CR – Constructed Response Tasks
RST-reading in Science and Technology
WHST-writing in
History/Science/Technology
CCLS-Common Core Learning Standards
Glencoe Science Biology:
The Dynamics of Life

WSWHE BOCES Living Environment Year 1
Scope, Sequence, and Timeline/Curriculum Map

TOPIC	Days	Objectives (New York State Living Environment Core Curriculum)	ELA CCLS	Essential Questions	Resources	Vocabulary	Recommended Assessments

Biology: The Study of Life -Benefits of studying biology -Characterisitics of living things -Scientific method processes -Quantitative vs qualitive information -Science vs technology	23	Standard 1 Students will use mathematical analysis, scientific inquiry, and engineering design,as appropriate, to pose questions, seek answers, and develop solutions. Key Idea 1 The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing and creative process. **Performance Indicator 1.1** Elaborate on basic scientific and personal explanations of natural phenomena, and develop extended visual models and mathematical formulations to represent one's thinking. Major Understandings: a. Scientific explanations are built by combining evidence that can be observed with what people already know about the world. b. Learning about the historical development of scientific concepts or about individuals who have contributed to scientific knowledge provides a better understanding of scientific inquiry and the relationship between science and society. c. Science provides knowledge, but values are also essential to making effective and ethical decisions about the application of scientific . **Performance Indicator 1.3** Work toward reconciling competing explanations; clarify points of agreement and disagreement. Major Understandings: a. Scientific explanations are accepted when they are consistent with experimental and observational	RST.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. RST.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 *grades 11–12 texts and topics* RST.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 WHST.1 Cite arguments focused on *discipline-specific content*. a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and	Why is it important to study Biology? What is the process for scientific problem solving? Why can't science and technology solve all problems?	**Chapter 1 textbook Chapter**. 1 Sections1.1, 1.2, 1.3 textbook notes sheets Chp. 1 vocabulary sheets Vocabulary crossword puzzles **Unit 1 Chapter 1 Resources Book:** Minilabs, Biolab, Reinforcement/Study Guide, Concept mapping, problem-solving, section focus **Laboratory Manual Chapter 1 labs** **Biologycorner.com labs**: *Where do plants get their food lab? *Sponge capsules *Identifying controls and variables *Scientific Method in Action **Sciencespot.net labs**: *Scientific Method-Controls and Variables-Part 1	Biology Organism Organization Reproduction Species Growth Development Environment Stimulus Response Homeostasis Energy Adaptation Evolution Scientific- Method Hypothesis Experiment Control Independent-variable Dependent-variable Safety-symbol Data Theory Ethics Technology	RST.1 1.1,1.2,1.3 Section Assessments (CR) Lab activity questions (CR) RST.4 Chapter 1 Vocabulary Quizzes Chapter 1 What is Biology? Assessment (CR) RST.8 Lab activity questions (CR) WHST.1 Lab activities analysis and conclusions (CR) WHST.2 Lab experiment procedure questions Performance Indicator 1.1-Lab experiments /data gathering and analysis

		evidence and when they lead to accurate predictions. b. All scientific explanations are tentative and subject to change or improvement. Each new bit of evidence can create more questions than it answers. This leads to increasingly better understanding of how things work in the living **Performance Indicator 1.4** Coordinate explanations at different levels of scale, points of focus, and degrees of complexity and specificity, and recognize the need for such alternative representations of the natural world. Major Understandings: a. Well-accepted theories are ones that are supported by different kinds of scientific investigations often involving the contributions of individuals from different disciplines. Key Idea 2 Beyond the use of reasoning and consensus, scientific inquiry involves the testing of proposed explanations involving the use of conventional techniques and procedures and usually requiring considerable ingenuity. **Performance Indicator 2.1** Devise ways of making observations to test proposed explanations. **Performance Indicator 2.3** Develop and present proposals including formal hypotheses to test explanations; i.e., predict what should be observed under specific conditions if the explanation is true.	evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented. WHST.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures,				Performance Indicator 1.3- Analysis of lab experiment hypotheses Performance Indicator 1.4- Scientific inquiry process in lab experiments Performance Indicator 2.1-data table completion Performance Indicator 2.3 lab experiment hypothesis construction Performance Indicator 2.4 lab experiment design and set up

		Major Understandings: a. Hypotheses are predictions based upon both research and observation. b. Hypotheses are widely used in science for determining what data to collect and as a guide for interpreting the data. c. Development of a research plan for testing a hypothesis requires planning to avoid bias (e.g., repeated trials, large sample size, and objective data-collection techniques). **Performance Indicator 2.4** Carry out a research plan for testing explanations, including selecting and developing techniques, acquiring and building apparatus, and recording observations as necessary. Key Idea 3 The observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insights into natural phenomena. **Performance Indicator 3.1** Use various methods of representing and organizing observations (e.g., diagrams, tables, charts, graphs, equations, matrices) and insightfully interpret the organized data. **Performance Indicator 3.3** Assess correspondence between the predicted result contained in the hypotheses and actual result, and reach a conclusion as to whether the explanation on which the prediction was based is supported. **Performance Indicator 3.4** Based on the results of the test and through public discussion, revise the	tables), and multimedia when useful to aiding comprehension. b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).				Performance Indicator 3.1graphing data Performance Indicator 3.3 hypothesis evaluation

		explanation and contemplate additional research. Major Understandings: a. Hypotheses are valuable, even if they turn out not to be true, because they may lead to further investigation. b. Claims should be questioned if the data are based on samples that are very small, biased, or inadequately controlled or if the conclusions are based on the faulty, incomplete, or misleading use of numbers. c. Claims should be questioned if fact and opinion are intermingled, if adequate evidence is not cited, or if the conclusions do not follow logically from the evidence given.					Performance Indicator 3.4 class discussion regarding future experimentation

