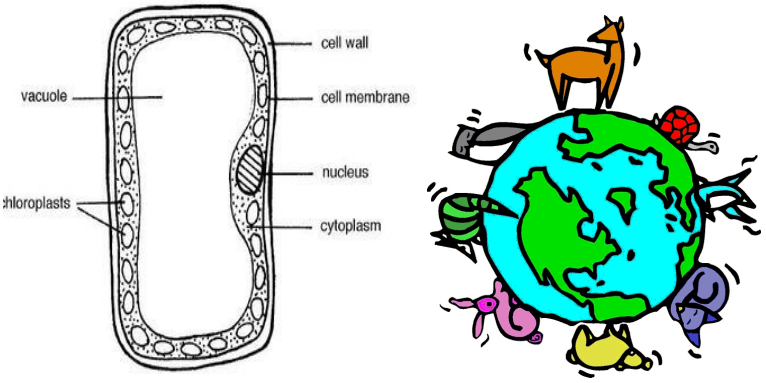
8th Grade

Science Curriculum



Living Environment

Grade 8 Curriculum Description

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.

The grade 8 curriculum comprises topics in the Living Environment as outlined in the following pages. Included are suggested labs, demos, Tier 2 and Tier 3 vocabulary words, literacy and group activities.
It should be understood that the scientific method, lab safety and knowledge of lab equipment must be integrated in the unit where appropriate.

The suggested important tier 2 vocabulary listed in the outline includes words that are not associated with content in this unit but are necessary for student learning. These words meet the common core literacy standards for building tier 2 and tier 3 vocabulary. Even though the teacher should be familiar with the content tier 3 vocabulary that would need to be taught, they are included in the outline also for each unit.

Below is an estimate of the appropriate time allotment for each unit.

Cells and Cellular Organization - 8 weeks

Comparison of Organisms – 3 weeks

Human Body Systems – 4 weeks

Genetics and Heredity– 3 weeks

Reproduction and Development – 5 weeks

Evolution and Species Variation – 4 weeks

Dynamic Equilibrium and Energy Use – 6 weeks

Ecology and Human Impacts – 4 weeks

Cells and Cellular Organization

STANDARD 4: The Living Environment

Key Idea 1:
Living things are both similar to and different from each other and from nonliving things.

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

Tier 2 Vocabulary

Composed	Structure	Functions	Microscopic	Organisms
Organized	Specialized	sustain	divide	characteristics
Internal	External	classification		

Tier 3 Vocabulary

Cells	Nutrients	Cell membrane	Genetic material	Cytoplasm
Cell wall	Chloroplasts	Nucleus	Multicellular	Tissues
Organs	Organ systems	energy		

Performance Indicators
1.1 Compare and contrast the parts of plants, animals, and one-celled organisms.

5.1 Compare the way a variety of living specimens carry out basic life functions and maintain dynamic equilibrium.

Process Skills
1. manipulate a compound microscope to view microscopic objects
2. determine the size of a microscopic object, using a compound microscope
3. prepare a wet mount slide
4. use appropriate staining techniques

Major Understandings:
1.1a Living things are composed of cells. Cells provide structure and carry on major functions to sustain life. Cells are usually microscopic in size.

1.1b The way in which cells function is similar in all living things. Cells grow and divide, producing more cells. Cells take in nutrients, which they use to provide energy for the work that cells do and to make the materials that a cell or an organism needs.

1.1c Most cells have cell membranes, genetic material, and cytoplasm. Some cells have a cell wall and/or chloroplasts. Many cells have a nucleus.

1.1d Some organisms are single cells; others, including humans, are multicellular.

1.1e Cells are organized for more effective functioning in multicellular organisms. Levels of organization for structure and function of a multicellular organism include cells, tissues, organs, and organ systems.

5.1c All organisms require energy to survive. The amount of energy needed and the method for obtaining this energy vary among cells. Some cells use oxygen to release the energy stored in food.

Labs:

1. Develop microscope skills using prepared slide of plant and animal cells.

2. Prepare wet mount slides of living protists and plant cells using proper staining techniques.

3. Compare the differences between plant and animal cells using 3-D models.

4. Research projects: Cell Brochures and Cell Organelle Analogies (factory, mall, school)

5. Cell Organelles and their Functions
   http://nylearns.org/module/content/search/item/4322/viewdetail.ashx#sthash.EljmXLNs.dpbs

6. Cellsalive.com

Expanded Process Skills:

Key Idea 1:
Information technology is used to retrieve, process, and communicate information as a tool to enhance learning.
1.1 Use a range of equipment and software to integrate several forms of information in order to create good-quality audio, video, graphic, and text-based presentations.

