 CA #8; U2 PT3 #1–4; CI 11A
(v) relate the functions of different types of biomolecules, including carbohydrates, to the function of a cell	5.3 pp. 136–138; 5.4 p. 147; 6.3 pp. 177–179	8 CA #2
(vi) relate the functions of different types of biomolecules, including lipids, to the function of a cell	5.3 pp. 138–139; 5 CR p. 155 #12; 6.1 pp. 160–161, 164; 6.2 pp. 170–175; 6.3 p. 180, p. 182; 6 CR p. 186 #7, #10	5 CA #14; 6 CA #17
(vii) relate the functions of different types of biomolecules, including proteins, to the function of a cell	5.3 pp. 141–142; 5 Explorer p. 144; 5.4 pp. 149–150; 6.1 p. 163; 6.2 pp. 173–174; 11.1 p. 330	5 CA #13; 6 CA #16; CI 11A
(viii) relate the functions of different types of biomolecules, including nucleic acids, to the function of a cell	1.1 p. 6; 5.3 p. 140; 6.1 p. 158, pp. 160–161; 11.1 pp. 326–329	1 CA #2, #4; CI 11A
(B) compare and contrast prokaryotic and eukaryotic cells, including their complexity, and compare and contrast scientific explanations for cellular complexity;		
(i) compare prokaryotic and eukaryotic cells, including their complexity	6 CS p. 157; 6.1 pp. 158–161, pp. 163–166; 6.1 SR p. 166 #1–4; 6.2 p. 171; 6.3 p. 177; 6 CR pp. 186–187 #1–3, #7, #9, #10, #12–14, #16; U2 Activity p. 211; 8.1 p. 219; 8.2 p. 227; 8.2 SR p. 233 #1; 8 ML p. 234 #1, #3; 8 CR p. 254 #1; 11.3 SR p. 351 #3	6 CA #1–4, #13; 8 CA #5, #6, #16
(ii) contrast prokaryotic and eukaryotic cells, including their complexity	6 CS p. 157; 6.1 pp. 158–161, pp. 163–166; 6.1 SR p. 166 #2, #4; 6.2 p. 171; 6.3 p. 177; 6 CR pp. 186–187 #1–3, #7, #9, #10, #12–14, #16; U2 Activity p. 211; 8.1 p. 219; 8.2 p. 227; 8 ML p. 234 #3; 8 CR pp. 254–255 #1, #5, #11; 11.3 SR p. 351 #3	6 CA #1–4, #13; 8 CA #4, #6, #16; CI 11B
(iii) compare and contrast scientific explanations for cellular complexity	6.1 p. 166; 7.3 pp. 201–203; 8 CR p. 255 #11	CI 8A
(C) investigate homeostasis through the cellular transport of molecules; and		
(i) investigate homeostasis through the cellular transport of molecules	5.3 pp. 138–139; 6.1 pp. 163–164; 6.2 pp. 170–175; 6.2 SR p. 175 #1–3; 6 ML p. 176 #1–4; 6.3 p. 180, p. 182; 6 CR p. 187 Math/LA #1; U3 Activity p. 319	6 CA #4–6, #14–17; CI 9A; CI 10A; U3 PT2 #1–3
(D) compare the structures of viruses to cells and explain how viruses spread and cause disease.		
(i) compare the structures of viruses to cells	8.4 pp. 244–245; 8.4 SR p. 250 #1–3; 8 CR p. 254 #6	8 CA #11, #17
(ii) explain how viruses spread disease	8.4 pp. 244–250; 8.4 SR p. 250 #1, #2, #4; 8 CR p. 254 #7, #8, #10; 8 Explorer p. 252; 13.3 pp. 421–425; U4 Activity p. 431	8 CA #10–12, #17
(iii) explain how viruses cause disease	8.4 pp. 246–250; 8.4 SR p. 250 #3, #4; 8 CR p. 255 Math/LA #3; 11 CR p. 355 RP #1, #2; 13.3 pp. 421–425	

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(6) Science concepts—biological structures, functions, and processes. The student knows how an organism grows and the importance of cell differentiation. The student is expected to:		
(A) explain the importance of the cell cycle to the growth of organisms, including an overview of the stages of the cell cycle and deoxyribonucleic acid (DNA) replication models;		
(i) explain the importance of the cell cycle to the growth of organisms, including an overview of the stages of the cell cycle	7.1 pp. 190–192; 7.1 SR p. 194 #2, #3; 7.2 pp. 197–199; 7.2 SR p. 199 #3; 7 ML p. 200 #1–4; 7 CR pp. 208–209 #1–3, #6, #7, #11–13, Math/LA #2; 12.1 SR p. 366 #1, #3; 12 CR p. 388 #2	7 CA #1–3, #6–9, #13, #14, #16; CI 7A; U2 PT1 #3, #4
(ii) explain the importance of the cell cycle to the growth of organisms, including deoxyribonucleic acid (DNA) replication models	7.1 SR p. 194 #4; 7.2 pp. 196–199; 7.2 SR p. 199 #1, #2; 7 CR pp. 208–209 #1, #10, #11; 11.2 pp. 336–337	1 CA #2; 7 CA #5
(B) explain the process of cell specialization through cell differentiation, including the role of environmental factors; and		
(i) explain the process of cell specialization through cell differentiation, including the role of environmental factors	7.3 pp. 201–204; 7.3 SR p. 204 #1–3; 7 CR pp. 208–209 #5, #8, #14, Math/LA #3, #4; 11.3 p. 345–351	7 CA #10–12; CI 7B; U2 PT1 #1–4
(C) relate disruptions of the cell cycle to how they lead to the development of diseases such as cancer.		
(i) relate disruptions of the cell cycle to how they lead to the development of diseases such as cancer	7.1 pp. 192–193; 7.1 SR p. 194 #3, #4; 7 LAD p. 195 #1–4; 7 Explorer p. 206; 7 CR p. 208 #4, #9, #10	7 CA #3; CI 7A
(7) Science concepts—mechanisms of genetics. The student knows the role of nucleic acids in gene expression. The student is expected to:		
(A) identify components of DNA, explain how the nucleotide sequence specifies some traits of an organism, and examine scientific explanations for the origin of DNA;		
(i) identify components of DNA	5.3 pp. 139–140; 11.1 pp. 326–329; 11.1 SR p. 333 #1; 11.2 p. 337, p. 341; 11.2 SR p. 343 #1, #3; 11 CR pp. 354–355 #1–8, #12, #13–15, Math/LA #4, #5	11 CA #3, #4, #13, #14, #16; 12 CA #1; CI 14A; CI 14B
(ii) explain how the nucleotide sequence specifies some traits of an organism	5.3 p. 140; 8 LAD p. 243 #1, #3–5; 8.4 p. 245; 11.1 pp. 327–329; 11.2 pp. 338–341; 11 TIAT p. 353 #2, #3; 11 CR pp. 354–355 #7, RP #1; 12.1 p. 361; 12 Explorer p. 367; 12 CR p. 388 #1	1 CA #2; 11 CA #2; CI 13A; CI 14A; CI 14B
(iii) examine scientific explanations for the origin of DNA	11.1 pp. 332–333; 11.1 SR p. 333 #4	
(B) describe the significance of gene expression and explain the process of protein synthesis using models of DNA and ribonucleic acid (RNA);		
(i) describe the significance of gene expression	7.1 pp. 192–193; 7.3 p. 201; 11.1 pp. 330–331; 11.1 SR p. 333 #2; 11.3 pp. 345–351; 11.3 SR p. 351 #2–4; 11 LAD p. 352 #3, #4; 11 CR pp. 354–355 #4–6, #8–14, #16, #17, Math/LA #1, #2; 12 Explorer p. 367; 12.4 pp. 381–385; 12.4 SR p. 385 #3, #4; 12 CR p. 389 #13, #14	11 CA #1, #7–10, #12, #17; CI 11A; U4 PT2 #1–4; U4 PT3 #1–3; 14 CA #7, #12; U5 PT2 #1–3
(ii) explain the process of protein synthesis using models of DNA	11.1 p. 329, p. 331; 11.1 SR p. 333 #2; 11.2 p. 336, pp. 338–343; 11.2 SR p. 343 #2–4; 11 ML p. 344 #1, #2, #4; 11.3 SR p. 351 #1, #3, #4; 12.2 p. 368	11 CA #5–10, #12, #13, #15; CI 11A
(iii) explain the process of protein synthesis using models of ribonucleic acid (RNA)	11.1 p. 329, p. 331; 11.1 SR p. 333 #2, #3; 11.2 p. 336, pp. 338–343; 11.2 SR p. 343 #2–4; 11 ML p. 344 #1, #2, #4; 11.3 SR p. 351 #1, #3, #4	11 CA #5–10, #12, #13, #15; CI 11A