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Principles of Ecology -Biotic and abiotic factors -Levels of biological organization -Ecological relationships -Niche/habitat -Nutrition needs of organisms -Flow of energy -Cycles in nature -Food webs/chains	14	Standard 4 Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. Key Idea 1 Living things are both similar to and different from each other and from nonliving things. **Performance Indicator 1.1** Explain how diversity of populations within ecosystems relates to the stability of ecosystems. Major Understandings: a. Populations can be categorized by the function they serve. Food webs identify the relationships among producers, consumers, and decomposers carrying out either autotropic or heterotropic nutrition. b. An ecosystem is shaped by the nonliving environment as well as its interacting species. The world contains a wide diversity of physical conditions, which creates a variety of environments. c. In all environments, organisms compete for vital resources. The linked and changing interactions of populations and the environment compose the total ecosystem. d. The interdependence of organisms in an established ecosystem often results in approximate stability over hundreds and thousands of years. For example, as one population increases, it is held in check by one or more environmental factors or another species. e. Ecosystems, like many other complex systems, tend to show cyclic changes around a state of approximate equilibrium .	RST.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. RST.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 *grades 11–12 texts and topics* RST.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 WHST.1 Cite arguments focused on *discipline-specific content*. a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while	Why are different important in the environment? How is biological organization important to our world? How is the path of energy important in an ecosystem?	**Chapter 2 textbook** Chapter 2 Sections 2.1, 2.2, textbook notes sheets Chapter 2 vocabulary sheets Vocabulary crossword puzzles **Unit 2 Chapter 2 Resources Book:** Minilabs, Biolab, Reinforcement/Study Guide, Concept mapping, problem-solving, section focus **Laboratory Manual Chapter 2 lab** **Jason.org lab:** Cycling carbon **Biologycorner.com labs:** *Food Webs *Plant and Animal-Mini Ecosystem **Vtaide.com lab** *Food chains & food webs *Create a Food	Ecology Biosphere Abiotic-factor Biotic-factor Population Biological-community Ecosystem Habitat Niche Symbiosis Commensalism Mutualism Parasitism Autotroph Heterotroph Decomposer Food chain Trophic level Food web Biomass	RST.1 2.1, 2.2 Section Assessments (CR) Lab activity questions (CR) RST.4 Chapter 2 Vocabulary Quizzes Chapter 2 Principles of Ecology Assessment (CR) RST.8 Lab activity questions (CR) WHST.1 Lab activities analysis and conclusions (CR) WHST.2 Lab experiment procedure questions Performance Indicator 1.1 section assessment 2.2

		f. Every population is linked, directly or indirectly, with many others in an ecosystem. Disruptions in the numbers and types of species and environmental changes can upset ecosystem stability. Key Idea 6 Plants and animals depend on each other and their physical environment. **Performance Indicator 6.1** Explain factors that limit growth of individuals and populations. Major Understandings: a. Energy flows through ecosystems in one direction, typically from the Sun, through photosynthetic organisms including green plants and algae, to herbivores to carnivores and decomposers. b.The atoms and molecules on the Earth cycle among the living and nonliving components of the biosphere. For example, carbon dioxide and water molecules used in photosynthesis to form energy-rich organic compounds are returned to the environment when the energy in these compounds is eventually released by cells. Continual input of energy from sunlight keeps the process going. This concept may be illustrated with an energy pyramid. c. The chemical elements, such as carbon, hydrogen, nitrogen, and oxygen, that make up the molecules of living things pass through food webs and are combined and recombined in different ways. At each link in a food web, some energy is stored in newly made structures but much is dissipated into the environment as heat. d. The number of organisms any habitat can support (carrying capacity) is limited by the available energy, water, oxygen,	pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented. WHST.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures,		Web Kesab Patawalonga and Torrens Waterwatch Food Web worksheet		Performance Indicator 6.1- section assessment 2.1, 2.2 Performance Indicator 7.1- chapter 2 assessment Performance Indicator 7.3- waterwatch food web worksheet

		and minerals, and by the ability of ecosystems to recycle the residue of dead organisms through the activities of bacteria and fungi. e. In any particular environment, the growth and survival of organisms depend on the physical conditions including light intensity, temperature range, mineral availability, soil/rock type, and relative acidity (pH). f. Living organisms have the capacity to produce populations of unlimited size, but environments and resources are finite. This has profound effects on the interactions among organisms. g. Relationships between organisms may be negative, neutral, or positive. Some organisms may interact with one another in several ways. They may be in a producer/consumer, predator/prey, or parasite/host relationship; or one organism may cause disease in, scavenge, or decompose another. Key Idea 7 Human decisions and activities have had a profound impact on the physical and living environment. Performance Indicator 7.1 Describe the range of interrelationships of humans with the living and nonliving environment. Major Understandings: a. The Earth has finite resources; increasing human consumption of resources places stress on the natural processes that renew some resources and deplete those resources that cannot be renewed. b. Natural ecosystems provide an array of basic processes that affect humans. Those processes include but are not limited to: maintenance of the quality of the atmosphere, generation of soils, control of the water cycle,	tables), and multimedia when useful to aiding comprehension. b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).				

