First Term

Unit 1—Scientific Inquiry

Living Environment Standards

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.

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.

Key Idea 3 The observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insights into natural phenomena.

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.

Key Idea 2 Organisms inherit genetic information in a variety of ways that result in continuity of structure and function between parents and offspring.

Key Idea 4 The continuity of life is sustained through reproduction and development.

Key Idea 5 Organisms maintain a dynamic equilibrium that sustains life.

Key Idea 7 Human decisions and activities have had a profound impact on the physical and living environment.

First Term

Chapter 1: Biology and You

Living Environment Standards

Standard 1

1.1a Scientific explanations are built by combining evidence that can be observed with what people already know about the world.

1.1b 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.

1.2.1 Devise ways of making observations to test proposed explanations.

1.2a Inquiry involves asking questions and locating, interpreting, and processing information from a variety of sources.

1.2b Inquiry involves making judgments about the reliability of the source and relevance of information.

1.2.4 Carry out a research plan for testing explanations, including selecting and developing techniques, acquiring and building apparatus, and recording observations as necessary.

1.3a Scientific explanations are accepted when they are consistent with experimental and observational evidence and when they lead to accurate predictions.

2.2a Development of a research plan involves researching background information and understanding the major concepts in the area being investigated. Recommendations for methodologies, use of technologies, proper equipment, and safety precautions should also be included.

2.3a Hypotheses are predictions based upon both research and observation.

2.3b Hypotheses are widely used in science for determining what data to collect and as a guide for interpreting the data.

3.1a Interpretation of data leads to development of additional hypotheses, the formulation of generalizations, or explanations of natural phenomena.

3.4a Hypotheses are valuable, even if they turn out not to be true, because they may lead to further investigation.

3.4b 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.

3.4c 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.

3.5a One assumption of science is that other individuals could arrive at the same explanation if they had access to similar evidence. Scientists make the results of their investigations public; they should describe the investigations in ways that enable others to repeat the investigations.

3.5b Scientists use peer review to evaluate the results of scientific investigations and the explanations proposed by other scientists. They analyze the experimental procedures, examine the evidence, identify faulty reasoning, point out statements that go beyond the evidence, and suggest alternative explanations for the same observations.

Standard 4

4.1a Reproduction and development are necessary for the continuation of any species.

5.3a Dynamic equilibrium results from detection of and response to stimuli. Organisms detect and respond to change in a variety of ways both at the cellular level and at the organismal level.

First Term

DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
1	Chapter 1 Opener, pp. 4-5	1. How can someone practice scientific thought? 2. What are universal laws in science? 3. How do ethics apply to science? 4. Why should someone who is not planning to become a scientist study science?	1.1.1b. 1.2.1 1.3.4b 1.3.4c 1.3.5b	Inquiry Lab: Make a Prediction (SE p. 5)	Reading Toolbox, p. 6, "Using Words" and "Using Language." Read pp. 6-9.
2	Chapter 1 Section 1, pp. 6-9			Quick Lab: Evaluate a Scientific Claim (SE p. 9)	Section 1 Review, p. 9, questions 1-4.
3	Chapter 1 Section 1 (cont.), pp. 6-9			Inquiry Lab: Storing Heat (CRF) [Lab Prep for Quick Lab: The pH of Common Substances]	Section 1 Review, p. 9, questions 5-7. Read pp. 10-13.
4	Chapter 1 Section 2, pp. 10-13	1. How do scientific investigations begin? 2. What are two types of experiments that scientists can use to test hypotheses? 3. What is the difference between a theory and a hypothesis?	1.1.1a 1.1.2a 1.1.2b 1.1.3a 1.2.3a 1.2.3b 1.3.1a 1.3.4a 1.3.5a	Quick Lab: The pH of Common Substances (SE p. 11)	Section Review, p. 13, questions 1-5. Read pp. 14-16.

* A Day equals a 45-minute period.