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(C) identify and illustrate changes in DNA and evaluate the significance of these changes; and		
(i) identify changes in DNA	12.2 pp. 368–371; 12 CR pp. 388–389 #4, #12, RP #1, #2; 14.3 p. 461; 14.3 SR p. 461 #4	12 CA #5, #6, #12, #16; U4 PT1 #2–4
(ii) illustrate changes in DNA	12.2 pp. 368–371; 12.2 SR p. 371 #1–4	U4 PT1 #2–4
(iii) evaluate the significance of changes [in DNA]	1.1 p. 6; 12.2 pp. 368–371; 12.2 SR p. 371 #1–4; 12 CR pp. 388–389 #4, #12, RP #1, #2	11 CA #11; 12 CA #5, #6, #12, #16; U4 PT1 #2–4
(D) discuss the importance of molecular technologies such as polymerase chain reaction (PCR), gel electrophoresis, and genetic engineering that are applicable in current research and engineering practices.		
(i) discuss the importance of molecular technologies that are applicable in current research	13.1 pp. 392–399; 13.1 SR p. 399 #1–4; 13.2 pp. 402–412; 13 ML p. 426 #1–4; 13 CR pp. 428–429 #1–4, #10, #11, Math/LA #1, #3	13 CA #1–4, #11–15; CI 13A; CI 13B
(ii) discuss the importance of molecular technologies that are applicable in current engineering practices	13.1 pp. 392–399; 13.1 SR p. 399 #1–4; 13.2 pp. 402–412; 13.2 SR p. 412 #1–4; 13 Explorer p. 413; 13 LAD p. 415 #1–5; 13.3 p. 416, pp. 418–420, p. 422, p. 425; 13.3 SR p. 425 #1–3; 13 ML p. 426 #1–4; 13 TIAT p. 427 #1–4; 13 CR pp. 428–429 #1–14; Math/LA #1–4, RP #1, #2	13 CA #1–15
(8) Science concepts—mechanisms of genetics. The student knows the role of nucleic acids and the principles of inheritance and variation of traits in Mendelian and non-Mendelian genetics. The student is expected to:		
(A) analyze the significance of chromosome reduction, independent assortment, and crossing-over during meiosis in increasing diversity in populations of organisms that reproduce sexually; and		
(i) analyze the significance of chromosome reduction in increasing diversity in populations of organisms that reproduce sexually	9 CR p. 286 #12; 12.1 pp. 360–361, p. 363, pp. 365–366; 12.1 SR p. 366 #1, #3; 12 CR p. 388 #2; 14 CR p. 465 #10	12 CA #2, #14
(ii) analyze the significance of independent assortment in increasing diversity in populations of organisms that reproduce sexually	12.1 pp. 360–361, pp. 365–366; 12.1 SR p. 366 #2–4; 12 CR pp. 388–389 #2, #3, #10, Math/LA #1, #2; 14 CR p. 465 #10	12 CA #2, #3, #13, #14; CI 12A; CI 12B
(iii) analyze the significance of crossing-over in increasing diversity in populations of organisms that reproduce sexually	12.1 pp. 360–361, p. 364, p. 366; 12.1 SR p. 366 #1–3; 12 CR pp. 388–389 #2, #3, #10, Math/LA #2; 14 CR p. 465 #10; 15.2 p. 477	12 CA #2, #4, #14; CI 12B
(B) predict possible outcomes of various genetic combinations using monohybrid and dihybrid crosses, including non-Mendelian traits of incomplete dominance, codominance, sex-linked traits, and multiple alleles.		
(i) predict possible outcomes of various genetic combinations using monohybrid crosses, including non-Mendelian traits of incomplete dominance	12.3 pp. 376–377, p. 379; 12.3 SR p. 379 #1, #2, #4; 12 LAD p. 380 #2; 12.4 pp. 381–382; 12.4 SR p. 385 #1; 12 CR p. 388 #5	12 CA #11, #17
(ii) predict possible outcomes of various genetic combinations using monohybrid crosses, including non-Mendelian traits of codominance	12.3 pp. 376–377, p. 379; 12.3 SR p. 379 #1, #3; 12 LAD p. 380 #1, #3; 12.4 pp. 381–382; 12 TIAT p. 387 #3; 12 CR p. 388 #5	12 CA #10, #11, #17, #19; CI 12A
(iii) predict possible outcomes of various genetic combinations using monohybrid crosses, including non-Mendelian traits of sex-linked traits	12.3 p. 379; 12.4 p. 381, pp. 383–384; 12.4 SR p. 385 #2; 12 CR pp. 388–389 #6, #9, Math/LA #4; 16 TIAT p. 527 #1	12 CA #18, #21; CI 12B; U4 PT1 #1–4