1.3 Systematically obtain accurate and relevant information pertaining to a particular topic from a range of sources, including local and national media, libraries, museums, governmental agencies, industries, and individuals.

Key Idea 2:
Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.
2.1 Select an appropriate model to begin the search for answers or solutions to a question or problem.
2.2 Use models to study processes that cannot be studied directly (e.g., when the real process is too slow, too fast, or too dangerous for direct observation).

3.2 Use powers of ten notation to represent very small and very large numbers.

CCLS – Literacy

CCSS.ELA –LITERACY.RST.6-8.9
Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

CCSS.ELA-LITERACY.WST.6-8.7
Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration

Comparison of Organisms

Standard 4 – The Living Environment

Key Idea 1:
Living things are both similar to and different from each other and from nonliving things.

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

Tier 2 Vocabulary

Compare	Contrast	Organisms	Variety	Organized
Specialized	Classified	Internal	External	characteristics
Internal	External	Contribute	Maintain	survive
Obtaining	Required	Survival	Sense	respond
balance				

Tier 3 Vocabulary

Roots	Stems	Leaves	Reproductive structures	Tissues
Cellular	Multicellular	classification	Kingdom	species
Regulation	Environment	Hormonal	Feedback	

Performance Indicators

1.2 Compare and contrast the parts of plants, animals, and one-celled organisms.

5.1 Compare the way a variety of living specimens carry out basic life functions and maintain dynamic equilibrium.

Process Skills

1. classify living things according to a student-generated scheme and an established scheme

Major Understandings:

1.1f Many plants have roots, stems, leaves, and reproductive structures. These organized groups of tissues are responsible for a plant's life activities.

1.1g Multicellular animals often have similar organs and specialized systems for carrying out major life activities.

1.1h Living things are classified by shared characteristics on the cellular and organism level. In classifying organisms, biologists consider details of internal and external structures. Biological classification systems are arranged from general (kingdom) to specific (species).

5.1a Animals and plants have a great variety of body plans and internal structures that contribute to their ability to maintain a balanced condition.

5.1b An organism's overall body plan and its environment determine the way that the organism carries out the life processes.

5.1f Regulation of an organism's internal environment involves sensing the internal environment and changing physiological activities to keep conditions within the range required for survival. Regulation includes a variety of nervous and hormonal feedback systems.

5.1g The survival of an organism depends on its ability to sense and respond to its external environment.

Labs:

1. Develop and use Dichotomous Keys for organism classification.

2. Analyze the reproductive structures of plants.

Expanded Process Skills:

Key Idea 2: Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.
2.1 Select an appropriate model to begin the search for answers or solutions to a question or problem. 2.2 Use models to study processes that cannot be studied directly (e.g., when the real process is too slow, too fast, or too dangerous for direct observation).
2.3 Demonstrate the effectiveness of different models to represent the same thing and the same model to represent different things.

CCLS-LITERACY

CCLS-ELA.LITERACY RST.6-8.7
Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

Human Body Systems

Standard 4 – The Living Environment

Key Idea 1:
Living things are both similar to and different from each other and from nonliving things.

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

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

Tier 2 Vocabulary

Composed	Interact	Provides	Variety	Maintain
Balanced	Release	Disposal	Coordinated	Responds
Regulate	Infection	Specialized	Absorbed	transported
Dissolved	interaction	control	abnormal	contraction
development	Interfere			

Tier 3 Vocabulary

Organs	Tissues	Digestion	Gas exchange	Circulation
Locomotion	Reproduction	Molecules	Respiratory	Oxygen
Carbon dioxide	Excretory	Skeletal	Muscular	nervous
Endocrine	Hormones	Sex cells	Offspring	disease
Infection	Germ theory	Infectious	microbes	Cancers
Cell division	toxic	Dynamic equilibrium	Pregnancy	Dietary

Performance Indicators

1.2 Explain the functioning of the major human organ systems and their interactions.

4.4 Observe and describe cell division at the microscopic level and its macroscopic effects.

5.2 Describe the importance of major nutrients, vitamins, and minerals in maintaining health and promoting growth, and explain the need for a constant input of energy for living organisms.