First Term

DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
5	Chapter 1 Section 3, pp. 14-16	1. Why do scientists use SI units for measurement? 2. What are some tools and techniques that scientists use in the laboratory? 3. What can you do to stay safe during an investigation?	1.2.2a 1.2.4	Quick Lab: Practice Staining Techniques (SE p. 15)	Reading Toolbox, p. 16 (refer to p. 6). Section Review, p. 16, questions 1-3.
6	Chapter 1 Section 3, pp. 14-16, (cont.)			Skills Practice Lab: SI Units (SE p. 20)	Section Review, p. 16, questions 4-7. Read pp. 17-19.
7	Chapter 1 Section 4, pp. 17-21	1. What are some of the branches of biology? 2. What are seven characteristics that all living things share?	4.4.1a. 4.5.3a	Quick Lab: Comparing Living and Nonliving Things (CRF)	Section Review, p. 19, questions 1-7.
8	End of Chapter Review and Assessment, pp. 22-25				Regents Exam Practice, p. 23, questions 1-8.
9	End of Chapter Review and Assessment (cont.)				Reading Toolbox, p. 28, “Using Words,” “Using Language.”
10	Reteaching/ Remediation				Per teacher assessment

First Term

Unit 2—Origin of Life

Living Environment Standards

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.

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.

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.

Key Idea 2 Organisms inherit genetic information in a variety of ways that result in continuity of structure and function between parents and offspring.

Key Idea 3 Individual organisms and species change over time.

Key Idea 4 The continuity of life is sustained through reproduction and development.

Key Idea 5 Organisms maintain a dynamic equilibrium that sustains life.

Key Idea 6 Plants and animals depend on each other and their physical environment.

Chapter 19: History of Life on Earth
Chapter 7: Cell Structure

Living Environment Standards

4.1.2f 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.

4.1.2g 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.

4.1.2i 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).

4.2.1f In all organisms, the coded instructions for specifying the characteristics of the organism are carried in DNA, a large molecule formed from subunits arranged in a sequence with bases of four kinds (represented by A, G, C, and T). The chemical and structural properties of DNA are the basis for how the genetic information that underlies heredity is both encoded in genes (as a string of molecular 'bases') and replicated by means of a template.

4.3.1j Billions of years ago, life on Earth is thought by many scientists to have begun as simple, single-celled organisms. About a billion years ago, increasingly complex multicellular organisms began to evolve.

First Term

DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
11	Chapter 19 Opener and Section 1, pp. 444-49	1. What did the Miller-Urey experiment show about the formation of the basic molecules of life? 2. What are two theories that propose where the building blocks of life originated on early Earth? 3. How could molecules have become packaged into cells that contain heritable cellular instructions?	4.3.1j	Inquiry Lab, p. 445, "Logical Order Reading Toolbox, p. 446	Read Section 1, "How Did Life Begin?" pp. 447-449.
12	Chapter 19 Opener and Section 1, pp. 444-49 (cont.)			Skills Practice Lab: SI Units (SE p. 20)	Section 1 Review, p. 449. Read Chapter 7, Section 1, pp. 151-154.
13	Chapter 7 Section 1, pp. 151-54	1. How were cells discovered? 2. What defines cell shape and size? 3. What enables eukaryotes to perform more specialized functions than prokaryotes do?	4.1.2f 4.1.2g 4.1.2i 4.2.1f 4.3.1j	Math Skills, p. 153	Section 1 Review, p. 155. Read Chapter 4, Section 1, pp. 79-84.

* A Day equals a 45-minute period.

Unit 3—Ecology

Living Environment Standards

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.

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.

Chapter 4: Ecosystems
Chapter 5: Populations and Communities
Chapter 6: The Environmentalist

Living Environment Standards

4.1.1a 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.

4.1.1b 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.

4.1.1c In all environments, organisms compete for vital resources. The linked and changing interactions of populations and the environment compose the total ecosystem.

4.1.1d 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.

4.1.1e Ecosystems, like many other complex systems, tend to show cyclic changes around a state of approximate equilibrium.

4.1.1f 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.

4.5.1a The energy for life comes primarily from the Sun. Photosynthesis provides a vital connection between the Sun and the energy needs of living systems.

4.6.1a 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.

4.6.1b 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.

4.6.1c 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.

First Term

4.6.1d	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 ecosystems to recycle the residue of dead organisms through the activities of bacteria and fungi.
4.6.1e	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).
4.6.1f	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.
4.6.1g	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.
4.6.2a	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.
4.6.2b	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.
4.6.3a	The interrelationships and interdependencies of organisms affect the development of stable ecosystems.
4.6.3b	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 or thousands of years.
4.6.3c	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 longterm stability.
4.7.1a	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.
4.7.1b	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.
4.7.1c	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 current global stability, and if not addressed, ecosystems maybe irreversibly affected.
4.7.2a	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.
4.7.2b	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.
4.7.2c	Industrialization brings an 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.
4.7.3a	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.
4.7.3b	The decisions of one generation both provide and limit the range of possibilities open to the next generation.