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(iv) predict possible outcomes of various genetic combinations using monohybrid crosses, including non-Mendelian traits of multiple alleles	12.3 pp. 376–377, p. 379; 12 LAD p. 380 #1–3; 12.4 pp. 381–382; 12 CR pp. 388–389 #8, Math/LA #5	12 CA #9; CI 12A
(v) predict possible outcomes of various genetic combinations using dihybrid crosses, including non-Mendelian traits of incomplete dominance	12.3 p. 376, pp. 378–379; 12.4 p. 381; 12 CR p. 388 #7	12 CA #7, #8
(vi) predict possible outcomes of various genetic combinations using dihybrid crosses, including non-Mendelian traits of codominance	12.3 p. 376, pp. 378–379; 12.4 p. 382; 12 CR p. 388 #7	CI 12A
(vii) predict possible outcomes of various genetic combinations using dihybrid crosses, including non-Mendelian traits of sex-linked traits	12.3 p. 376, pp. 378–379; 12.4 p. 384; 12 CR p. 388 #9	U4 PT1 #1–4
(viii) predict possible outcomes of various genetic combinations using dihybrid crosses, including non-Mendelian traits of multiple alleles	12.3 p. 376, pp. 378–379; 12.4 p. 382	CI 12A
(9) Science concepts—biological evolution. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life that has multiple lines of evidence. The student is expected to:		
(A) analyze and evaluate how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies, including anatomical, molecular, and developmental; and		
(i) analyze how evidence of common ancestry among groups is provided by the fossil record	14.1 p. 439; 14.1 SR p. 443 #2; 14 ML p. 444 #1–3; 14.2 pp. 445–449; 14.2 SR p. 452 #1, #3–5; 14.3 SR p. 461 #3; 14 CR pp. 464–465 #3, #4, #8, #11, #15, RP #1; 16 CR p. 528 #3	14 CA #1, #2, #4–6, #8, #15; CI 14B
(ii) analyze how evidence of common ancestry among groups is provided by biogeography	14.1 p. 439; 14.1 SR p. 443 #2; 14.3 SR p. 461 #3; 14 CR pp. 464–465 #8, #15, RP #1; 15.1 p. 469	14 CA #2, #6
(iii) analyze how evidence of common ancestry among groups is provided by homologies, including anatomical	14.1 pp. 439–440; 14.1 SR p. 443 #2; 14.3 pp. 457–458; 14.3 SR p. 461 #1, #3; 14 CR pp. 464–465 #5, #8, #9, #15, RP #1	14 CA #2, #6, #13; U5 PT1 #1–4
(iv) analyze how evidence of common ancestry among groups is provided by homologies, including molecular	14.1 p. 439; 14.1 SR p. 443 #2; 14.2 SR p. 452 #2; 14.3 p. 456, pp. 459–460; 14.3 SR p. 461 #2, #3; 14 TIAT p. 463 #1, #2; 14 CR pp. 464–465 #8, #13–15, RP #1	CI 8A; 14 CA #2, #6, #12, #14; CI 14A; U5 PT1 #3, #4
(v) analyze how evidence of common ancestry among groups is provided by homologies, including developmental	14.1 p. 439; 14.1 SR p. 443 #2; 14.3 pp. 456–457, p. 461; 14 CR pp. 464–465 #2, #6, #8, #15, RP #1	14 CA #2, #6
(vi) evaluate how evidence of common ancestry among groups is provided by the fossil record	14.1 p. 439; 14.1 SR p. 443 #2; 14 ML p. 444 #1–3; 14.2 pp. 445–449; 14.2 SR p. 452 #1, #3–5; 14 CR pp. 464–465 #3, #4, #11; 15.1 p. 475	14 CA #1, #4, #5, #8, #15; CI 14B
(vii) evaluate how evidence of common ancestry among groups is provided by biogeography	14.1 p. 439; 14.1 SR p. 443 #2; 15.1 p. 469; 15.1 SR p. 475 #1; 15 CR p. 492 #1	
(viii) evaluate how evidence of common ancestry among groups is provided by homologies, including anatomical	14.1 pp. 439–440; 14.1 SR p. 443 #2; 14.3 pp. 457–458; 14.3 SR p. 461 #1; 14 CR p. 464 #5, #9; 15.1 p. 472	14 CA #13; 15 CA #2; U5 PT1 #1–4

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(ix) evaluate how evidence of common ancestry among groups is provided by homologies, including molecular	14.1 p. 439; 14.2 SR p. 452 #2; 14.3 p. 456, pp. 459–460; 14.3 SR p. 461 #2; 14 TIAT p. 463 #1, #2; 14 CR p. 465 #13, #14; 15 Explorer p. 490	1 CA #11; 14 CA #12, #14; CI 14A; U5 PT1 #3, #4
(x) evaluate how evidence of common ancestry among groups is provided by homologies, including developmental	14.1 p. 439; 14.3 pp. 456–457, p. 461; 14 CR p. 464 #2, #6	
(B) examine scientific explanations for varying rates of change such as gradualism, abrupt appearance, and stasis in the fossil record.		
(i) examine scientific explanations for varying rates of change	14.2 p. 452; 14 CR p. 465 #12; 15 CR p. 493 #13; 16.1 pp. 500–501; 16 CR p. 528 #2	14 CA #11; 16 CA #14
(10) Science concepts—biological evolution. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life that has multiple mechanisms. The student is expected to:		
(A) analyze and evaluate how natural selection produces change in populations and not in individuals;		
(i) analyze how natural selection produces change in populations and not in individuals	15.1 p. 468, p. 470, p. 473; 15.1 SR p. 475 #2; 15 ML p. 476 #1–3; 15.2 pp. 477–482; 15.2 SR p. 482 #1–3; 15 TIAT p. 491 #3; 15 CR pp. 492–493 #2, Math/LA #3; 16.1 SR p. 501 #1, #2	15 CA #12, #13
(ii) evaluate how natural selection produces change in populations and not in individuals	1.1 SR p. 7 #2; 1 CR p. 35 #9, Math/LA #1; 15.1 pp. 468–474; 15.2 pp. 477–482; 15.2 SR p. 482 #1–3; 15 LAD p. 485 #1–6; 15 TIAT p. 491 #3; 16.1 SR p. 501 #2	15 CA #13
(B) analyze and evaluate how the elements of natural selection, including inherited variation, the potential of a population to produce more offspring than can survive, and a finite supply of environmental resources, result in differential reproductive success;		
(i) analyze how the elements of natural selection, including inherited variation result in differential reproductive success	15.1 p. 473; 15.1 SR p. 475 #3, #4; 15.2 p. 479, p. 481; 15 CR pp. 492–493 #3, #10, Math/LA #2, RP #1; 16.1 SR p. 501 #2–4	15 CA #1, #3–5; CI 15B; U5 PT2 #1, #2
(ii) analyze how the elements of natural selection, including the potential of a population to produce more offspring than can survive result in differential reproductive success	4.2 SR p. 101 #2; 4.3 SR p. 107 #1; 15.1 p. 473; 15.1 SR p. 475 #3, #4; 15.2 pp. 480–481; 15 CR pp. 492–493 #3, #4, #10, RP #1; 16.1 SR p. 501 #2–4	U1 PT3 #3; 15 CA #5; U5 PT2 #1, #2
(iii) analyze how the elements of natural selection, including a finite supply of environmental resources, result in differential reproductive success	4.2 SR p. 101 #2; 4.3 SR p. 107 #1; 10 CR p. 316 #4; 15.1 p. 473; 15.1 SR p. 475 #3, #4; 15.2 pp. 480–481; 15 CR pp. 492–493 #3, #10, Math/LA #2, RP #1; 16.1 SR p. 501 #1–4	15 CA #5; CI 16A; U5 PT2 #1, #2
(iv) evaluate how the elements of natural selection, including inherited variation result in differential reproductive success	1 CR p. 35 #9; 10.4 p. 312; 15.1 pp. 472–475; 15.2 p. 477, pp. 479–482; 16.1 SR p. 501 #2–4	1 CA #3, #13; U1 PT3 #3; CI 15B; U5 PT2 #1, #2
(v) evaluate how the elements of natural selection, including the potential of a population to produce more offspring than can survive result in differential reproductive success	4.2 SR p. 101 #1; 4.3 SR p. 107 #4; 15.1 pp. 472–475; 15.2 pp. 479–481; 15 CR p. 492 #3, #4	
(vi) evaluate how the elements of natural selection, including a finite supply of environmental resources, result in differential reproductive success	15.1 pp. 472–474; 15.2 p. 480, p. 482; 15 CR p. 493 Math/LA #3, RP #1	CI 16A