Process Skills:
1. identify pulse points and pulse rates
2. identify structure and function relationships in organisms

Major Understandings:
1.2a Each system is composed of organs and tissues which perform specific functions and interact with each other, e.g., digestion, gas exchange, excretion, circulation, locomotion, control, coordination, reproduction, and protection from disease.

1.2b Tissues, organs, and organ systems help to provide all cells with nutrients, oxygen, and waste removal.

1.2c The digestive system consists of organs that are responsible for the mechanical and chemical breakdown of food. The breakdown process results in molecules that can be absorbed and transported to cells.

5.2a Food provides molecules that serve as fuel and building material for all organisms. All living things, including plants, must release energy from their food, using it to carry on their life processes.

5.2b Foods contain a variety of substances, which include carbohydrates, fats, vitamins, proteins, minerals, and water. Each substance is vital to the survival of the organism.

5.2c Metabolism is the sum of all chemical reactions in an organism. Metabolism can be influenced by hormones, exercise, diet, and aging.

5.2d Energy in foods is measured in Calories. The total caloric value of each type of food varies. The number of Calories a person requires varies from person to person.

5.2e In order to maintain a balanced state, all organisms have a minimum daily intake of each type of nutrient based on species, size, age, sex, activity, etc. An imbalance in any of the nutrients might result in weight gain, weight loss, or a diseased state.

1.2d During respiration, cells use oxygen to release the energy stored in food. The respiratory system supplies oxygen and removes carbon dioxide (gas exchange).

1.2e The excretory system functions in the disposal of dissolved waste molecules, the elimination of liquid and gaseous wastes, and the removal of excess heat energy.

1.2f The circulatory system moves substances to and from cells, where they are needed or produced, responding to changing demands.

1.2g Locomotion, necessary to escape danger, obtain food and shelter, and reproduce, is accomplished by the interaction of the skeletal and muscular systems, and coordinated by the nervous system.

1.2h The nervous and endocrine systems interact to control and coordinate the body's responses to changes in the environment, and to regulate growth, development, and reproduction. Hormones are chemicals produced by the endocrine system; hormones regulate many body functions.

1.2i The male and female reproductive systems are responsible for producing sex cells necessary for the production of offspring.

1.2j Disease breaks down the structures or functions of an organism. Some diseases are the result of failures of the system. Other diseases are the result of damage by infection from other organisms (germ theory). Specialized cells protect the body from infectious disease. The chemicals they produce identify and destroy microbes that enter the body.

4.4d Cancers are a result of abnormal cell division.

5.2f Contraction of infectious disease, and personal behaviors such as use of toxic substances and some dietary habits, may interfere with one's dynamic equilibrium. During pregnancy these conditions may also affect the development of the child. Some effects of these conditions are immediate; others may not appear for many years.

Labs:

1. Compare each major body system using research to design pamphlets, videos, power points, models.

2. After researching the importance of body systems, conduct a debate valuing the importance of each system in maintaining balance in our bodies.

3. Develop an experiment using the scientific method to measure pulse rates.

4. Research the minimal nutritional requirements for the human body at different age levels.

Expanded Process Skills:

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.

S2.1 Use conventional techniques and those of their own design to make further observations and refine their explanations, guided by a need for more information.

S2.1a demonstrate appropriate safety techniques

S2.1b conduct an experiment designed by others

S2.1c design and conduct an experiment to test a hypothesis

S2.1d use appropriate tools and conventional techniques to solve problems about the natural world, including: measuring, observing, describing

CCLS-LITERACY

CCLS.ELA- LITERACY.RST.6-9.3

Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

Genetics and Heredity

Standard 4: The Living Environment

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

Tier 2 Vocabulary

inherited	identical

Tier 3 Vocabulary

hereditary	gene	chromosomes	trait	asexual	probability
sexual	reproduction	parent	generation	dominant	recessive
Pedigree chart	Punnett Square				

Performance Indicators
2.1 Describe sexual and asexual mechanisms for passing genetic materials from generation to generation.

2.2 Describe simple mechanisms related to the inheritance of some physical traits in offspring.

Process Skills:
1. design and use a Punnett square or a pedigree chart to predict the probability of certain traits

Major Understandings:
2.1a hereditary information is contained in genes. Genes are composed of DNA that Makes up the chromosomes of cells.

2.1b Each gene carries a single unit of information. A single inherited trait of an individual can be determined by one pair or by many pairs of genes. A human cell contains thousands of different genes.

2.1c Each human cell contains a copy of all the genes needed to produce a human being.