First Term

DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
14	Chapter 4 Opener and Section 1, pp. 76-85	1. What are the parts of an ecosystem? 2. How does an ecosystem respond to change? 3. What two key factors of climate determine a biome? 4. What are the three major groups of terrestrial biomes? 5. What are the four kinds of aquatic ecosystems?	4.1.1b 4.1.1e 4.6.1e 4.6.3b 4.6.3c	Inquiry Lab, p. 77, "Water Cycle" Reading Toolbox, p. 78	Section 1 Review, p. 84, questions 1-5. Read p. 85, "Maintained by Fire."
15	Chapter 4 Section 1 (cont.)			QuickLab, p. 80, Biodiversity Evaluation	Section 1 Review, p. 84, questions 6, 7. Read Chapter 4, Section 2, pp. 86-89.
16	Chapter 4 Section 2, pp. 86-89	1. How does energy flow through an ecosystem? 2. What happens to energy as it is transferred between trophic levels in a community?	4.1.1a 4.5.1a 4.6.1a 4.6.1b 4.6.1c	Reading Toolbox, Word Problem, p. 89	Section 2 Review, p. 89, questions 1-5. Read Chapter 4, Section 3, pp. 90-93.
17	Chapter 4 Section 3, pp. 90-96	1. What is the water cycle? 2. Why are plants and animals important for carbon and oxygen in an ecosystem? 3. Why must nitrogen cycle through an ecosystem? 4. Why must phosphorus cycle through an ecosystem?	4.6.1b 4.6.1c 4.7.1b	QuickLab, p. 93, The Carbon Cycle	Section 3 Review, p. 93, questions 1-5, 8.

* A Day equals a 45-minute period.

First Term

DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
18	Chapter 4 End of Chapter Review and Assessment, pp. 97-99			Chapter 4 Lab, "Ecosystem Change," pp. 94-95 Interactive Super Summary, http://go.hrw.com, keyword HX8ECOS	Regents Exam Practice, pp. 98-99, questions 1-7.
19	Chapter 4 End of Chapter Review and Assessment (cont.)				Regents Exam Practice, pp. 98-99, questions 8-13.
20	Chapter 4 Reteaching/ Remediation				Per teacher Assessment
21	Chapter 5 Opener and Section 1, pp. 100-08	1. Why is it important to study populations? 2. What is the difference between exponential growth and logistic growth? 3. What factors affect population size? 4. How have science and technology affected human population growth?	4.1.1c 4.1.1d 4.6.1d 4.6.1e 4.6.1f	Inquiry Lab, p. 101, "Population Size" Reading Toolbox, p. 102	Read Section 1, pp. 103-107.
22	Chapter 5 Section 1 (cont.)			QuickLab, p. 105, "Population Growth"	Section 1 Review, p. 107, questions 1-7. Read Chapter 5, Section 2, pp. 109-111.

First Term

DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
23	Chapter 5 Section 2, pp. 109-11	1. How do predator-prey interactions influence both predators and prey? 2. What are two other types of interaction in a community?	4.6.1g 4.6.2a	QuickLab, p. 110, "The Effects of Herbivores on a Plant Species."	Section 2 Review, p. 111, questions 1-5. Read Chapter 5, Section 3, pp. 112-115.
24	Chapter 5 Section 3, pp. 112-18	1. How does a species' niche affect other organisms? 2. How does competition for resources affect species in a community? 3. What factors influence the resiliency of an ecosystem?	4.1.1c 4.1.1d 4.1.1f 4.6.2a 4.6.3a	QuickLab, p. 113, "Changes in a Realized Niche"	Section 3 Review, p. 115, questions 1-5, 7.
25	Chapter 5 End of Chapter Review and Assessment, pp. 119-21			Chapter 5 Lab, pp. 116-117, "Yeast Population Growth"	Regents Exam Practice, pp. 119-120, questions 1-7.
26	Chapter 5 End of Chapter Review and Assessment (cont.)				Regents Exam Practice, p. 120, questions 8-12.
27	Chapter 5 Reteaching/ Remediation				Per Teacher Assessment

