

Florida Tutorials are designed specifically for the New Florida Standards for Math and English Language Arts and the Next Generation Sunshine State Standards (NGSSS) for science and social studies to prepare students for the Florida Standards Assessments and the NGSSS End-of-Course (EOC) exams.

Biology Tutorials offer targeted instruction, practice, and review designed to help students develop fluency, deepen conceptual understanding, and apply scientific thinking skills. Students engage with the content in an interactive, feedback-rich environment as they progress through standards-aligned modules. By constantly honing their ability to explain and analyze biological scenarios, students build the depth of knowledge and higher-order skills required to demonstrate their mastery when put to the test.

In each module, the Learn It and Try It make complex ideas accessible through focused content, guided analysis, multi-modal representations, and personalized feedback as students reason through increasingly challenging problems. The Review It offers a high-impact summary of key concepts and relates those concepts to students' lives. The Test It assesses students' mastery of the module's concepts, providing granular performance data to students and teachers after each attempt. To help students focus on the content most relevant to them, unit-level pretests and posttests can quickly identify where students are strong and where they're still learning.

## Unit 1: Chemistry of Life

### • BIOMOLECULES

- SC.912.L.18.A: Matter and Energy Transformations All living things are composed of four basic categories of macromolecules and share the same basic needs for life.
- SC.912.L.18.1: Matter and Energy Transformations Describe the basic molecular structures and primary functions of the four major categories of biological macromolecules.
- SC.912.L.18.2: Matter and Energy Transformations Describe the important structural characteristics of monosaccharides, disaccharides, and polysaccharides and explain the functions of carbohydrates in living things.
- SC.912.L.18.4: Matter and Energy Transformations Describe the structures of proteins and amino acids. Explain the functions of proteins in living organisms. Identify some reactions that amino acids undergo. Relate the structure and function of enzymes.
- SC.912.L.18.3: Matter and Energy Transformations Describe the structures of fatty acids, triglycerides, phospholipids, and steroids. Explain the functions of lipids in living organisms. Identify some reactions that fatty acids undergo. Relate the structure and function of cell membranes.

### • ENZYMES

- SC.912.L.18.C: Matter and Energy Transformations Chemical reactions in living things follow basic rules of chemistry and are usually regulated by enzymes.
- SC.912.L.18.4: Matter and Energy Transformations Describe the structures of proteins and amino acids. Explain the functions of proteins in living organisms. Identify some reactions that amino acids undergo. Relate the structure and function of enzymes.
- SC.912.L.18.11: Matter and Energy Transformations Explain the role of enzymes as catalysts that lower the activation energy of biochemical reactions. Identify factors, such as pH and temperature, and their effect on enzyme activity.

## Unit 2: Cell Structure and Function

### • PROKARYOTIC AND EUKARYOTIC CELLS

- SC.912.L.14.1: Organization and Development of Living Organisms Describe the scientific theory of cells (cell theory) and relate the history of its discovery to the process of science.
- SC.912.L.14.5: Organization and Development of Living Organisms Explain the evidence supporting the scientific theory of the origin of eukaryotic cells (endosymbiosis).
- SC.912.L.14.A: Organization and Development of Living Organisms Cells have characteristic structures and functions that make them distinctive.
- SC.912.L.14.B: Organization and Development of Living Organisms Processes in a cell can be classified broadly as growth, maintenance, reproduction, and homeostasis.
- SC.912.L.14.2: Organization and Development of Living Organisms Relate structure to function for the components of plant and animal cells. Explain the role of cell membranes as a highly selective barrier (passive and active transport).
- SC.912.L.14.3: Organization and Development of Living Organisms Compare and contrast the general structures of plant and animal cells. Compare and contrast the general structures of prokaryotic and eukaryotic cells.
- SC.912.L.18.3: Matter and Energy Transformations Describe the structures of fatty acids, triglycerides, phospholipids, and steroids. Explain the functions of lipids in living organisms. Identify some reactions that fatty acids undergo. Relate the structure and function of cell membranes.
- SC.912.L.18.7: Matter and Energy Transformations Identify the reactants, products, and basic functions of photosynthesis.
- SC.912.L.18.8: Matter and Energy Transformations Identify the reactants, products, and basic functions of aerobic and anaerobic cellular respiration.
- SC.912.L.14.6: Organization and Development of Living Organisms Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health.