2.1d In asexual reproduction, all the genes come from a single parent. Asexually produced offspring are genetically identical to the parent.

2.1e In sexual reproduction typically half of the genes come from each parent. Sexually produced offspring are not identical to either parent.

2.2a In all organisms, genetic traits are passed on from generation to generation.

2.2b Some genes are dominant and some are recessive. Some traits are inherited by mechanisms other than dominance and recessiveness.

2.2c The probability of traits being expressed can be determined using models of genetic inheritance. Some models of prediction are pedigree charts and Punnett squares.

Labs:

1. Probability and Genetics by ECSDM
   http://nylearns.org/module/content/search/item/5562/viewdetail.ashx#sthash.BhZmvj2t.dpbs

2. What color eyes would your children have?
   http://nylearns.org/module/content/search/item/3339/viewdetail.ashx#sthash.w2uwIlfq.dpbs

3. Baby Lab – using a coin to predict probability of traits in offspring.

4. Pedigree – Click and Drag Lab
   http://www.zerobio.com/drag_gr11/pedigree/pedigree_overview.htm

5. Using the Internet to do Punnett Squares
   http://www.uen.org/Lessonplan/preview.cgi?LPid=1806

Expanded Process Skills:

S3.1 Design charts, tables, graphs, and other representations of observations in conventional and creative ways to help them address their research question or hypothesis.

S3.1a organize results, using appropriate graphs, diagrams, data tables, and other models to show relationships

CCLS – LITERACY

CCSS.ELA- LITERACY.RST.6-8.7
Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

Fertilization, Reproduction and Development

Standard 4 – The Living Environment

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

Performance Indicators

4.1 Observe and describe the variations in reproductive patterns of organisms, including asexual and sexual reproduction.

4.2 Explain the role of sperm and egg cells in sexual reproduction

4.3 Observe and describe developmental patterns in selected plants and animals (e.g., insects, frogs, humans, seed-bearing plants).

4.4 Observe and describe cell division at the microscopic level and its macroscopic effects.

Tier 2 Vocabulary

Individual	Development	internal	External	Resemble
Various	Mature	Duplicated	Identical	Abnormal
Growth	Maintenance	repair		

Tier 3 Vocabulary

Asexual	Sexual reproduction	Egg	Sperm	Cell division
Fertilization	Internal fertilization	External fertilization	Genetic information	Multicellular
Metamorphosis	Life cycle	Chromosomes	Hereditary information	

Major Understandings:

4.1a Some organisms reproduce asexually. Other organisms reproduce sexually. Some organisms can reproduce both sexually and asexually.

4.1b There are many methods of asexual reproduction, including division of a cell into two cells, or separation of part of an animal or plant from the parent, resulting in the growth of another individual.

4.1c Methods of sexual reproduction depend upon the species. All methods involve the merging of sex cells to begin the development of a new individual. In many species, including plants and humans, eggs and sperm are produced.

4.2a The male sex cell is the sperm. The female sex cell is the egg. The fertilization of an egg by a sperm results in a fertilized egg.

4.2b In sexual reproduction, sperm and egg each carry one-half of the genetic information for the new individual. Therefore, the fertilized egg contains genetic information from each parent.

4.3a Multicellular organisms exhibit complex changes in development, which begin after fertilization. The fertilized egg undergoes numerous cellular divisions that will result in a multicellular organism, with each cell having identical genetic information.

4.3b In humans, the fertilized egg grows into tissue which develops into organs and organ systems before birth.

4.3c Various body structures and functions change as an organism goes through its life cycle.

4.3d Patterns of development vary among animals. In some species the young resemble the adult, while in others they do not. Some insects and amphibians undergo metamorphosis as they mature.

4.3e Patterns of development vary among plants. In seed-bearing plants, seeds contain stored food for early development. Their later development into adulthood is characterized by varying patterns of growth from species to species.

4.3f As an individual organism ages, various body structures and functions change.

4.4a In multicellular organisms, cell division is responsible for growth, maintenance, and repair. In some one-celled organisms, cell division is a method of asexual reproduction.

4.4b In one type of cell division, chromosomes are duplicated and then separated into two identical and complete sets to be passed to each of the two resulting cells. In this type of cell division, the hereditary information is identical in all the cells that result.

4.4c Another type of cell division accounts for the production of egg and sperm cells in sexually reproducing organisms. The eggs and sperm resulting from this type of cell division contain one-half of the hereditary information.