		removal of wastes, energy flow, and recycling of nutrients. Humans are changing many of these basic processes and the changes may be detrimental. c. Human beings are part of the Earth's ecosystems. Human activities can, deliberately or inadvertently, alter the equilibrium in ecosystems. Humans modify ecosystems as a result of population growth, consumption, and technology. Human destruction of habitats through direct harvesting, pollution, atmospheric changes, and other factors is threatening Performance Indicator 7.2 Explain the impact of technological development and growth in the human population on the living and nonliving environment. Major Understandings: a. Human activities that degrade ecosystems result in a loss of diversity of the living and nonliving environment. For example, the influence of humans on other organisms occurs through land use and pollution. Land use decreases the space and resources available to other species, and pollution changes the chemical composition of air, soil, and water. b. When humans alter ecosystems either by adding or removing specific organisms, serious consequences may result. For example, planting large expanses of one crop reduces the biodiversity of the area. c. Industrialization brings an current global stability, and if not addressed, ecosystems may be irreversibly affected. increased demand for and use of energy and other resources including fossil and nuclear fuels. This usage can have positive and negative effects on humans and ecosystems.					

		Performance Indicator 7.3 Explain how individual choices and societal actions can contribute to improving the environment. Major Understandings: a. Societies must decide on proposals which involve the introduction of new technologies. Individuals need to make decisions which will assess risks, costs, benefits, and trade-offs. b. The decisions of one generation both provide and limit the range of possibilities open to the next generation.					

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Communities and Biomes -Communities -Ecological succession -Biomes	14	Standard 4 Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. Key Idea 1 Living things are both similar to and different from each other and from nonliving things. **Performance Indicator 1.1** Explain how diversity of populations within ecosystems relates to the stability of ecosystems. Major Understandings: a. Populations can be categorized by the function they serve. Food webs identify the relationships among producers, consumers, and decomposers carrying out either autotropic or heterotropic nutrition. b. An ecosystem is shaped by the nonliving environment as well as its interacting species. The world contains a wide diversity of physical conditions, which creates a variety of environments. c. In all environments, organisms compete for vital resources. The linked and changing interactions of populations and the environment compose the total ecosystem. d. The interdependence of organisms in an established ecosystem often results in approximate stability over hundreds and thousands of years. For example, as one population increases, it is held in check by one or more environmental factors or another species. e. Ecosystems, like many other complex systems, tend to show cyclic changes around a state of approximate	RST.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. RST.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 *grades 11–12 texts and topics* RST.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 WHST.1 Cite arguments focused on *discipline-specific content*. a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while	Why is it important to know about the variations, tolerences, and adaptations of plants and animals in their communities?	**Chapter 3 textbook** Chapter 3 Sections 3.1, 3.2 textbook notes sheets Chapter 3 vocabulary sheets Vocabulary crossword puzzles **Unit 2 Chapter 3 Resources Book:** Minilabs, Biolab, Reinforcement/Study Guide, Concept mapping, problem-solving, section focus **Laboratory Manual Chapter 3 lab** **Biologycorner.com labs:** *Biome map *Biome concept map project *Biomes at MoBot *Examining the Stages in Ecological Succession *Biome webquest *Dichotomous key labs	Limiting factor Tolerance Succession Primary-succession Climax-community Secondary-succession Biome Photic zone Aphotic zone Estuary Intertidal-zone Plankton Desert Grassland Temperate/Deciduous forest Tropical rain-forest	RST.1 3.1, 3.2 Section Assessments (CR) Lab activity questions (CR) RST.4 Chapter 3 Vocabulary Quizzes Chapter 3 Communities and Biomes Assessment (CR) RST.8 Lab activity questions (CR) WHST.1 Lab activities analysis and conclusions (CR) WHST.2 Lab experiment procedure questions Performance Indicator 1.1-Lab experiments /data gathering and analysis

		equilibrium. f. Every population is linked, directly or indirectly, with many others in an ecosystem. Disruptions in the numbers and types of species and environmental changes can upset ecosystem stability. Key Idea 6 Plants and animals depend on each other and their physical environment. **Performance Indicator 6.1** Explain factors that limit growth of individuals and populations. Major Understandings: a. Energy flows through ecosystems in one direction, typically from the Sun, through photosynthetic organisms including green plants and algae, to herbivores to carnivores and decomposers. b. The atoms and molecules on the Earth cycle among the living and nonliving components of the biosphere. For example, carbon dioxide and water molecules used in photosynthesis to form energy-rich organic compounds are returned to the environment when the energy in these compounds is eventually released by cells. Continual input of energy from sunlight keeps the process going. This concept may be illustrated with an energy pyramid. c. The chemical elements, such as carbon, hydrogen, nitrogen, and oxygen, that make up the molecules of living things pass through food webs and are combined and recombined in different ways. At each link in a food web, some energy is stored in newly made structures but much is dissipated into the environment as heat. d. The number of organisms any habitat can support (carrying capacity) is limited by the available energy, water,	pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented. WHST.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings),		**Thecephalopodpage.org labs:** Interpreting Graphics-Taxonomy		Performance Indicator 6.1-section assessment 3.1 Performance Indicator 6.3-section assessment 3.1 Performance Indicator 7.1-section assessment 3.1 Performance Indicator 7-3 section assessment 3.1

		oxygen, and minerals, and by the ability of ecosystems to recycle the residue of dead organisms through the activities of bacteria and fungi. e. In any particular environment, the growth and survival of organisms depend on the physical conditions including light intensity, temperature range, mineral availability, soil/rock type, and relative acidity (pH). f. Living organisms have the capacity to produce populations of unlimited size, but environments and resources are finite. This has profound effects on the interactions among organisms. g. Relationships between organisms may be negative, neutral, or positive. Some organisms may interact with one another in several ways. They may be in a producer/consumer, predator/prey, or parasite/host relationship; or one organism may cause disease in, scavenge, or decompose another. **Performance Indicator 6.3** Explain how the living and nonliving environments change over time and respond to disturbances. Major Understandings: a. The interrelationships and interdependencies of organisms affect the development of stable ecosystems. b. Through ecological succession, all ecosystems progress through a sequence of changes during which one ecological community modifies the environment, making it more suitable for another community. These long-term gradual changes result in the community reaching a point of stability that can last for hundreds	graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).				