### • PLANT AND ANIMAL CELLS

- SC.912.L.14.2: Organization and Development of Living Organisms Relate structure to function for the components of plant and animal cells. Explain the role of cell membranes as a highly selective barrier

(passive and active transport).

- SC.912.L.14.3: Organization and Development of Living Organisms Compare and contrast the general structures of plant and animal cells. Compare and contrast the general structures of prokaryotic and eukaryotic cells.
- SC.912.L.14.A: Organization and Development of Living Organisms Cells have characteristic structures and functions that make them distinctive.
- SC.912.L.14.B: Organization and Development of Living Organisms Processes in a cell can be classified broadly as growth, maintenance, reproduction, and homeostasis.
- **PASSIVE TRANSPORT**
  - SC.912.L.14.A: Organization and Development of Living Organisms Cells have characteristic structures and functions that make them distinctive.
  - SC.912.L.14.B: Organization and Development of Living Organisms Processes in a cell can be classified broadly as growth, maintenance, reproduction, and homeostasis.
  - SC.912.L.14.2: Organization and Development of Living Organisms Relate structure to function for the components of plant and animal cells. Explain the role of cell membranes as a highly selective barrier (passive and active transport).
  - SC.912.L.14.3: Organization and Development of Living Organisms Compare and contrast the general structures of plant and animal cells. Compare and contrast the general structures of prokaryotic and eukaryotic cells.
  - SC.912.L.18.3: Matter and Energy Transformations Describe the structures of fatty acids, triglycerides, phospholipids, and steroids. Explain the functions of lipids in living organisms. Identify some reactions that fatty acids undergo. Relate the structure and function of cell membranes.
- **ACTIVE TRANSPORT**
  - SC.912.L.14.A: Organization and Development of Living Organisms Cells have characteristic structures and functions that make them distinctive.
  - SC.912.L.14.B: Organization and Development of Living Organisms Processes in a cell can be classified broadly as growth, maintenance, reproduction, and homeostasis.
  - SC.912.L.14.2: Organization and Development of Living Organisms Relate structure to function for the components of plant and animal cells. Explain the role of cell membranes as a highly selective barrier (passive and active transport).
  - SC.912.L.14.3: Organization and Development of Living Organisms Compare and contrast the general structures of plant and animal cells. Compare and contrast the general structures of prokaryotic and eukaryotic cells.

### Unit 3: Cellular Energetics

- **PHOTOSYNTHESIS**
  - SC.912.L.18.7: Matter and Energy Transformations Identify the reactants, products, and basic functions of photosynthesis.

- SC.912.L.18.9: Matter and Energy Transformations Explain the interrelated nature of photosynthesis and cellular respiration.
- SC.912.L.18.10: Matter and Energy Transformations Connect the role of adenosine triphosphate (ATP) to energy transfers within a cell.
- SC.912.L.14.2: Organization and Development of Living Organisms Relate structure to function for the components of plant and animal cells. Explain the role of cell membranes as a highly selective barrier (passive and active transport).
- SC.912.L.14.3: Organization and Development of Living Organisms Compare and contrast the general structures of plant and animal cells. Compare and contrast the general structures of prokaryotic and eukaryotic cells.
- SC.912.L.18.5: Matter and Energy Transformations Discuss the use of chemiosmotic gradients for ATP production in chloroplasts and mitochondria.
- **CELLULAR RESPIRATION**
  - SC.912.L.18.B: Matter and Energy Transformations Living organisms acquire the energy they need for life processes through various metabolic pathways (primarily photosynthesis and cellular respiration).
  - SC.912.L.18.6: Matter and Energy Transformations Discuss the role of anaerobic respiration in living things and in human society.
  - SC.912.L.18.8: Matter and Energy Transformations Identify the reactants, products, and basic functions of aerobic and anaerobic cellular respiration.
  - SC.912.L.18.9: Matter and Energy Transformations Explain the interrelated nature of photosynthesis and cellular respiration.
  - SC.912.L.18.10: Matter and Energy Transformations Connect the role of adenosine triphosphate (ATP) to energy transfers within a cell.
  - SC.912.L.14.2: Organization and Development of Living Organisms Relate structure to function for the components of plant and animal cells. Explain the role of cell membranes as a highly selective barrier (passive and active transport).
  - SC.912.L.14.3: Organization and Development of Living Organisms Compare and contrast the general structures of plant and animal cells. Compare and contrast the general structures of prokaryotic and eukaryotic cells.
  - SC.912.L.14.A: Organization and Development of Living Organisms Cells have characteristic structures and functions that make them distinctive.