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(C) analyze and evaluate how natural selection may lead to speciation; and		
(i) analyze how natural selection may lead to speciation	16.1 pp. 496–500; 16 TIAT p. 527 #2; 16 CR p. 528 #1, #2; U5 Activity p. 531	16 CA #1–3, #13; CI 16A; U5 PT3 #1–4
(ii) evaluate how natural selection may lead to speciation	16.1 pp. 496–501; 16 TIAT p. 527 #2; 16 CR p. 528 #1, #2	16 CA #1–3, #13; CI 16A; U5 PT3 #1–4
(D) analyze evolutionary mechanisms other than natural selection, including genetic drift, gene flow, mutation, and genetic recombination, on the gene pool of a population.		
(i) analyze evolutionary mechanisms other than natural selection, including genetic drift	15.3 pp. 486–487; 15.3 SR p. 489 #1, #3; 16.1 p. 496	15 CA #14; CI 15A
(ii) analyze evolutionary mechanisms other than natural selection, including gene flow	15.3 p. 486	CI 15A
(iii) analyze evolutionary mechanisms other than natural selection, including mutation	15.2 p. 478, p. 482; 15.3 SR p. 489 #1, #3; 15 CR p. 493 #10	
(iv) analyze evolutionary mechanisms other than natural selection, including genetic recombination	15.2 pp. 477–478	
(v) analyze [genetic drift’s] effect on the gene pool of a population	15.3 pp. 486–487; 15.3 SR p. 489 #1, #3; 15 CR p. 492 #5; 16.1 p. 496	15 CA #14; CI 15A
(vi) analyze [gene flow’s] effect on the gene pool of a population	15.2 p. 482; 15.3 p. 486; 15.3 SR p. 489 #1, #3; 15 CR p. 492 #5, #9	15 CA #10; CI 15A
(vii) analyze [mutation’s] effect on the gene pool of a population	15.2 p. 478, p. 482; 15.3 SR p. 489 #1, #3; 15 CR pp. 492–493 #5, #9, #10	15 CA #10
(viii) analyze [genetic recombination’s] effect on the gene pool of a population	15.2 p. 477, p. 482; 15.3 SR p. 489 #1; 15 CR p. 492 #5	
(11) Science concepts—biological structures, functions, and processes. The student knows the significance of matter cycling, energy flow, and enzymes in living organisms. The student is expected to:		
(A) explain how matter is conserved and energy is transferred during photosynthesis and cellular respiration using models, including the chemical equations for these processes; and		
(i) explain how matter is conserved during photosynthesis using models, including the chemical equations for these processes	2.4 p. 59; 6.3 p. 177, pp. p. 182–183; 6.3 SR p. 183 #1; 6 TIAT p. 185 #1, #2; 6 CR pp. 186–187 #4–6, #17, Math/LA #2	2 CA #4; 6 CA #7, #10, #11; CI 6B; U2 PT2 #1, #3, #4
(ii) explain how matter is conserved during cellular respiration using models, including the chemical equations for these processes	2.4 p. 59; 6.3 pp. 177–181; 6.3 SR p. 183 #1; 6 CR pp. 186–187 #5, #6, #8, #11, #15, #17	6 CA #8, #10, #12, #17; CI 6A; U2 PT2 #1, #3, #4
(iii) explain how energy is transferred during photosynthesis using models, including the chemical equations for these processes	2.1 p. 45; 2.1 SR p. 45 #4; 2.2 p. 46; 2.3 p. 51; 2.4 SR p. 63 #1; 2 CR p. 66 #8; 6.3 pp. 177–178, pp. 182–183; 6.3 SR p. 183 #1; 6 TIAT p. 185 #1, #2; 6 CR pp. 186–187 #4–6, #17, Math/LA #2	2 CA #11; U1 PT2 #1; 6 CA #7, #9–11; CI 6B; U2 PT2 #1, #3, #4
(iv) explain how energy is transferred during cellular respiration using models, including the chemical equations for these processes	2.1 p. 45; 2.1 SR p. 45 #4; 2.2 p. 46; 2.3 p. 51; 2.4 SR p. 63 #1; 2 CR p. 66 #8; 6.3 pp. 177–181; 6.3 SR p. 183 #1; 6 CR pp. 186–187 #5, #6, #8, #11, #15, #17	U1 PT2 #1; 6 CA #8–10, #12, #17; CI 6A; U2 PT2 #1, #3, #4
(B) investigate and explain the role of enzymes in facilitating cellular processes.		
(i) investigate the role of enzymes in facilitating cellular processes	5.4 pp. 148–150; 6.2 p. 171; 6.3 p. 180, p. 183; 6.3 SR p. 183 #2; 8 CR p. 255 #13; 10.3 p. 300; 11.2 pp. 336–338	
(ii) explain the role of enzymes in facilitating cellular processes	5.4 pp. 148–150; 6.2 p. 171; 6.3 p. 180, p. 183; 6.3 SR p. 183 #2; 8 CR p. 255 #13; 11.2 pp. 336–338; 11.2 SR p. 343 #1, #3; 11 CR p. 354 #3, #13	