		or thousands of years. c. A stable ecosystem can be altered, either rapidly or slowly, through the activities of organisms (including humans), or through climatic changes or natural disasters. The altered ecosystem can usually recover through gradual changes back to a point of long-term stability. Key Idea 7 Human decisions and activities have had a profound impact on the physical and living environment. **Performance Indicator 7.1** Describe the range of interrelationships of humans with the living and nonliving environment. Major Understandings: a. The Earth has finite resources; increasing human consumption of resources places stress on the natural processes that renew some resources and deplete those resources that cannot be renewed. b. Natural ecosystems provide an array of basic processes that affect humans. Those processes include but are not limited to: maintenance of the quality of the atmosphere, generation of soils, control of the water cycle, removal of wastes, energy flow, and recycling of nutrients. Humans are changing many of these basic processes and the changes may be detrimental. c. Human beings are part of the Earth's ecosystems. Human activities can, deliberately or inadvertently, alter the equilibrium in ecosystems. Humans modify ecosystems as a result of population growth, consumption, and technology. Human destruction of habitats through					

		direct harvesting, pollution, atmospheric changes, and other factors is threatening **Performance Indicator 7.2** Explain the impact of technological development and growth in the human population on the living and nonliving environment. Major Understandings: a. Human activities that degrade ecosystems result in a loss of diversity of the living and nonliving environment. For example, the influence of humans on other organisms occurs through land use and pollution. Land use decreases the space and resources available to other species, and pollution changes the chemical composition of air, soil, and water. b. When humans alter ecosystems either by adding or removing specific organisms, serious consequences may result. For example, planting large expanses of one crop reduces the biodiversity of the area. c. Industrialization brings an current global stability, and if not addressed, ecosystems may be irreversibly affected. increased demand for and use of energy and other resources including fossil and nuclear fuels. This usage can have positive and negative effects on humans and ecosystems.					

Population Biology -Population growth -Reproductive patterns -Limiting factors -Human population trends	22	Standard 4 Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. Key Idea 1 Living things are both similar to and different from each other and from nonliving things. Performance Indicator 1.1 Explain how diversity of populations within ecosystems relates to the stability of ecosystems. Major Understandings: a. Populations can be categorized by the function they serve. Food webs identify the relationships among producers, consumers, and decomposers carrying out either autotropic or heterotropic nutrition. b. An ecosystem is shaped by the nonliving environment as well as its interacting species. The world contains a wide diversity of physical conditions, which creates a variety of environments. c. In all environments, organisms compete for vital resources. The linked and changing interactions of populations and the environment compose the total ecosystem. d. The interdependence of organisms in an established ecosystem often results in approximate stability over hundreds and thousands of years. For example, as one population increases, it is held in check by one or more environmental factors or another species. e. Ecosystems, like many other complex systems, tend to show cyclic changes around a state of approximate equilibrium.	RST.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. RST.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 *grades 11–12 texts and topics* RST.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 WHST.1 Cite arguments focused on *discipline-specific content*. a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while	How is population growth effected by environmental factors?	**Chapter 4 textbook** Chapter 4 Sections 4.1, 4.2 textbook notes sheets Chapter 4 vocabulary sheets Vocabulary crossword puzzles **Unit 2 Chapter 4 Resources Book:** Minilabs, Biolab, Reinforcement/Study Guide, Concept mapping, problem-solving, section focus **Laboratory Manual Chapter 4 labs** **Biologycorner.com labs:** *Virtual Lab: Population Biology *Random sampling *Deer: Predation or Starvation *Demography lab *Are Zebra Mussels really Invading? *Germination	Exponential-growth Carrying-capacity Life History-pattern Density-Dependent-factor Density-Independent-factor Demography Birthrate Death rate Doubling time Age structure	RST.1 4.1, 4.2 Section Assessments (CR) Lab activity questions (CR) RST.4 Chapter 4 Vocabulary Quizzes Chapter 4 Population Biology Assessment (CR) RST.8 Lab activity questions (CR) WHST.1 Lab activities analysis and conclusions (CR) WHST.2 Lab experiment procedure questions Performance Indicator 1.1-deer:predation or starvation lab

		f. Every population is linked, directly or indirectly, with many others in an ecosystem. Disruptions in the numbers and types of species and environmental changes can upset ecosystem stability. Key Idea 6 Plants and animals depend on each other and their physical environment. **Performance Indicator 6.1** Explain factors that limit growth of individuals and populations. Major Understandings: a. Energy flows through ecosystems in one direction, typically from the Sun, through photosynthetic organisms including green plants and algae, to herbivores to carnivores and decomposers. b. The atoms and molecules on the Earth cycle among the living and nonliving components of the biosphere. For example, carbon dioxide and water molecules used in photosynthesis to form energy-rich organic compounds are returned to the environment when the energy in these compounds is eventually released by cells. Continual input of energy from sunlight keeps the process going. This concept may be illustrated with an energy pyramid. c. The chemical elements, such as carbon, hydrogen, nitrogen, and oxygen, that make up the molecules of living things pass through food webs and are combined and recombined in different ways. At each link in a food web, some energy is stored in newly made structures but much is dissipated into the environment as heat. d. The number of organisms any habitat can support (carrying capacity) is limited by the available energy, water, oxygen, and minerals, and by the ability of	pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented. WHST.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings),		Inhibitors *Estimating population size *Graphing the Human Population *Interpreting Ecological Data **Sciencebuddies.org lab:** Radiant radish seeds **Glencoe.mcgraw-hill.com lab:** Population Biology		Performance Indicator 6.1-deer:predation or starvation lab