#### Unit 4: Cell Growth and Reproduction

- **THE CELL CYCLE**
  - SC.912.L.14.B: Organization and Development of Living Organisms Processes in a cell can be classified broadly as growth, maintenance, reproduction, and homeostasis.
  - SC.912.L.16.14: Heredity and Reproduction Describe the cell cycle, including the process of mitosis. Explain the role of mitosis in the formation of new cells and its importance in maintaining

chromosome number during asexual reproduction.

- SC.912.L.16.3: Heredity and Reproduction Describe the basic process of DNA replication and how it relates to the transmission and conservation of the genetic information.
- SC.912.L.16.15: Heredity and Reproduction Compare and contrast binary fission and mitotic cell division.
- SC.912.L.14.2: Organization and Development of Living Organisms Relate structure to function for the components of plant and animal cells. Explain the role of cell membranes as a highly selective barrier (passive and active transport).
- SC.912.L.14.3: Organization and Development of Living Organisms Compare and contrast the general structures of plant and animal cells. Compare and contrast the general structures of prokaryotic and eukaryotic cells.
- SC.912.L.14.6: Organization and Development of Living Organisms Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health.
- SC.912.L.16.8: Heredity and Reproduction Explain the relationship between mutation, cell cycle, and uncontrolled cell growth potentially resulting in cancer.
- **MITOSIS**
  - SC.912.L.14.B: Organization and Development of Living Organisms Processes in a cell can be classified broadly as growth, maintenance, reproduction, and homeostasis.
  - SC.912.L.16.14: Heredity and Reproduction Describe the cell cycle, including the process of mitosis. Explain the role of mitosis in the formation of new cells and its importance in maintaining chromosome number during asexual reproduction.
  - SC.912.L.16.15: Heredity and Reproduction Compare and contrast binary fission and mitotic cell division.
  - SC.912.L.16.17: Heredity and Reproduction Compare and contrast mitosis and meiosis and relate to the processes of sexual and asexual reproduction and their consequences for genetic variation.

## Unit 5: DNA Structure and Function

- **COMPONENTS OF DNA**
  - SC.912.L.16.A: Heredity and Reproduction DNA stores and transmits genetic information. Genes are sets of instructions encoded in the structure of DNA.
  - SC.912.L.16.B: Heredity and Reproduction Genetic information is passed from generation to generation by DNA in all organisms and accounts for similarities in related individuals.
  - SC.912.L.16.3: Heredity and Reproduction Describe the basic process of DNA replication and how it relates to the transmission and conservation of the genetic information.
  - SC.912.L.18.A: Matter and Energy Transformations All living things are composed of four basic categories of macromolecules and share the same basic needs for life.

- SC.912.L.18.1: Matter and Energy Transformations Describe the basic molecular structures and primary functions of the four major categories of biological macromolecules.
- SC.912.L.14.1: Organization and Development of Living Organisms Describe the scientific theory of cells (cell theory) and relate the history of its discovery to the process of science.
- **THE GENETIC CODE**
  - SC.912.L.16.A: Heredity and Reproduction DNA stores and transmits genetic information. Genes are sets of instructions encoded in the structure of DNA.
  - SC.912.L.16.B: Heredity and Reproduction Genetic information is passed from generation to generation by DNA in all organisms and accounts for similarities in related individuals.
  - SC.912.L.16.9: Heredity and Reproduction Explain how and why the genetic code is universal and is common to almost all organisms.
  - SC.912.L.16.3: Heredity and Reproduction Describe the basic process of DNA replication and how it relates to the transmission and conservation of the genetic information.
  - SC.912.L.16.5: Heredity and Reproduction Explain the basic processes of transcription and translation, and how they result in the expression of genes.
  - SC.912.L.16.6: Heredity and Reproduction Discuss the mechanisms for regulation of gene expression in prokaryotes and eukaryotes at transcription and translation level.
  - SC.912.L.16.10: Heredity and Reproduction Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues.
- **DNA REPLICATION**
  - SC.912.L.16.3: Heredity and Reproduction Describe the basic process of DNA replication and how it relates to the transmission and conservation of the genetic information.