First Term

DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
28	Chapter 6 Opener and Section 1, pp. 122-26	1. How are humans and the environment connected? 2. What is the difference between renewable resources and nonrenewable resources? 3. How can the state of the environment affect a person's health and quality of life?	4.7.1a 4.7.1b 4.7.1c 4.7.2a 4.7.2b	Inquiry Lab, p. 123, "The Greenhouse Effect" Reading Toolbox, p. 124	Read Chapter 6, Section 1, pp. 125-127.
29	Chapter 6 Section 1 (cont.) Section 2, pp. 128-33	1. What are the effects of air pollution? 2. How might burning fossil fuels lead to climate change? 3. What are some sources of water pollution? 4. Why is soil erosion a problem? 5. How does ecosystem disruption affect humans?	4.6.2b 4.7.1c 4.7.2a 4.7.2b 4.7.2c	QuickLab, p. 127, "Contaminated Water"	Section 1 Review, p. 127, questions 1-6. Read Chapter 6, Section 2, pp. 128-133.
30	Chapter 6 Section 2 (cont.)			QuickLab, p. 131, "Soil Erosion"	Section 2 Review, p. 133, questions 1-7. Read Chapter 6, Section 3, pp. 134-138.

First Term

DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
31	Chapter 6 Section 3, pp. 134-42	1. How do conservation and restoration solve environmental issues? 2. What are three ways that people can reduce the use of environmental resources? 3. How can research and technology affect the environment? 4. How do education and advocacy play a part in preserving the environment? 5. Why is it important for societies to consider environmental impact when planning for the future?	4.7.3a 4.7.3b	QuickLab, p. 135, "Recycled Paper"	Section 3 Review, p. 138, questions 1-7.
32	Chapter 6 End of Chapter Review and Assessment, pp. 143-45			Chapter 6 Lab, pp. 140-141, "Effects of Acid Rain on Seeds"	Regents Exam Practice, p. 143, questions 1-10.
33	Chapter 6 End of Chapter Review and Assessment, (cont.)			Super Summary, http://go.hrw.com, keyword HX8ENVS	Regents Exam Practice, p. 144, questions 11-15.
34	Chapter 6 End of Chapter Review and Assessment (cont.)				Per Teacher Assessment
35	Reteaching/ Remediation				Per teacher assessment

Unit 4—Organization and Patterns

Living Environment Standards

Standard 1: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions.

Key Idea 3 The observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insights into natural phenomena.

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.

Key Idea 2 Organisms inherit genetic information in a variety of ways that result in continuity of structure and function between parents and offspring.

Key Idea 3 Individual organisms and species change over time.

Key Idea 4 The continuity of life is sustained through reproduction and development.

Key Idea 5 Organisms maintain a dynamic equilibrium that sustains life.

Chapter 7: Cell Structure
Chapter 8: Cells and Their Environment
Chapter 9: Photosynthesis and Cellular Respiration
Chapter 10: Cell Growth and Division

Living Environment Standards

4.1.2a Important levels of organization for structure and function include organelles, cells, tissues, organs, organ systems, and whole organisms.

4.1.2c 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.

4.1.2e 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.

4.1.2f 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.

4.1.2g 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.

4.1.2h 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.

First Term

4.1.2i	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).
4.1.2j	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.
4.2.1f	In all organisms, the coded instructions for specifying the characteristics of the organism are carried in DNA, a large molecule formed from subunits arranged in a sequence with bases of four kinds (represented by A, G, C, and T). The chemical and structural properties of DNA are the basis for how the genetic information that underlies heredity is both encoded in genes (as a string of molecular 'bases') and replicated by means of a template.
4.2.1k	The many body cells in an individual can be very different from one another, even though they are all descended from a single cell and thus have essentially identical genetic instructions. This is because different parts of these instructions are used in different types of cells, and are influenced by the cell's environment and past history.
4.3.1j	Billions of years ago, life on Earth is thought by many scientists to have begun as simple, single-celled organisms. About a billion years ago, increasingly complex multicellular organisms began to evolve.
4.5.1a	The energy for life comes primarily from the Sun. Photosynthesis provides a vital connection between the Sun and the energy needs of living systems.
4.5.1b	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.
4.5.1c	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.
4.5.1d	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.
4.5.1e	The energy from ATP is used by the organism to obtain, transform, and transport materials, and to eliminate wastes.
4.5.1f	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.
4.5.1g	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.
4.5.2i	Gene mutations in a cell can result in uncontrolled cell division, called cancer. Exposure of cells to certain chemicals and radiation increases mutations and thus increases the chance of cancer.
4.5.3a	Dynamic equilibrium results from detection of and response to stimuli. Organisms detect and respond to change in a variety of ways both at the cellular level and at the organismal level.
4.6.1c	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.