		ecosystems to recycle the residue of dead organisms through the activities of bacteria and fungi. e. In any particular environment, the growth and survival of organisms depend on the physical conditions including light intensity, temperature range, mineral availability, soil/rock type, and relative acidity (PH). f. Living organisms have the capacity to produce populations of unlimited size, but environments and resources are finite. This has profound effects on the interactions among organisms. g. Relationships between organisms may be negative, neutral, or positive. Some organisms may interact with one another in several ways. They may be in a producer/consumer, predator/prey, or parasite/host relationship; or one organism may cause disease in, scavenge, or decompose another.	graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).				

Biological Diversity and Conservation -Biodiversity -Biodiversity threats -Conservation biology	12	Standard 4 Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. Key Idea 1 Living things are both similar to and different from each other and from nonliving things. **Performance Indicator 1.1** Explain how diversity of populations within ecosystems relates to the stability of ecosystems. Major Understandings: a. Populations can be categorized by the function they serve. Food webs identify the relationships among producers, consumers, and decomposers carrying out either autotropic or heterotropic nutrition. b. An ecosystem is shaped by the nonliving environment as well as its interacting species. The world contains a wide diversity of physical conditions, which creates a variety of environments. c. In all environments, organisms compete for vital resources. The linked and changing interactions of populations and the environment compose the total ecosystem. d. The interdependence of organisms in an established ecosystem often results in approximate stability over hundreds and thousands of years. For example, as one population increases, it is held in check by one or more environmental factors or another species. e. Ecosystems, like many other complex systems, tend to show cyclic	RST.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. RST.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 *grades 11–12 texts and topics* RST.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 WHST.1 Cite arguments focused on *discipline-specific content*. a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while	How is the biosphere affected by changes in biodiversity? Why is it important to protect biodiversity?	**Chapter 5 textbook** Chapter 5 Sections 5.1, 5.2 textbook notes sheets Chapter 5 vocabulary sheets Vocabulary crossword puzzles **Unit 2 Chapter 5 Resources Book:** Minilabs, Biolab, Reinforcement/Study Guide, Concept mapping, problem-solving, section focus **Laboratory Manual Chapter 5 lab** **Biologycorner labs:** *Algae lab *Investigate Causes of Endangered Species *Recycle city **Waterontheweb.org labs:** *Studying Modeling Water Quality	Biodiversity Extinction Endangered-species Threatened-species Habitat-fragmentation Edge effect Habitat-degradation Acid-precipitation Ozone layer Exotic species Conservation-biology Natural-resources Habitat-corridors Sustainable use Reintroduction-programs Captivity	RST.1 5.1, 5.2 Section Assessments (CR) Lab activity questions (CR) RST.4 Chapter 5 Vocabulary Quizzes Chapter 5 Biological Diversity and Conservation Assessment (CR) RST.8 Lab activity questions (CR) WHST.1 Lab activities analysis and conclusions (CR) WHST.2 Lab experiment procedure questions Performance Indicator 1.1-investigate causes of endangered

		changes around a state of approximate equilibrium. f. Every population is linked, directly or indirectly, with many others in an ecosystem. Disruptions in the numbers and types of species and environmental changes can upset ecosystem stability. Key Idea 6 Plants and animals depend on each other and their physical environment. **Performance Indicator 6.2** Explain the importance of preserving diversity of species and habitats. Major Understandings: a. As a result of evolutionary processes, there is a diversity of organisms and roles in ecosystems. This diversity of species increases the chance that at least some will survive in the face of large environmental changes. Biodiversity increases the stability of the ecosystem. b. Biodiversity also ensures the availability of a rich variety of genetic material that may lead to future agricultural or medical discoveries with significant value to humankind. As diversity is lost, potential sources of these materials may be lost with it.	pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented. WHST.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings),		*Studying Thermal Stratification		species lab Performance Indicator 6.2- section assessment 5.1

			graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).				