Labs:

1. How Cells Divide: http://nylearns.org/module/content/search/item/3517/viewdetail.ashx#sthash.kB6QuH6J.dpbs

2. Mitosis Flip Books http://sciencespot.net/Media/mitosisbook.pdf

3. Plant Pollination http://nylearns.org/module/content/search/item/18126/viewdetail.ashx#sthash.lk6uQMfP.dpbs

4. Comparison between mitosis and meiosis

5. Conduct an experiment showing the development of plants using different environmental variables: grow lights vs sunlight, different seeds, different soils, etc.

Expanded Process Skills:

Key Idea 1:

Information technology is used to retrieve, process, and communicate information as a tool to enhance learning.

1.1 Use a range of equipment and software to integrate several forms of information in order to create good-quality audio, video, graphic, and text-based presentations.

CCLS-LITERACY

CCLS.ELA-LITERACY.RST.6.8.1

Cite specific textual evidence to support analysis of science and technical texts.

CCLS.ELA-LITERACY.RST.6.8.2

Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

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Evolution and Species Variation

Standard 4 – The Living Environment

Key Idea 3:
Individual organisms and species change over time.

Tier 2 Vocabulary

Variation	Structures	Survival	Offspring	Successive
Ancestors	Deposited	significant		

Tier 3 Vocabulary

Traits	Genes	Species	Mutation	Selective breeding
Genetic engineering	Environment	Resources	Extinction	Fossil
Sedimentary rock				

Performance Indicators
3.1 Describe sources of variation in organisms and their structures and relate the variations to survival.

3.2 Describe factors responsible for competition within species and the significance of that competition

Major Understandings:
3.1a The processes of sexual reproduction and mutation have given rise to a variety of traits within a species.

3.1b Changes in environmental conditions can affect the survival of individual organisms with a particular trait. Small differences between parents and offspring can accumulate in successive generations so that descendants are very different from their ancestors. Individual organisms with certain traits are more likely to survive and have offspring than individuals without those traits.

3.1c Human activities such as selective breeding and advances in genetic engineering may affect the variations of species.

3.2a In all environments, organisms with similar needs may compete with one another for resources.

3.2b Extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to permit its survival. Extinction of species is common. Fossils are evidence that a great variety of species existed in the past.

3.2c Many thousands of layers of sedimentary rock provide evidence for the long history of Earth and for the long history of changing life forms whose remains are found in the rocks. Recently deposited rock layers are more likely to contain fossils resembling existing species.

3.2d Although the time needed for change in a species is usually great, some species of insects and bacteria have undergone significant change in just a few years.

Labs:

1. Wolves at our Door (Selective Breeding)
   http://nylearns.org/module/content/search/item/18135/viewdetail.ashx#sthash.P6cks22o.dpbs

2. The Clone Age
   http://nylearns.org/module/content/search/item/18105/viewdetail.ashx#sthash.ftSCzH06.dpbs

3. Genetics
   http://nylearns.org/module/content/search/item/18118/viewdetail.ashx#sthash.nd0oOz3z.dpbs

Expanded Process Skills:

S1.4 Seek to clarify, to assess critically, and to reconcile with their own thinking the ideas presented by others, including peers, teachers, authors, and scientists.

7.1 Analyze science/technology/society problems and issues at the local level and plan and carry out a remedial course of action.

CCLS – LITERACY

CCLS.ELA-LITERACY.RST.6.8.8
Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

CCLS.ELA-LITERACY.WST.6.8.1
Write arguments focused on discipline-specific content.
Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.

Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.

CCLS.ELA-LITERACY.WST.6.8.1b
Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.

Dynamic Equilibrium and Energy Use

Standard 4: The Living Environment

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.

Tier 2 Vocabulary

Variety	Maintain	Regulation	Sense	Respond
Survival	Imbalance	contradiction		

Tier 3 Vocabulary

Nutrients	Producers	Consumers	Herbivores	Carnivores	Omnivores
Ecosystems	Food chain	Energy pyramids	Food webs	Nitrogen	Carbon dioxide
Oxygen	Photosynthesis	Chlorophyll	Sunlight	Sugar molecules	

Performance Indicators
5.1 Compare the way a variety of living specimens carry out basic life functions and maintain dynamic equilibrium.