First Term

DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
36	Chapter 7 Review from Unit 2, Section 1, and Section 2, pp. 154-61	1. How were cells discovered? 2. What defines cell shape and size? 3. What enables eukaryotes to perform more specialized functions than prokaryotes do? 4. What does the cytoskeleton do? 5. How does DNA direct activity in the cytoplasm? 6. What organelles participate in protein production? 7. What is the role of vesicles in cells? 8. How do cells get energy?	4.1.2f 4.1.2g 4.1.2i 4.2.1f 4.3.1j 4.5.1b 4.5.3a	Reading Toolbox, p. 150, Using Words, Using Language	Read Chapter 7 Section 2, pp. 156-161.
37	Chapter 7 Section 2, pp. 156-61 (cont.)			QuickLab, p. 160, Cell Parts Model	Section Review, p. 161, questions 1-6. Read Chapter 7, Section 3, pp. 162-166.
38	Chapter 7 Section 3, pp. 162-68	1. What makes cells and organisms different? 2. How are cells organized in a complex multicellular organism? 3. What makes an organism truly multicellular?	4.1.2a 4.1.2e 4.2.1k	QuickLab, p. 165, "Colonies on the Move"	Section Review, p. 162, questions 1-5.
39	Chapter 7 End of Chapter Review and Assessment, pp. 169-71			Chapter 7 Lab, p. 167, "Plant Cell Observation"	Regents Exam Practice, pp. 169-170, questions 1-14.

* A Day equals a 45-minute period.

First Term

DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
40	Chapter 7 End of Chapter Review and Assessment (cont.)				Per teacher assessment
41	Chapter 8 Opener and Section 1, pp. 172-77	1. How does the cell membrane help a cell maintain homeostasis? 2. How does the cell membrane restrict the exchange of substances? 3. What are some functions of membrane proteins?	4.1.2c 4.1.2g 4.5.3a	Inquiry Lab, p. 173, Salty Cells" Reading Toolbox, p. 174	Read Chapter 8, Section 1, pp. 175-177. Reading Toolbox, p. 177, "Four-Corner Fold."
42	Chapter 8 Section 1 (cont.) Section 2, pp. 178-83	1. What determines the direction in which passive transport occurs? 2. Why is osmosis important? 3. How do substances move against their concentration gradients?	4.1.2g 4.1.2i 4.5.1e	Demonstration, p. 176 (Teachers Edition) "Selectively Permeable Membrane"	Section 1 Review, p. 177, questions 1-5. Read Chapter 8, Section 2, pp. 178-183.
43	Chapter 8 Section 2 (cont.)			QuickLab, p. 181, "Osmosis"	Section 2 Review, p. 183, questions 1-5. Read Chapter 8, Section 3, pp. 184-186.
44	Chapter 8 Section 2 (cont.) Section 3, pp. 184-90	1. How do cells use signal molecules? 2. How do cells receive signals? 3. How do cells respond to signaling?	4.1.2g 4.1.2j 4.5.1g	QuickLab, p. 181, "Osmosis" (conclusion)	Read p. 187, "Heady Effects" (Do project).
45	Chapter 8 Section 3 (cont.)			QuickLab, p. 185, "Sensitive Plants"	Section 3 Review, p. 186, questions 1-5.

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DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
46	Chapter 8 End of Chapter Review and Assessment, pp. 191-93			Chapter 8 Lab, pp. 188-189 "Cell Size and Diffusion"	Regents Exam Practice, pp. 191-193, questions 1-15.
47	Chapter 8 End of Chapter Review and Assessment (cont.)				Per teacher assessment
48	Chapter 9 Opener and Section 1, pp. 194-201	1. What type of energy is used in cells, and what is the ultimate source of this energy? 2. How is an organism's metabolism related to the carbon cycle? 3. How is energy released in a cell?	4.1.2h 4.5.1a 4.5.1c 4.5.1e 4.6.1c	Inquiry Lab, p. 195 "Stored Energy"	Reading Toolbox, p. 196, "Using Words." Read Chapter 9, Section 1, pp. 197-201.
49	Chapter 9 Section 1 (cont.) Section 2, pp. 202-07	1. What is the role of pigments in photosynthesis? 2. What are the roles of the electron transport chains? 3. How do plants make sugars and store extra unused energy? 4. What are three environmental factors that affect photosynthesis?	4.1.2f 4.1.2i 4.5.1b 4.5.1f	QuickLab, p. 198, "Product of Photosynthesis"	Section 1 Review, p. 201, questions 1-6. Read Chapter 9, Section 2, pp. 202-207.
50	Chapter 9 Section 2 (cont.)			QuickLab, p. 205, "Photosynthetic Rate"	Chapter 2 Review, p. 207, questions 1-6. Read Chapter 9, Section 3, pp. 208-213.