TOPIC	Days	Objectives New York State Living Environment Core Curriculum)	ELA CCLS	Essential Questions	Resources	Vocabulary	
The Chemistry of Life -Elements and compounds -Chemical reactions -Mixtures and solutions -Properties of water -Diffusion -Carbon and living organisms -Biological compounds	20	Standard 4 Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. Key Idea 5 Organisms maintain a dynamic equilibrium that sustains life. Performance Indicator 5.1 Explain the basic biochemical processes in living organisms and their importance in maintaining dynamic equilibrium. Major Understandings: a. The energy for life comes primarily from the Sun. Photosynthesis provides a vital connection between the Sun and the energy needs of living systems. b. Plant cells and some one-celled organisms contain chloroplasts, the site of photosynthesis. The process of photosynthesis uses solar energy to combine the inorganic molecules carbon dioxide and water into energy-rich organic compounds (e.g., glucose) and release oxygen to the environment. c. In all organisms, organic compounds can be used to assemble other molecules such as proteins, DNA, starch, and fats. The chemical energy stored in bonds can be used as a source of energy for life processes. d. In all organisms, the energy stored in organic molecules may be	RST.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. RST.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 *grades 11–12 texts and topics* RST.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 WHST.1 Cite arguments focused on *discipline-specific content*. a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the	Why are elements and compounds important to living things? How are water and its properties important to living things?	**Chapter 6 textbook** Chapter 6 Sections 6.1, 6.2, 6.3 textbook notes sheets Chapter 6 vocabulary sheets Vocabulary crossword puzzles **Unit 3 Chapter 6 Resources Book:** Minilabs, Biolab, Reinforcement/Study Guide, Concept mapping, problem-solving, section focus **Laboratory Manual Chapter 6 labs** **Sciencespot.com labs:** *Atomic basics *Bonding basics *Candy compounds *Balancing act	Element Atom Nucleus Isotope Compound Covalent bond Molecule Ion Ionic bond Metabolism Mixture Solution pH Acid Base Polar molecule Hydrogen bond Diffusion Dynamic-equilibrium Isomer Polymer Carbohydrate Lipid Protein Amino acid Peptide bond Enzyme Nucleic acid Nucleotide	RST.1 6.1, 6.2, 6.3 Section Assessments (CR) Lab activity questions (CR) RST.4 Chapter 6 Vocabulary Quizzes Chapter 6 Chemistry of Life Assessment (CR) RST.8 Lab activity questions (CR) WHST.1 Lab activities analysis and conclusions (CR) WHST.2 Lab experiment procedure questions

		released during cellular respiration. This energy is temporarily stored in ATP molecules. In many organisms, the process of cellular respiration is concluded in mitochondria, in which ATP is produced more efficiently, oxygen is used, and carbon dioxide and water are released as wastes. e. The energy from ATP is used by the organism to obtain, transform, and transport materials, and to eliminate wastes. f. Biochemical processes, both breakdown and synthesis, are made possible by a large set of biological catalysts called enzymes. Enzymes can affect the rates of chemical change. The rate at which components of the biosphere enzymes work can be influenced by internal environmental factors such as pH and temperature. g. Enzymes and other molecules, such as hormones, receptor molecules, and antibodies, have specific shapes that influence both how they function and how they interact with other molecules. .	claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented. WHST.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. a. Introduce a topic and		*Gummy Bear Lab **Lesson Plans Inc. 2011 labs:** *Macromolecule worksheet *Hydrogen Bond Lab **Lesson Plans Inc. 2008 labs:** *Lipid worksheet *Macromolecule Lab **Lesson Plans Inc. 2007 lab:** *Acid Base Lab **Joliet West High School labs:** Transportation in Plants **The Science Behind Our Food lab:** Bag O' Isotopes **Biologycorner.com labs:** *Acids, Bases, and Dissociation of Water *Enzyme lab **Young Engineer's**		Performance Indicator 5.1- proof of enzyme action lab

			organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or		**Club lab:** Will All Liquids Mix Together? **Serendiplbrynmar .edu/sci lab:** Who Took Jerell's iPod? Acids and Bases Testing lab Messing with Mixtures lab **Biology: Investigating Living Systems Lab Manual:** Proof of Enzyme Action		

			the significance of the topic).				
A View of the Cell -History of microscopes -Cell theory -Prokaryotes and eukarotes	20	**Performance indicator 1.2** a. Describe and explain the structures and functions of the human body at different organizational levels (e.g., systems, tissues, cells, organelles). b. Important levels of organization for structure and function include organelles, cells, tissues, organs, organ systems, and whole organisms. c. Humans are complex	RST.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. RST.4 Determine the meaning of symbols, key terms, and	Why are history and technology important in this study of cells? How is the composition of the cell	**Chapter 7 textbook** Chapter 7 Sections 7.1, 7.2, 7.3 textbook notes sheets Chapter 7 vocabulary sheets Vocabulary	Cell Compound-light-microscope Cell theory Electron-microscope Organelle Prokaryote Eukaryote Nucleus	RST.1 7.1, 7.2, 7.3 Section Assessments (CR) Lab activity questions (CR) RST.4

-Selective permeability -Cell membrane structure -Cell organelles		organisms. They require multiple systems for digestion, respiration, reproduction, circulation, excretion, movement, coordination, and immunity. The systems interact to perform the life functions. d. The components of the human body, from organ systems to cell organelles, interact to maintain a balanced internal environment. To successfully accomplish this, organisms possess a diversity of control mechanisms that detect deviations and make corrective actions. e. If there is a disruption in any human system, there may be a corresponding imbalance in homeostasis. f. The organs and systems of the body help to provide all the cells with their basic needs. The cells of the body are of different kinds and are grouped in ways that enhance how they function together. g. Cells have particular structures that perform specific jobs. These structures perform the actual work of the cell. Just as systems are coordinated and work together, cell parts must also be coordinated and work together. h. Each cell is covered by a membrane that performs a number of important functions for the cell. These include: separation from its outside environment, controlling which molecules enter and leave the cell, and recognition of chemical signals. The processes of diffusion and active transport are important in the movement of materials in and out of cells. i. Many organic and inorganic substances dissolved in cells allow necessary chemical reactions to take place in order to maintain life. Large organic food	other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11–12 texts and topics* RST.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 WHST.1 Cite arguments focused on *discipline-specific content*. a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create	plasm membrane important to living things? How is the structure and function of cell parts different between plants and animals?	crossword puzzles **Unit 3 Chapter 7 Resources Book:** Minilabs, Biolab, Reinforcement/Study Guide, Concept mapping, problem-solving, section focus **Laboratory Manual Chapter 7 labs** **Biologycorner.com labs:** *Cells Alive-Internet Lesson *Animal cell coloring *Animal cell coloring *Prokaryote coloring *Human cheek cell *Cell city analogy *Plant cell lab *Cheek cells *Comparing Plant and Animal cells *Diffusion Lab **Stevespanglerscience.com lab:** Growing Bacteria	Plasma-membrane Selective-permeability Phospholipid Fluid mosaic-model Transport-protein Cell wall Chromatin Nucleus Ribosome Endoplasmic-reticulum Golgi apparatus Vacuole Lysosome Chloroplast Plastid Chlorophyll Cytoskeleton Microtubule Microfilament Cilia Flagella	Chapter 7 Vocabulary Quizzes Chapter 7 A View of the Cell Assessment (CR) RST.8 Lab activity questions (CR) WHST.1 Lab activities analysis and conclusions (CR) WHST.2 Lab experiment procedure questions Performance Indicator 1.2-section assessment 7.1 Performance Indicator 1.3-section assessment 7.1