6.1 Describe the flow of energy and matter through food chains and food webs.

6.2 Provide evidence that green plants make food and explain the significance of this process to other organisms.

Process Skills
1. interpret and/or illustrate the energy flow in a food chain, energy pyramid, or food web
2. identify structure and function relationships in organisms

Major Understandings:
5.1d The methods for obtaining nutrients vary among organisms. Producers, such as green plants, use light energy to make their food. Consumers, such as animals, take in energy-rich foods.
5.1e Herbivores obtain energy from plants. Carnivores obtain energy from animals. Omnivores obtain energy from both plants and animals. Decomposers, such as bacteria and fungi, obtain energy by consuming wastes and/or dead organisms

6.1a Energy flows through ecosystems in one direction, usually from the Sun, through producers to consumers and then to decomposers. This process may be visualized with food chains or energy pyramids.

6.1b Food webs identify feeding relationships among producers, consumers, and decomposers in an ecosystem.

6.1c Matter is transferred from one organism to another and between organisms and their physical environment. Water, nitrogen, carbon dioxide, and oxygen are examples of substances cycled between the living and nonliving environment.

6.2a Photosynthesis is carried on by green plants and other organisms containing chlorophyll. In this process, the Sun's energy is converted into and stored as chemical energy in the form of a sugar. The quantity of sugar molecules increases in green plants during photosynthesis in the presence of sunlight.

6.2b The major source of atmospheric oxygen is photosynthesis. Carbon dioxide is removed from the atmosphere and oxygen is released during photosynthesis.

6.2c Green plants are the producers of food which is used directly or indirectly by consumers.

Labs:

Expanded Process Skills:
Key Idea 3: The observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insights into phenomena.
S3.1 Design charts, tables, graphs, and other representations of observations in conventional and creative ways to help them address their research question or hypothesis.
S3.1a organize results, using appropriate graphs, diagrams, data tables, and other models to show relationships

CCLS-LITERACY
CCLS.ELA-LITERACY.RST.6-8.7
Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

CCLS.ELA-LITERACY.WHST.6-8.2
Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.

Ecology and Human Impacts

Standard 4: - The Living Environment

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

Tier 2 Vocabulary

Interacts	Resources	Relationships	Monitoring	Alterations
cumulative				

Tier 3 Vocabulary

Population	Community	Ecosystem	Predation	Interactions
Competitive	Harmful relationships	Beneficial relationships	Habitat	Species
Pollutants	Balance or interactions	Ecological succession	Overpopulation	Degradation
Urban growth	Land-use	Resource acquisition	Conservation	Acid rain
Global warming	Ozone depletion			

Performance Indicators

7.1 Describe how living things, including humans, depend upon the living and nonliving environment for their survival.

7.2 Describe the effects of environmental changes on humans and other populations.

Major Understandings:

7.1a A population consists of all individuals of a species that are found together at a given place and time. Populations living in one place form a community. The community and the physical factors with which it interacts compose an ecosystem.

7.1b Given adequate resources and no disease or predators, populations (including humans) increase. Lack of resources, habitat destruction, and other factors such as predation and climate limit the growth of certain populations in the ecosystem.

7.1c In all environments, organisms interact with one another in many ways. Relationships among organisms may be competitive, harmful, or beneficial. Some species have adapted to be dependent upon each other with the result that neither could survive without the other.

7.1d Some microorganisms are essential to the survival of other living things.

7.1e The environment may contain dangerous levels of substances (pollutants) that are harmful to organisms. Therefore, the good health of environments and individuals requires the monitoring of soil, air, and water, and taking steps to keep them safe.

7.2a In ecosystems, balance is the result of interactions between community members and their environment.

7.2b The environment may be altered through the activities of organisms. Alterations are sometimes abrupt. Some species may replace others over time, resulting in long term gradual changes (ecological succession).

7.2c Overpopulation by any species impacts the environment due to the increased use of resources. Human activities can bring about environmental degradation through resource acquisition, urban growth, land-use decisions, waste disposal, etc.

7.2d Since the Industrial Revolution, human activities have resulted in major pollution of air, water, and soil. Pollution has cumulative ecological effects such as acid rain, global warming, or ozone depletion. The survival of living things on our planet depends on the conservation and protection of Earth's resources.

Labs:

Expanded Process Skills:
S1.3 Represent, present, and defend their proposed explanations of everyday observations so that they can be understood and assessed by others.
S1.4 Seek to clarify, to assess critically, and to reconcile with their own thinking the ideas presented by others, including peers, teachers, authors, and scientists.

CCLS-LITERACY
CCLS.ELA-LITERACY.WHST.6-8.2
Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.