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DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
51	Chapter 9 Section 3, pp. 208-16	1. How does glycolysis produce ATP? 2. How is ATP produced in aerobic respiration? 3. Why is fermentation important?	4.1.2i 4.5.1d	Teaching Key Ideas, p. 213, "Fermentation Demonstration"	Section 3 Review, p. 213, questions 1-4.
52	Chapter 9 End of Chapter Review and Assessment, pp. 217-19			Chapter 9 Lab, p. 215, "Cellular Respiration"	Regents Exam Practice, pp. 217-219, questions 1-17.
53	Chapter 9 End of Chapter Review and Assessment, (cont.)				Read Chapter 10, Section 1, pp. 223-226.
54	Chapter 10 Section 1 and Section 2, pp. 223-32	1. Why do cells divide? 2. How is DNA packaged into the nucleus? 3. How do cells prepare for division? 4. What are the phases of the eukaryotic cell cycle? 5. What are the four stages of mitosis? 6. How does cytokinesis occur?	4.1.2c 4.5.2i	Inquiry Lab, p. 221, "Whitefish Cells" QuickLab, p. 224, "Chromosome Package"	Section 1 Review, p. 226, questions 1-6. Read Chapter 10, Section 2, pp. 227-232.
55	Chapter 10 Section 2, pp. 223-32 (cont.)			QuickLab, p. 229, "Number of Cells Resulting from Mitosis"	Section 2 Review, p. 232, questions 1-6.

Unit 5—Homeostasis and Immunity

Living Environment Standards

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.

Key Idea 2 Organisms inherit genetic information in a variety of ways that result in continuity of structure and function between parents and offspring.

Key Idea 4 The continuity of life is sustained through reproduction and development.

Key Idea 5 Organisms maintain a dynamic equilibrium that sustains life.

Chapter 20: Homeostasis and Human Body Systems
Chapter 21: Homeostasis and Human Diseases
Chapter 22: The Body's Defenses

Living Environment Standards

4.1.2a Important levels of organization for structure and function include organelles, cells, tissues, organs, organ systems, and whole organisms.

4.1.2b Humans are complex organisms. They require multiple systems for digestion, respiration, reproduction, circulation, excretion, movement, coordination, and immunity. The systems interact to perform the life functions.

4.1.2c 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.

4.1.2d If there is a disruption in any human system, there may be a corresponding imbalance in homeostasis.

4.1.2e 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.

4.1.3a The structures present in some single-celled organisms act in a manner similar to the tissues and systems found I multicellular organisms, thus enabling them to perform all of the life processes needed to maintain homeostasis.

4.2.2e Knowledge of genetics is making possible new fields of health care; for example, finding genes which may have mutations that can cause disease will aid in the development of preventive measures to fight disease. Substances, such as hormones and enzymes, from genetically engineered organisms may reduce the cost and side effects of replacing missing body chemicals.

4.5.1g 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.

4.5.2a Homeostasis in an organism is constantly threatened. Failure to respond effectively can result in disease or death.

4.5.2b Viruses, bacteria, fungi, and other parasites may infect plants and animals and interfere with normal life functions.

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4.5.2c	The immune system protects against antigens associated with pathogenic organisms or foreign substances and some cancer cells.
4.5.2d	Some white blood cells engulf invaders. Others produce antibodies that attack them or mark them for killing. Some specialized white blood cells will remain, able to fight off subsequent invaders of the same kind.
4.5.2e	Vaccinations use weakened microbes (or parts of them) to stimulate the immune system to react. This reaction prepares the body to fight subsequent invasions by the same microbes.
4.5.2f	Some viral diseases, such as AIDS, damage the immune system, leaving the body unable to deal with multiple infectious agents and cancerous cells.
4.5.2g	Some allergic reactions are caused by the body's immune responses to usually harmless environmental substances. Sometimes the immune system may attack some of the body's own cells or transplanted organs.
4.5.2h	Disease may also be caused by inheritance, toxic substances, poor nutrition, organ malfunction, and some personal behavior. Some effects show up right away; others may not show up for many years.
4.5.2j	Biological research generates knowledge used to design ways of diagnosing, preventing, treating, controlling, or curing diseases of plants and animals.
4.5.3a	Dynamic equilibrium results from detection of and response to stimuli. Organisms detect and respond to change in a variety of ways both at the cellular level and at the organismal level.
4.5.3b	Feedback mechanisms have evolved that maintain homeostasis. Examples include the changes in heart rate or respiratory rate in response to increased activity in muscle cells, the maintenance of blood sugar levels by insulin from the pancreas, and the changes in openings in the leaves of plants by guard cells to regulate water loss and gas exchange.