		molecules such as proteins and starches must initially be broken down (digested to amino acids and simple sugars respectively), in order to enter cells. Once nutrients enter a cell, the cell will use them as building blocks in the synthesis of compounds necessary for life. j. Inside the cell a variety of specialized structures, formed from many different molecules, carry out the transport of materials (cytoplasm), extraction of energy from nutrients (mitochondria), protein building (ribosomes), waste disposal (cell membrane), storage (vacuole), and information storage (nucleus). k. Receptor molecules play an important role in the interactions between cells. Two primary agents of cellular communication are hormones and chemicals produced by nerve cells. If nerve or hormone signals are blocked, cellular communication is disrupted and the organism's stability is affected. l. The structures present in some single-celled organisms act in a manner similar to the tissues and systems found in multi-cellular organisms, thus enabling them to perform all of the life processes needed to maintain homeostasis. **Performance Indicator 1.3** Explain how a one-celled organism is able to function despite lacking the levels of organization present in more complex organisms. Major Understandings: a. Explain how a one-celled organism is able to function despite lacking the levels of organization present in more complex organisms.	cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented. WHST.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the		in Petri Dishes Staying Young with Vitamin E		

			audience's knowledge of the topic. c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).				
Cellular transport and the Cell cycle -Osmosis and diffusion -Passive and active transport -Cell growth -Cell reproduction	19	Standard 4 Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. Key Idea 1: Living things are both similar to and different from each other and from nonliving things. **Performance indicator 1.2** a. Describe and explain the structures and functions of the human body at different organizational levels (e.g., systems, tissues, cells, organelles).	RST.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. RST.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 *grades 11–12 texts and topics*	How are the processes of cell transport important to cells? How are the stages of cell division related to the continuity of life? How do the	**Chapter 8 textbook** Chapter 8 Sections 8.1, 8.2, 8.3 textbook notes sheets Chapter 8 vocabulary sheets Vocabulary crossword puzzles **Unit 3 Chapter 8 Resources Book:**	Osmosis Isotonic solution Hypotonic-solution Hypertonic-solution Passive-transport Facilitated-diffusion Active transport Endocytosis Exocytosis Chromosome	RST.1 8.1, 8.2, 8.3 Section Assessments (CR) Lab activity questions (CR) RST.4 Chapter 8 Vocabulary Quizzes

-Cell cycle -Control of the cell cycle		b. Important levels of organization for structure and function include organelles, cells, tissues, organs, organ systems, and whole organisms. c. Humans are complex organisms. They require multiple systems for digestion, respiration, reproduction, circulation, excretion, movement, coordination, and immunity. The imbalance in homeostasis systems interact to perform the life functions. d. The components of the human body, from organ systems to cell organelles, interact to maintain a balanced internal environment. To successfully accomplish this, organisms possess a diversity of control mechanisms that detect deviations and make corrective actions. e. If there is a disruption in any human system, there may be a corresponding. f. The organs and systems of the body help to provide all the cells with their basic needs. The cells of the body are of different kinds and are grouped in ways that enhance how they function together. g. Cells have particular structures that perform specific jobs. These structures perform the actual work of the cell. Just as systems are coordinated and work together, cell parts must also be coordinated and work together. h. Each cell is covered by a membrane that performs a number of important functions for the cell. These include: separation from its outside environment, controlling which molecules enter and leave the cell, and recognition of chemical signals. The processes of diffusion	RST.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 WHST.1 Cite arguments focused on *discipline-specific content*. a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between	events of the cell cycle affect our health?	Minilabs, Biolab, Reinforcement/Study Guide, Concept mapping, problem-solving, section focus **Laboratory Manual Chapter 8 labs** **Serendiplbrynmar.edu/sci labs:** *Investigating Osmosis *Demonstration of Osmosis Using Chicken Eggs *Alcoholic Fermentation in Yeast **Lincoln-Way High School lab:** Movement Across the Membrane (Diffusion) **Biologycorner.com labs:** *Observing osmosis *Diffusion lab *Mitosis in an Onion Root *Onion cell mitosis *Cell cycle	Chromatin Cell cycle Interphase Mitosis Prophase Sister chromatid Centromere Centriole Spindle Metaphase Anaphase Telophase Cytokinesis Tissue Organ Organ system Cancer Gene	Chapter 8 Cellular Transport and the Cell Cycle Assessment (CR) RST.8 Lab activity questions (CR) WHST.1 Lab activities analysis and conclusions (CR) WHST.2 Lab experiment procedure questions Performance Indicator 1.2-section assessment 8.1