## Unit 6: Gene Expression

- **TRANSCRIPTION**
  - SC.912.L.16.A: Heredity and Reproduction DNA stores and transmits genetic information. Genes are sets of instructions encoded in the structure of DNA.
  - SC.912.L.16.B: Heredity and Reproduction Genetic information is passed from generation to generation by DNA in all organisms and accounts for similarities in related individuals.
  - SC.912.L.16.3: Heredity and Reproduction Describe the basic process of DNA replication and how it relates to the transmission and conservation of the genetic information.
  - SC.912.L.16.5: Heredity and Reproduction Explain the basic processes of transcription and translation, and how they result in the expression of genes.
  - SC.912.L.18.A: Matter and Energy Transformations All living things are composed of four basic categories of macromolecules and share the same basic needs for life.
  - SC.912.L.18.1: Matter and Energy Transformations Describe the basic molecular structures and primary functions of the four major categories of biological macromolecules.

- SC.912.L.16.6: Heredity and Reproduction Discuss the mechanisms for regulation of gene expression in prokaryotes and eukaryotes at transcription and translation level.
- **TRANSLATION**
- SC.912.L.16.3: Heredity and Reproduction Describe the basic process of DNA replication and how it relates to the transmission and conservation of the genetic information.
- SC.912.L.16.4: Heredity and Reproduction Explain how mutations in the DNA sequence may or may not result in phenotypic change. Explain how mutations in gametes may result in phenotypic changes in offspring.
- SC.912.L.16.5: Heredity and Reproduction Explain the basic processes of transcription and translation, and how they result in the expression of genes.
- SC.912.L.16.16: Heredity and Reproduction Describe the process of meiosis, including independent assortment and crossing over. Explain how reduction division results in the formation of haploid gametes or spores.
- SC.912.L.18.1: Matter and Energy Transformations Describe the basic molecular structures and primary functions of the four major categories of biological macromolecules.
- SC.912.L.14.17: Organization and Development of Living Organisms List the steps involved in the sliding filament of muscle contraction.
- SC.912.L.18.C: Matter and Energy Transformations Chemical reactions in living things follow basic rules of chemistry and are usually regulated by enzymes.
- SC.912.L.18.4: Matter and Energy Transformations Describe the structures of proteins and amino acids. Explain the functions of proteins in living organisms. Identify some reactions that amino acids undergo. Relate the structure and function of enzymes.

## Unit 7: Mutations

- **GENETIC CHANGES IN DNA**
- SC.912.L.14.6: Organization and Development of Living Organisms Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health.
- SC.912.L.15.15: Diversity and Evolution of Living Organisms Describe how mutation and genetic recombination increase genetic variation.
- SC.912.L.16.4: Heredity and Reproduction Explain how mutations in the DNA sequence may or may not result in phenotypic change. Explain how mutations in gametes may result in phenotypic changes in offspring.
- **GENETIC CHANGES IN CHROMOSOMES**
- SC.912.L.15.15: Diversity and Evolution of Living Organisms Describe how mutation and genetic recombination increase genetic variation.
- SC.912.L.16.10: Heredity and Reproduction Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues.



- SC.912.L.16.16: Heredity and Reproduction Describe the process of meiosis, including independent assortment and crossing over. Explain how reduction division results in the formation of haploid gametes or spores.
- SC.912.L.16.17: Heredity and Reproduction Compare and contrast mitosis and meiosis and relate to the processes of sexual and asexual reproduction and their consequences for genetic variation.
- SC.912.L.14.6: Organization and Development of Living Organisms Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health.
- SC.912.L.16.4: Heredity and Reproduction Explain how mutations in the DNA sequence may or may not result in phenotypic change. Explain how mutations in gametes may result in phenotypic changes in offspring.

### Unit 8: Heredity

- **MENDELIAN LAWS OF HEREDITY**

- SC.912.L.16.1: Heredity and Reproduction Use Mendel's laws of segregation and independent assortment to analyze patterns of inheritance.
- SC.912.L.16.2: Heredity and Reproduction Discuss observed inheritance patterns caused by various modes of inheritance, including dominant, recessive, codominant, sex-linked, polygenic, and multiple alleles.
- SC.912.L.16.17: Heredity and Reproduction Compare and contrast mitosis and meiosis and relate to the processes of sexual and asexual reproduction and their consequences for genetic variation.