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DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
56	Chapter 20 Opener and Section 1, pp. 466-75	1. How does a change in the external environment affect an organism? 2. How does an organism respond to changes, and what happens if the organism fails to respond to the changes? 3. What organ systems do humans need in order to survive?	4.1.2c 4.1.2d 4.1.2e 4.1.3a 4.5.2a 4.5.3a	Inquiry Lab, p. 469, "Blood Pressure and Homeostasis"	Read Chapter 20, Section 1, pp. 471-475.
57	Chapter 20 Section 1 (cont.)			QuickLab, p. 475, "Investigation of Homeostasis"	Section 1 Review, questions 1-5. Read Chapter 20, Section 2.
58	Chapter 20 Section 2, pp. 476-83	1. How do the skeletal and muscular systems help the body maintain homeostasis? 2. How does the integumentary system help the body maintain homeostasis? 3. How do the nervous and endocrine systems help the body maintain homeostasis? 4. How do the digestive and excretory systems help the body maintain homeostasis? 5. How do the circulatory and respiratory systems help the body maintain homeostasis?	4.1.2a 4.1.2b 4.1.2c	QuickLab, p. 481, "Filtration Rate in the Kidneys"	Section 2 Review, questions 1-6. Read Chapter 20, Section 3, pp. 484-488.

* A Day equals a 45-minute period.

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DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
59	Chapter 20 Section 2 (cont.) Section 3 pp. 484-92	1. How do feedback mechanisms help maintain homeostasis? 2. How does a feedback mechanism control a person's breathing rate? 3. How does a feedback mechanism maintain the concentration of glucose in the bloodstream?	4.1.2c 4.1.2e 4.5.3b	Demonstration, p. 482 (Teachers Edition) "Blood Pressure"	Section 3 Review, questions 1-4.
60	Chapter 20 Section 3, (cont.)			QuickLab, p. 487, "Blood pH and Homeostasis"	Read p. 489, "Diabetes" and do the research project.
61	Chapter 20 End of Chapter Review and Assessment, pp. 493-95			Chapter 20 Lab, p. 490, "Epinephrine and Heart Rate"	Chapter 20 Regents Exam Practice, pp. 493-494, questions 1-12.
62	Chapter 20 End of Chapter Review and Assessment, (cont.)			Super Summary, http://go.hrw.com, keyword HX8BODS	Practice, pp. 494-495, questions 13-25.
63	Chapter 20 End of Chapter Review and Assessment, (cont.)				Per teacher assessment

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DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
59	Chapter 20 Section 2 (cont.) Section 3, pp. 484-92	1. How do feedback mechanisms help maintain homeostasis? 2. How does a feedback mechanism control a person's breathing rate? 3. How does a feedback mechanism maintain the concentration of glucose in the bloodstream?	4.1.2c 4.1.2e 4.5.3b	Demonstration, p. 482 (Teachers Edition) "Blood Pressure"	Section 3 Review, questions 1-4.
60	Chapter 20 Section 3, (cont.)			QuickLab, p. 487, "Blood pH and Homeostasis"	Read p. 489, "Diabetes" and do the research project.
61	Chapter 20 End of Chapter Review and Assessment, pp. 493-95			Chapter 20 Lab, p. 490, "Epinephrine and Heart Rate"	Chapter 20 Regents Exam Practice, pp. 493-494, questions 1-12.
62	Chapter 20 End of Chapter Review and Assessment, (cont.)			Super Summary, http://go.hrw.com, keyword HX8BODS	Practice, pp. 494-495, questions 13-25.
63	Chapter 20 End of Chapter Review and Assessment, (cont.)				Per teacher assessment