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(12) Science concepts—biological structures, functions, and processes. The student knows that multicellular organisms are composed of multiple systems that interact to perform complex functions. The student is expected to:		
(A) analyze the interactions that occur among systems that perform the functions of regulation, nutrient absorption, reproduction, and defense from injury or illness in animals; and		
(i) analyze the interactions that occur among systems that perform the function of regulation	6 CR p. 187 #15, RP #1, #2; 10.2 SR p. 298 #2; 10.3 pp. 300–302; 10.3 SR p. 302 #1–3; 10 LAD p. 303 #1; 10 TIAT p. 315 #1; 10 CR pp. 316–317 #2, #3, #5, #12, #13, Math/LA #2	10 CA #4, #6, #11, #12, #13; CI 10A; U3 PT2 #1–3; U3 PT3 #1–3
(ii) analyze the interactions that occur among systems that perform the function of nutrient absorption	10.2 pp. 294–296; 10.2 SR p. 298 #2; 10 CR p. 316 #5	U3 PT3 #1–3
(iii) analyze the interactions that occur among systems that perform the function of reproduction	10.2 p. 294; 10 CR p. 316 #5	10 CA #5
(iv) analyze the interactions that occur among systems that perform the function of defense from injury or illness in animals	10.2 p. 295, pp. 297–298; 10.2 SR p. 298 #3; 10 CR p. 316 #5	
(B) explain how the interactions that occur among systems that perform functions of transport, reproduction, and response in plants are facilitated by their structures.		
(i) explain how the interactions that occur among systems that perform [function] of transport [is] facilitated by their structures	8 CR p. 254 #4; 9.1 pp. 258–260, p. 262; 9.1 SR p. 263 #1, #3; 9 ML p. 264 #1–4; 9.2 pp. 265–269; 9.2 SR p. 269 #1–4; 9.4 p. 283; 9.4 SR p. 283 #1; 9 TIAT p. 285 #2; 9 CR pp. 286–287 #1–4, #10, #11, #15, #17, Math/LA #1; 10 CR p. 316 #7	U1 PT3 #2; 9 CA #1–6, #13, #14; CI 9A; U3 PT1 #1–4
(ii) explain how the interactions that occur among systems that perform [function] of reproduction [is] facilitated by their structures	9.1 pp. 258–259; 9.1 SR p. 263 #2; 9.3 pp. 271–277; 9.3 SR p. 277 #1–4; 9 CR pp. 286–287 #1, #5–7, #12, #13, #18, Math/LA #2, #4; 10 CR p. 316 #8	U1 PT3 #2; 9 CA #5, #7–11, #13, #16
(iii) explain how the interactions that occur among systems that perform [function] of response in plants [is] facilitated by their structures	9.1 p. 258; 9.1 SR p. 263 #3; 9 ML p. 264 #1–4; 9.2 p. 268; 9.2 SR p. 269 #1–3; 9.3 p. 275; 9.4 pp. 279–283; 9.4 SR p. 283 #1–3; 9 TIAT p. 285 #1, #2; 9 CR pp. 286–287 #3, #4, #8, #9, #11, #14, #16, RP #1	U1 PT3 #2; 9 CA #2, #4–6, #12–15, #17, #18; CI 9B; U3 PT1 #1–4
(13) Science concepts—interdependence within environmental systems. The student knows that interactions at various levels of organization occur within an ecosystem to maintain stability. The student is expected to:		
(A) investigate and evaluate how ecological relationships, including predation, parasitism, commensalism, mutualism, and competition, influence ecosystem stability;		
(i) investigate how ecological relationships, including predation influence ecosystem stability	3.1 p. 70; 3.1 SR p. 72 #2; 4.3 p. 104, p. 106; 4.3 SR p. 107 #2, #3	U1 PT1 #2; U1 PT3 #2; U1 PT4 #1
(ii) investigate how ecological relationships, including parasitism influence ecosystem stability	3.1 p. 71; 3.1 SR p. 72 #3; 4.3 pp. 104–105; 4 CR p. 113 #15	U1 PT1 #2; U1 PT3 #2; U1 PT4 #1
(iii) investigate how ecological relationships, including commensalism influence ecosystem stability	3.1 pp. 71–72; 3.1 SR p. 72 #3; 3 CR p. 89 RP #1, #2	U1 PT1 #2; U1 PT3 #2; U1 PT4 #1

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(iv) investigate how ecological relationships, including mutualism influence ecosystem stability	3.1 p. 71; 3.1 SR p. 72 #3; 3 CR p. 88 #3; 8.3 p. 237; 9 CR p. 287 RP #1; U3 Activity p. 319; 16.1 p. 500	U1 PT1 #2; U1 PT3 #2; U1 PT4 #1
(v) investigate how ecological relationships, including competition, influence ecosystem stability	3.1 p. 70; 3.1 SR p. 72 #2; 3 CR p. 89 #10; 4.1 p. 95; 4.1 SR p. 95 #2–4; 4.3 p. 104	U1 PT1 #2; U1 PT3 #2; U1 PT4 #1
(vi) evaluate how ecological relationships, including predation influence ecosystem stability	3.1 p. 70; 3.1 SR p. 72 #2; 3 CR p. 88 #2; 4.3 p. 104, p. 106; 4.3 SR p. 107 #2, #3; U1 Activity p. 115	3 CA #2, #3, #13; 4 CA #5; U1 PT2 #3
(vii) evaluate how ecological relationships, including parasitism influence ecosystem stability	3.1 pp. 71–72; 3.1 SR p. 72 #3; 3 CR p. 88 #3; 4.3 pp. 104–105; 8.3 SR p. 241 #4	3 CA #3; U1 PT2 #3
(viii) evaluate how ecological relationships, including commensalism influence ecosystem stability	3.1 pp. 71–72; 3.1 SR p. 72 #3; 3 CR p. 88 #3; 3 CR p. 89 RP #1, #2	U1 PT2 #3
(ix) evaluate how ecological relationships, including mutualism influence ecosystem stability	3.1 pp. 71–72; 3.1 SR p. 72 #3; 3 CR p. 88 #3; 8.3 p. 238; 8.3 SR p. 241 #2; 8 CR p. 254 #4	3 CA #1; U1 PT2 #3; 8 CA #9
(x) evaluate how ecological relationships, including competition, influence ecosystem stability	3.1 p. 70; 3.1 SR p. 72 #2; 3 CR pp. 88–89 #2, #10; 4.1 p. 95; 4.1 SR p. 95 #2–4; 4.2 pp. 99–100; 4.3 p. 104; U1 Activity p. 115	3 CA #2, #12, #13; 4 CA #6, #11; U1 PT2 #3
(B) analyze how ecosystem stability is affected by disruptions to the cycling of matter and flow of energy through trophic levels using models;		
(i) analyze how ecosystem stability is affected by disruptions to the cycling of matter through trophic levels using models	2.1 pp. 43–45; 2.2 pp. 46–47, p. 49; 2.2 SR p. 49 #4; 2.3 p. 51, pp. 53–54; 2.4 p. 60; 2 CR pp. 66–67 #2, #10, #11; 6 Explorer p. 184	CI 2A ; CI 2B ; CI 3B ; CI 4A ; U1 PT1 #3; U1 PT2 #2–4; U1 PT3 #1, #4; U1 PT4 #2; U1 PT5 #3; U2 PT2 #2–4
(ii) analyze how ecosystem stability is affected by disruptions to the flow of energy through trophic levels using models	2.1 pp. 43–45; 2.2 pp. 46–47, p. 49; 2.2 SR p. 49 #4; 2.3 pp. 51–54; 2 CR pp. 66–67 #2, #11; 6 Explorer p. 184	U1 PT2 #3, #4; U2 PT2 #2–4
(C) explain the significance of the carbon and nitrogen cycles to ecosystem stability and analyze the consequences of disrupting these cycles; and		
(i) explain the significance of the carbon cycle to ecosystem stability	2.1 SR p. 45 #4; 2.4 p. 57, p. 59, p. 62; 2 CR p. 67 #10, #11; 6 CR p. 187 #17	U1 PT1 #1
(ii) explain the significance of the nitrogen cycle to ecosystem stability	2.1 SR p. 45 #4; 2.4 p. 57, p. 60, pp. 62–63; 2 CR p. 66 #9; 8.1 p. 221	
(iii) analyze the consequences of disrupting [the carbon cycle]	2.4 p. 57, p. 59, p. 62; 2 CR p. 67 #10, #11	U1 PT1 #1
(iv) analyze the consequences of disrupting [the nitrogen cycle]	2.3 p. 52; 2.4 p. 57, p. 60, pp. 62–63	