		and active transport are important in the movement of materials in and out of cells. i. Many organic and inorganic substances dissolved in cells allow necessary chemical reactions to take place in order to maintain life. Large organic food molecules such as proteins and starches must initially be broken down (digested to amino acids and simple sugars respectively), in order to enter cells. Once nutrients enter a cell, the cell will use them as building blocks in the synthesis of compounds necessary for life. j. Inside the cell a variety of specialized structures, formed from many different molecules, carry out the transport of materials (cytoplasm), extraction of energy from nutrients (mitochondria), protein building (ribosomes), waste disposal (cell membrane), storage (vacuole), and information storage (nucleus). k. Receptor molecules play an important role in the interactions between cells. Two primary agents of cellular communication are hormones and chemicals produced by nerve cells. If nerve or hormone signals are blocked, cellular communication is disrupted and the organism's stability is affected. :	claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented. WHST.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use varied transitions and sentence structures to link		*Mitosis Internet lesson **Ilovebacteria.com lab:** Egg Osmosis experiment **Biologyjunction.com lab:** Osmosis through the Cell Membrane of an Egg **Jenkintown High School lab:** Investigating Osmosis **Lesson Plans Inc. 2007 labs:** *Endocytosis Activity *Osmosis and Diffusion Lab **Cellsalive.com lab:** Mitosis Tutorial		

			the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).				

TOPIC	Days	Objectives (New York State Living Environment Core Curriculum)	ELA CCLS	Essential Questions	Resources	Vocabulary	Recommended Assessments
Energy in a Cell -ATP --Photosynthesis -Light	14	maintaining dynamic equilibrium. Major Understandings: Standard 4 Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. Key Idea 5 Organisms maintain a dynamic equilibrium that sustains life.	RST.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. RST.4 Determine the meaning of symbols, key terms, and other domain-specific words	Where do cells get energy? How is energy stored and released in a cell? What is the difference	**Chapter 9 textbook** Chapter 9 Sections 9.1, 9.2, 9.3 textbook notes sheets Chapter 9 vocabulary	ATP(adenosine-triphosphate) ADP(adenosine-diphosphate) Photosynthesis Light dependent-	RST.1 9.1, 9.2, 9.3 Section Assessments (CR) Lab activity questions (C RST.4 Chapter 9 Vocabulary Quizzes

dependent reactions -Light independent reactions -Cellular respiration -Fermentation		**Performance Indicator 5.1** Explain the basic biochemical processes in living organisms and their importance in maintaining dynamic equilibrium. a. The energy for life comes primarily from the Sun. Photosynthesis provides a vital connection between the Sun and the energy needs of living systems. b. Plant cells and some one-celled organisms contain chloroplasts, the site of photosynthesis. The process of photosynthesis uses solar energy to combine the inorganic molecules carbon dioxide and water into energy-rich organic compounds (e.g., glucose) and release oxygen to the environment. c. In all organisms, organic compounds can be used to assemble other molecules such as proteins, DNA, starch, and fats. The chemical energy stored in bonds can be used as a source of energy for life processes. d. In all organisms, the energy stored in organic molecules may be released during cellular respiration. This energy is temporarily stored in ATP molecules. In many organisms, the process of cellular respiration is concluded in mitochondria, in which ATP is produced more efficiently, oxygen is used, and carbon dioxide and water are released as wastes. e. The energy from ATP is used by the organism to obtain, transform, and transport materials, and to eliminate wastes.	and phrases as they are used in a specific scientific or technical context relevant to *grades 11–12 texts and topics* RST.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 WHST.1 Cite arguments focused on *discipline-specific content*. a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the	between cellular respiration and photosynthesis?	sheets Vocabulary crossword puzzles **Unit 3 Chapter 9 Resources Book:** Minilabs, Biolab, Reinforcement/Study Guide, Concept mapping, problem-solving, section focus **Laboratory Manual Chapter 9 lab** **Serendiplbrynmar.edu/sci labs:** *Alcoholic Fermentation in Yeast **Highered.mcgraw-hill.com lab:** Chapter 11:Plant Processes Virtual Lab-Which colors of the light	reactions Light-independent-reactions Pigment Chlorophyll Electron transport-chain NADP Photolysis Calvin cycle Cellular-respiration Anaerobic-respiration Aerobic-respiration Glycolysis Citric acid cycle Lactic acid-fermentation Alcoholic-fermentation	Chapter 9 Energy in a C Assessment (CR) RST.8 Lab activity questions (C WHST.1 Lab activities analysis a conclusions (CR) WHST.2 Lab experiment procedu questions (CR) Performance Indicator 5 section assessment 9.1,

		f. Biochemical processes, both breakdown and synthesis, are made possible by a large set of biological catalysts called enzymes. Enzymes can affect the rates of chemical change. The rate at which enzymes work can be influenced by internal environmental factors such as pH and temperature. g. Enzymes and other molecules, such as hormones, receptor molecules, and antibodies, have specific shapes that influence both how they function and how they interact with other molecules.	relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented. WHST.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use varied transitions and		spectrum are most important for plant growth? **Biology: Investigating Living Systems Lab Manual:** Lab 14 Factors Influencing the Rate of Yeast Respiration **Biologycorner.com labs:** *The Effects of Light Intensity and Wavelength on the Rate of Photosynthesis *Separation of Plant Pigments Using Chromatography **Biology Mr Hoyle lab:** Biology Quick Lab: Photosynthesis **Scribd.com lab:** Energy in the bonds of ATP **Schoolworkhel**		

			sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).		**per.net lab:** Cells and Energy Lab		