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DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
64	Chapter 21 Opener and Section 1, pp. 496-501	1. What causes disease? 2. How are pathogens spread? 3. What can you do to help avoid diseases?	4.1.2d 4.5.2a 4.5.2b 4.5.2h 4.5.2j	Inquiry Lab, p. 497, "Homeostasis and Human Diseases"	Reading Toolbox, p. 498, "Using Words" and "Using Language." Read Chapter 21, Section 1, pp. 499-501.
65	Chapter 21 Section 1 (cont.) Section 2, pp. 502-09	1. How do pathogenic bacteria cause disease? 2. Why do viruses cause damage to their hosts? 3. How are pathogenic fungi similar to pathogenic bacteria? 4. How do parasitic worms cause disease? 5. What diseases are caused by protists?	4.5.2b	QuickLab, p. 504, "Emergence of Bird Flu"	Section 1 Review, p. 501, questions 1-6. Read Chapter 21, Section 2, pp. 502-508.
66	Chapter 21 Section 2 (cont.)			Math Skills p. 506 (Teachers Edition)	Section 2 Review, p. 508, questions 1-7. Read Chapter 21, Section 3, pp. 510-515.
67	Chapter 21 Section 3, pp. 510-18	1. How does personal behavior affect a person's health? 2. How are genetic disorders transmitted? 3. Why do some organs malfunction? 4. What causes a nutritional disease? 5. Why are toxic substances dangerous?	4.2.2e 4.5.2a 4.5.2h	QuickLab, p. 514, "The Nutrition Facts Label"	Section 3 Review, p. 515, questions 1-7.

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DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
68	Chapter 21 End of Chapter Review and Assessment, pp. 519-21			Chapter 21 Lab, p. 516, "Tobacco Mosaic Virus"	Chapter 21 Regents Exam Practice, p. 519-520, questions 1-9.
69	Chapter 21 End of Chapter Review and Assessment (cont.)				Chapter 21 Regents Exam Practice, p. 520-521, questions 10-15.
70	Chapter 21 End of Chapter Review and Assessment (cont.)				Per Teacher Assessment
71	Chapter 22 Opener and Section 1, pp. 522-28	1. What physical barriers protect the human body? 2. What are three general defense mechanisms that the body uses to fight pathogens? 3. How does the body respond to pathogens that have infected a cell?	4.1.2b 4.5.2c 4.5.2d	Inquiry Lab, p. 523, "Barrier Breaking"	Reading Toolbox, p. 524, "Using Words and "Using Language." Read Chapter 22, Section 1, pp. 525-528.
72	Chapter 22 Section 1 (cont.)			QuickLab, p. 528, "Antigen Binding"	Section 1 Review, p. 528, questions 1-5. Read Chapter 22, Section 2, pp. 530-533.

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DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
73	Chapter 22 Section 2, pp. 529-33	1. How is the specific immune response activated? 2. How does the body eliminate intracellular pathogens? 3. How does the body eliminate extracellular pathogens? 4. How does the immune system protect the body from repeated infection by the same pathogen?	4.1.2b 4.5.1g 4.5.2c 4.5.2d 4.5.2e	QuickLab, p. 533, "The Eradication of Polio"	Section 2 Review, p. 533, questions 1-5.
74	Chapter 22 Section 2 (cont.)			Reading Toolbox, p. 530, Pattern Puzzles	Read Chapter 22, Section 3, pp. 534-539.
75	Chapter 22 Section 3 pp. 534-42	1. What causes allergic reactions? 2. What are autoimmune diseases? 3. What happens when your immune system is compromised?	4.5.2f 4.5.2g	QuckLab, p. 535, "Constricted Airways"	Section 3 Review, p. 539, questions 1-5.
76	Chapter 22 End of Chapter Review and Assessment, pp. 543-45			Chapter 22 Lab, p. 540 "Disease Transmission Model"	P. 536, "Allergies and Culture."
77	Chapter 22 End of Chapter Review and Assessment (cont.)			Super Summary, http://go.hrw.com, keyword HB8IMNS	Chapter 22 Regents Exam Practice, pp. 543-544, questions 1-13.

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DAY*	CHAPTER/ SECTION	KEY IDEAS	NYS CORE CURRICULUM	HANDS ON	HOMEWORK SUGGESTIONS
78	Chapter 22 End of Chapter Review and Assessment (cont.)				Chapter 22 Regents Exam Practice, pp. 544-545, questions 14-18.
79	Chapter 22 End of Chapter Review and Assessment (cont.)				Per teacher assessment
80	Reteaching/ Remediation				Per teacher assessment