STANDARD	STUDENT/TEACHER EDITION	ONLINE RESOURCES
(D) explain how environmental change, including change due to human activity, affects biodiversity and analyze how changes in biodiversity impact ecosystem stability.		
(i) explain how environmental change, including change due to human activity, affects biodiversity	2.1 p. 42; 2.3 p. 54; 2.3 SR p. 54 #3; 2.4 p. 58, p. 62; 3 Explorer p. 73; 3.2 pp. 74–75, p. 78; 3.2 SR p. 78 #1; 3 LAD p. 79 #1–4; 3.3 pp. 80–85; 3.3 SR p. 85 #1–4; 3 ML p. 86 #4, #5; 3 TIAT p. 87 #1, #3; 3 CR pp. 88–89 #4, #6, #8, #9, #11, #13, RP #1, #2; 4.1 p. 95; 4.2 pp. 98–99; 4 Explorer p. 102; 4.3 pp. 105–106; 4 LAD p. 110 #2, #3; 4 TIAT p. 111 #1–3; 4 CR pp. 112–113 #3–5, #7, #12, #16–18, Math/LA #1, RP #1, #2; 9 CR p. 287 Math/LA #5; 16.2 pp. 502–503, pp. 506–508; 16.2 SR p. 508 #4; 16.3 pp. 513–518; 16.3 SR p. 518 #3, #4; 16.4 pp. 520–522; 16 ML p. 526 #3; 16 TIAT p. 527 #3; 16 CR pp. 528–529 #4, #10, #13, #14, RP #1; U5 Activity p. 531	2 CA #10; 3 CA #4, #6–11, #14, #15, #17; CI 3A; 4 CA #2, #4, #7, #8, #11, #12; CI 4A; U1 PT1 #4; U1 PT4 #2, #3; U1 PT5 #2, #3; U3 PT3 #2, #3; 16 CA #5–9, #11, #12, #16–20; CI 16B; U5 PT4 #1–5; U5 PT5 #1–3
(ii) analyze how changes in biodiversity impact ecosystem stability	2.2 p. 49; 2 Explorer p. 50; 2 CR p. 67 #10, #11; 3 Explorer p. 73; 3.2 pp. 74–76, p. 78; 3.2 SR p. 78 #1–3; 3 LAD p. 79 #3–5; 3.3 pp. 80–82, pp. 84–85; 3.3 SR p. 85 #2–4; 3 TIAT p. 87 #2; 3 CR pp. 88–89 #4–9, #11–14, Math/LA #1–3, RP #1, #2; 4.2 p. 101; 4.3 pp. 105–106; 4 LAD p. 110 #1–4; 4 TIAT p. 111 #1–3; 4 CR pp. 112–113 #8, Math/LA #1; 9 CR p. 287 Math/LA #3; 16.2 p. 503, p. 506, p. 508; 16.3 pp. 514–518; 16.4 p. 521, pp. 523–525	3 CA #5, #6, #8, #10, #11, #16; 4 CA #5, #6, #10; U1 PT1 #4; 9 CA #18

English Language Proficiency Standards

The **English Language Proficiency Standards for Science** offer support for second-language acquisition throughout the text using a variety of approaches for reading, writing, speaking, and listening. All Roman numeral breakouts listed in this table are required for Science courses 6–12. Breakouts for student-facing ELPS have supporting **Acquire English Worksheets** available digitally that offer opportunities for students to work individually or in small groups. Breakouts that are teacher-facing only are indicated with an asterisk.

SCIENCE	
STANDARD	STUDENT/TEACHER EDITION
(c) Cross-curricular second language acquisition essential knowledge and skills	
(1) Cross-curricular second language acquisition/learning strategies. The ELL uses language learning strategies to develop an awareness of his or her own learning processes in all content areas. In order for the ELL to meet grade-level learning expectations across the foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student’s level of English language proficiency. The student is expected to:	
(A) use prior knowledge and experiences to understand meanings in English;	
(i) use prior knowledge to understand meanings in English	13.3 p. 419
(ii) use prior experiences to understand meanings in English	5.2 p. 130; 10.3 p. 301
(B) monitor oral and written language production and employ self-corrective techniques or other resources;	
(i) monitor oral language production and employ self-corrective techniques or other resources*	6.1 p. 164; 13 CS p. 391; 14.2 p. 448

STANDARD	STUDENT/TEACHER EDITION
(C) use strategic learning techniques such as concept mapping, drawing, memorizing, comparing, contrasting, and reviewing to acquire basic and grade-level vocabulary;	1.1 p. 6; 1.3 p. 18; 2.4 p. 58, p. 62; 4.1 p. 92; 5.1 p. 126; 8.2 p. 232; 15.2 p. 477
(D) speak using learning strategies such as requesting assistance, employing non-verbal cues, and using synonyms and circumlocution (conveying ideas by defining or describing when exact English words are not known);	
(i) speak using learning strategies	9 Explorer p. 278; 10.3 p. 301; 16.1 p. 496
(E) internalize new basic and academic language by using and reusing it in meaningful ways in speaking and writing activities that build concept and language attainment;	
(i) internalize new basic language by using and reusing it in meaningful ways in speaking activities that build concept and language attainment	5.2 p. 130
(ii) internalize new basic language by using and reusing it in meaningful ways in writing activities that build concept and language attainment	14.2 p. 445
(iii) internalize new academic language by using and reusing it in meaningful ways in speaking activities that build concept and language attainment	7.3 p. 202; 12.2 p. 370
(iv) internalize new academic language by using and reusing it in meaningful ways in writing activities that build concept and language attainment	2.4 p. 58; 9.2 p. 266; 9.4 p. 280
(F) use accessible language and learn new and essential language in the process;	
(i) use accessible language and learn new and essential language in the process*	14.2 p. 445
(G) demonstrate an increasing ability to distinguish between formal and informal English and an increasing knowledge of when to use each one commensurate with grade-level learning expectations;	12 Explorer p. 367
(H) develop and expand repertoire of learning strategies such as reasoning inductively or deductively, looking for patterns in language, and analyzing sayings and expressions commensurate with grade-level learning expectations.	4.1 p. 92; 5.1 p. 126; 12.4 p. 383; 14.1 p. 439; 14.1 442; 15.3 p. 487
(2) Cross-curricular second language acquisition/listening. The ELL listens to a variety of speakers including teachers, peers, and electronic media to gain an increasing level of comprehension of newly acquired language in all content areas. ELLs may be at the beginning, intermediate, advanced, or advanced high stage of English language acquisition in listening. In order for the ELL to meet grade-level learning expectations across the foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student’s level of English language proficiency. The student is expected to:	
(A) distinguish sounds and intonation patterns of English with increasing ease;	4 Explorer p. 102; 8.3 p. 235; 10 Explorer p. 314; 13.2 p. 402
(B) recognize elements of the English sound system in newly acquired vocabulary such as long and short vowels, silent letters, and consonant clusters;	8.3 p. 235; 10 Explorer p. 314; 13.2 p. 402
(C) learn new language structures, expressions, and basic and academic vocabulary heard during classroom instruction and interactions;	
(i) learn new language structures heard during classroom instruction and interactions*	U1 Explorer p. 39; 15 LAD p. 484
(ii) learn new expressions heard during classroom instruction and interactions*	14.1 p. 442; 15.3 p. 487

STANDARD	STUDENT/TEACHER EDITION
(iii) learn basic vocabulary heard during classroom instruction and interactions	5.2 p. 130; 14.2 p. 445
(iv) learn academic vocabulary heard during classroom instruction and interactions	15 LAD p. 484
(D) monitor understanding of spoken language during classroom instruction and interactions and seek clarification as needed;	
(i) monitor understanding of spoken language during classroom instruction and interactions*	6.2 p. 174
(ii) seek clarification [of spoken language] as needed	6.2 p. 174
(E) use visual, contextual, and linguistic support to enhance and confirm understanding of increasingly complex and elaborated spoken language;	11 CS p. 325; 14.1 p. 441
(iii) use linguistic support to enhance and confirm understanding of increasingly complex and elaborated spoken language	U1 Explorer p. 39
(F) listen to and derive meaning from a variety of media such as audio tape, video, DVD, and CD ROM to build and reinforce concept and language attainment;	U1 Explorer p. 39; U2 Explorer p. 119; U3 Explorer p. 215; 9.4 p. 280; 10.4 p. 306
(G) understand the general meaning, main points, and important details of spoken language ranging from situations in which topics, language, and contexts are familiar to unfamiliar;	U2 Explorer p. 119; 6.2 p. 174; U3 Explorer p. 215; U4 Explorer p. 323; 11 CS p. 325; U5 Explorer p. 435; 16 Explorer p. 509
(H) understand implicit ideas and information in increasingly complex spoken language commensurate with grade-level learning expectations; and	U4 Explorer p. 323; 16 Explorer p. 509
(I) demonstrate listening comprehension of increasingly complex spoken English by following directions, retelling or summarizing spoken messages, responding to questions and requests, collaborating with peers, and taking notes commensurate with content and grade-level needs.	U3 Explorer p. 215
(i) demonstrate listening comprehension of increasingly complex spoken English by following directions commensurate with content and grade-level needs	1.2 p. 13
(iii) demonstrate listening comprehension of increasingly complex spoken English by responding to questions and requests commensurate with content and grade-level needs	U5 Explorer p. 435
(iv) demonstrate listening comprehension of increasingly complex spoken English by collaborating with peers commensurate with content and grade-level needs*	U5 Explorer p. 435
(v) demonstrate listening comprehension of increasingly complex spoken English by taking notes commensurate with content and grade-level needs	U2 Explorer p. 119
(3) Cross-curricular second language acquisition/speaking. The ELL speaks in a variety of modes for a variety of purposes with an awareness of different language registers (formal/informal) using vocabulary with increasing fluency and accuracy in language arts and all content areas. ELLs may be at the beginning, intermediate, advanced, or advanced high stage of English language acquisition in speaking. In order for the ELL to meet grade-level learning expectations across the foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student’s level of English language proficiency. The student is expected to:	
(A) practice producing sounds of newly acquired vocabulary such as long and short vowels, silent letters, and consonant clusters to pronounce English words in a manner that is increasingly comprehensible;	1.1 p. 6; 8.3 p. 235; 10 Explorer p. 314; 13.2 p. 402

STANDARD	STUDENT/TEACHER EDITION
(B) expand and internalize initial English vocabulary by learning and using high-frequency English words necessary for identifying and describing people, places, and objects, by retelling simple stories and basic information represented or supported by pictures, and by learning and using routine language needed for classroom communication;	15.1 p. 469
(ii) expand and internalize initial English vocabulary by retelling simple stories and basic information represented or supported by pictures	10.1 p. 290; 13.1 p. 392
(iii) expand and internalize initial English vocabulary by learning and using routine language needed for classroom communication	15 LAD p. 484
(C) speak using a variety of grammatical structures, sentence lengths, sentence types, and connecting words with increasing accuracy and ease as more English is acquired;	12.2 p. 369; 12.4 p. 383
(D) speak using grade-level content area vocabulary in context to internalize new English words and build academic language proficiency;	
(i) speak using grade-level content area vocabulary in context to internalize new English words	5.1 p. 126
(ii) speak using grade-level content area vocabulary in context to build academic language proficiency	12.2 p. 370
(E) share information in cooperative learning interactions	
(i) share information in cooperative learning interactions	U3 Summary p. 318; U5 Summary p. 530
(F) ask and give information ranging from using a very limited bank of high-frequency, high-need, concrete vocabulary, including key words and expressions needed for basic communication in academic and social contexts, to using abstract and content-based vocabulary during extended speaking assignments;	
(i) ask [for] information ranging from using a very limited bank of high-frequency, high-need, concrete vocabulary, including key words and expressions needed for basic communication in academic and social contexts, to using abstract and content-based vocabulary during extended speaking assignments	11.3 p. 345
(ii) give information ranging from using a very limited bank of high-frequency, high-need, concrete vocabulary, including key words and expressions needed for basic communication in academic and social contexts, to using abstract and content-based vocabulary during extended speaking assignments	7.3 p. 202; 11.3 p. 345
(G) express opinions, ideas, and feelings ranging from communicating single words and short phrases to participating in extended discussions on a variety of social and grade-appropriate academic topics;	
(i) express opinions ranging from communicating single words and short phrases to participating in extended discussions on a variety of social and grade-appropriate academic topics*	4 On Assignment p.108; 5.4 p. 146; 11.3 p. 350
(ii) express ideas ranging from communicating single words and short phrases to participating in extended discussions on a variety of social and grade-appropriate academic topics	5.4 p. 146; 11.3 p. 350

STANDARD	STUDENT/TEACHER EDITION
(H) narrate, describe, and explain with increasing specificity and detail as more English is acquired;	15.1 p. 471
(ii) describe with increasing specificity and detail as more English is acquired	16.3 p. 512
(iii) explain with increasing specificity and detail as more English is acquired	16.3 p. 512
(I) adapt spoken language appropriately for formal and informal purposes; and	12 Explorer p. 367
(J) respond orally to information presented in a wide variety of print, electronic, audio, and visual media to build and reinforce concept and language attainment.	U1 Explorer p. 39; 10.4 p. 306; U5 Explorer p. 435
(4) Cross-curricular second language acquisition/reading. The ELL reads a variety of texts for a variety of purposes with an increasing level of comprehension in all content areas. ELLs may be at the beginning, intermediate, advanced, or advanced high stage of English language acquisition in reading. In order for the ELL to meet grade-level learning expectations across the foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student’s level of English language proficiency. For Kindergarten and Grade 1, certain of these student expectations apply to text read aloud for students not yet at the stage of decoding written text. The student is expected to:	
(A) learn relationships between sounds and letters of the English language and decode (sound out) words using a combination of skills such as recognizing sound-letter relationships and identifying cognates, affixes, roots, and base words;	2.1 p. 42; 6 CS p. 157; 7.1 p. 192; 8.3 p. 235; 9 CS p. 257; 9.1 p. 260; 10 Explorer p. 314; 11.2 p. 341; 13.2 p. 402; 14.3 p. 459
(B) recognize directionality of English reading such as left to right and top to bottom;	8.1 p. 221; 13.1 p. 392
(C) develop basic sight vocabulary, derive meaning of environmental print, and comprehend English vocabulary and language structures used routinely in written classroom materials;	
(i) develop basic sight vocabulary used routinely in written classroom materials	1 Explorer p. 32
(ii) derive meaning of environmental print	16.2 p. 506
(iii) comprehend English vocabulary used routinely in written classroom materials	15 LAD p. 484
(iv) comprehend English language structures used routinely in written classroom materials	10 CS p. 289; 15 LAD p. 484
(D) use prereading supports such as graphic organizers, illustrations, and pretaught topic-related vocabulary and other prereading activities to enhance comprehension of written text;	
(i) use prereading supports to enhance comprehension of written text	1 CS p. 3; 1.2 p. 10; 5 CS p. 121
(E) read linguistically accommodated content area material with a decreasing need for linguistic accommodations as more English is learned;	
(i) read linguistically accommodated content area material with a decreasing need for linguistic accommodations as more English is learned*	8.4 p. 248; 10 CS p. 289

STANDARD	STUDENT/TEACHER EDITION
(F) use visual and contextual support and support from peers and teachers to read grade-appropriate content area text, enhance and confirm understanding, and develop vocabulary, grasp of language structures, and background knowledge needed to comprehend increasingly challenging language;	2.1 p. 42
(i) use visual and contextual support to read grade-appropriate content area text	8.2 p. 227
(ii) use visual and contextual support to enhance and confirm understanding	10.1 p. 290
(iii) use visual and contextual support to develop vocabulary needed to comprehend increasingly challenging language	1 CS p. 3; 11.2 p. 337; 16.4 p. 523
(v) use visual and contextual support to develop background knowledge needed to comprehend increasingly challenging language	5 CS p. 121; 11.2 p. 337
(vi) use support from peers and teachers to read grade-appropriate content area text	2 Explorer p. 50; 8.4 p. 248; 13.2 p. 408; 15 CS p. 467; 16.1 p. 496
(vii) use support from peers and teachers to enhance and confirm understanding	2 CS p. 41; 3 CS p. 69; 4 CS p. 91; 5.3 p. 134; U3 Summary p. 318
(viii) use support from peers and teachers to develop vocabulary needed to comprehend increasingly challenging language	11.2 p. 337; 14.2 p. 448; 15.1 p. 469
(ix) use support from peers and teachers to develop grasp of language structures needed to comprehend increasingly challenging language	10 CS p. 289
(x) use support from peers and teachers to develop background knowledge needed to comprehend increasingly challenging language	14.2 p. 445
(G) demonstrate comprehension of increasingly complex English by participating in shared reading, retelling or summarizing material, responding to questions, and taking notes commensurate with content area and grade level needs;	2 Explorer p. 50; 3.3 p. 84; 15 CS p. 467
(ii) demonstrate comprehension of increasingly complex English by retelling or summarizing material commensurate with content area and grade level needs	2 CS p. 41; 4 CS p. 91; 7 CS p. 189; 8.1 p. 218
(iii) demonstrate comprehension of increasingly complex English by responding to questions commensurate with content area and grade level needs	3 CS p. 69; 4 Explorer p. 102; 5.3 p. 134
(iv) demonstrate comprehension of increasingly complex English by taking notes commensurate with content area and grade level needs	6.1 p. 158; 12.1 p. 358
(H) read silently with increasing ease and comprehension for longer periods;	12 CS p. 357; 13.2 p. 408
(I) demonstrate English comprehension and expand reading skills by employing basic reading skills such as demonstrating understanding of supporting ideas and details in text and graphic sources, summarizing text, and distinguishing main ideas from details commensurate with content area needs;	3 CS p. 69; 5.3 p. 134; 8 CS p. 217; 8.1 p. 221; U4 Summary p. 430; U5 Summary p. 530

STANDARD	STUDENT/TEACHER EDITION
<p>(J) demonstrate English comprehension and expand reading skills by employing inferential skills such as predicting, making connections between ideas, drawing inferences and conclusions from text and graphic sources, and finding supporting text evidence commensurate with content area needs; and</p>	<p>6 Explorer p. 184; 10.2 p. 297; 14 CS p. 437; 15.3 p. 487; 16 CS p. 495; 16.3 p. 516</p>
<p>(K) demonstrate English comprehension and expand reading skills by employing analytical skills such as evaluating written information and performing critical analyses commensurate with content area and grade-level needs.</p>	<p>1 On Assignment p. 17; U4 Explorer p. 322; 13.1 p. 397</p>
<p>(5) Cross-curricular second language acquisition/writing. The ELL writes in a variety of forms with increasing accuracy to effectively address a specific purpose and audience in all content areas. ELLs may be at the beginning, intermediate, advanced, or advanced high stage of English language acquisition in writing. In order for the ELL to meet grade-level learning expectations across foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student’s level of English language proficiency. For Kindergarten and Grade 1, certain of these student expectations do not apply until the student has reached the stage of generating original written text using a standard writing system. The student is expected to:</p>	
<p>(A) learn relationships between sounds and letters of the English language to represent sounds when writing in English;</p>	<p>1.1 p. 6; 11.1 p. 329</p>
<p>(B) write using newly acquired basic vocabulary and content-based grade-level vocabulary;</p>	
<p>(i) write using newly acquired basic vocabulary</p>	<p>14.2 p. 445</p>
<p>(ii) write using content-based grade-level vocabulary</p>	<p>9.2 p. 266; 9.4 p. 280</p>
<p>(C) spell familiar English words with increasing accuracy, and employ English spelling patterns and rules with increasing accuracy as more English is acquired;</p>	<p>1.1 p. 6; 1 LAD p. 31; 11.1 p. 329</p>
<p>(D) edit writing for standard grammar and usage, including subject-verb agreement, pronoun agreement, and appropriate verb tenses commensurate with grade-level expectations as more English is acquired;</p>	<p>1 On Assignment p. 16; U2 Activity p. 211; 13.3 p. 417</p>
<p>(E) employ increasingly complex grammatical structures in content area writing commensurate with grade level expectations such as (i) using correct verbs, tenses, and pronouns/antecedents; (ii) using possessive case (apostrophe -s) correctly; and, (iii) using negatives and contractions correctly</p>	<p>1 On Assignment p. 16; 1 LAD p. 31; 9.4 p. 282; p. 12 Explorer 367; 13.3 p. 417; 14.2 p. 451</p>
<p>(F) write using a variety of grade-appropriate sentence lengths, patterns, and connecting words to combine phrases, clauses, and sentences in increasingly accurate ways as more English is acquired; and</p>	<p>U3 Activity p. 319; 12 TIAT p. 387; 16 p. 505</p>
<p>(G) narrate, describe, and explain with increasing specificity and detail to fulfill content area writing needs as more English is acquired.</p>	<p>13.3 p. 417; U4 Activity p. 431</p>