- **MULTIPLE ALLELES AND ALLELES WITHOUT DOMINANCE**

- SC.912.L.16.2: Heredity and Reproduction Discuss observed inheritance patterns caused by various modes of inheritance, including dominant, recessive, codominant, sex-linked, polygenic, and multiple alleles.

### Unit 9: Reproduction

- **SEXUAL AND ASEXUAL REPRODUCTION**

- SC.912.L.15.13: Diversity and Evolution of Living Organisms Describe the conditions required for natural selection, including: overproduction of offspring, inherited variation, and the struggle to survive, which result in differential reproductive success.
- SC.912.L.15.15: Diversity and Evolution of Living Organisms Describe how mutation and genetic recombination increase genetic variation.
- SC.912.L.16.D: Heredity and Reproduction Reproduction is characteristic of living things and is essential for the survival of species.
- SC.912.L.16.14: Heredity and Reproduction Describe the cell cycle, including the process of mitosis. Explain the role of mitosis in the formation of new cells and its importance in maintaining chromosome number during asexual reproduction.



- SC.912.L.16.17: Heredity and Reproduction Compare and contrast mitosis and meiosis and relate to the processes of sexual and asexual reproduction and their consequences for genetic variation.
- SC.912.L.16.15: Heredity and Reproduction Compare and contrast binary fission and mitotic cell division.
- SC.912.L.16.16: Heredity and Reproduction Describe the process of meiosis, including independent assortment and crossing over. Explain how reduction division results in the formation of haploid gametes or spores.
- **MEIOSIS**
  - SC.912.L.16.16: Heredity and Reproduction Describe the process of meiosis, including independent assortment and crossing over. Explain how reduction division results in the formation of haploid gametes or spores.
  - SC.912.L.16.17: Heredity and Reproduction Compare and contrast mitosis and meiosis and relate to the processes of sexual and asexual reproduction and their consequences for genetic variation.
  - SC.912.L.15.15: Diversity and Evolution of Living Organisms Describe how mutation and genetic recombination increase genetic variation.
  - SC.912.L.16.1: Heredity and Reproduction Use Mendel's laws of segregation and independent assortment to analyze patterns of inheritance.
  - SC.912.L.15.D: Diversity and Evolution of Living Organisms Natural selection is a primary mechanism leading to evolutionary change.
  - SC.912.L.15.13: Diversity and Evolution of Living Organisms Describe the conditions required for natural selection, including: overproduction of offspring, inherited variation, and the struggle to survive, which result in differential reproductive success.

## Unit 10: Evolution

- **MULTIPLE LINES OF EVIDENCE**
  - SC.912.L.15.A: Diversity and Evolution of Living Organisms The scientific theory of evolution is the fundamental concept underlying all of biology.
  - SC.912.L.15.B: Diversity and Evolution of Living Organisms The scientific theory of evolution is supported by multiple forms of scientific evidence.
  - SC.912.L.15.C: Diversity and Evolution of Living Organisms Organisms are classified based on their evolutionary history.
  - SC.912.L.15.1: Diversity and Evolution of Living Organisms Explain how the scientific theory of evolution is supported by the fossil record, comparative anatomy, comparative embryology, biogeography, molecular biology, and observed evolutionary change.
  - SC.912.L.15.4: Diversity and Evolution of Living Organisms Describe how and why organisms are hierarchically classified and based on evolutionary relationships.
  - SC.912.L.15.8: Diversity and Evolution of Living Organisms Describe the scientific explanations of the origin of life on Earth.

- SC.912.L.14.10: Organization and Development of Living Organisms Discuss the relationship between the evolution of land plants and their anatomy.
- SC.912.L.16.9: Heredity and Reproduction Explain how and why the genetic code is universal and is common to almost all organisms.
- **THE FOSSIL RECORD**
- SC.912.L.15.A: Diversity and Evolution of Living Organisms The scientific theory of evolution is the fundamental concept underlying all of biology.
- SC.912.L.15.B: Diversity and Evolution of Living Organisms The scientific theory of evolution is supported by multiple forms of scientific evidence.
- SC.912.L.15.C: Diversity and Evolution of Living Organisms Organisms are classified based on their evolutionary history.
- SC.912.L.15.1: Diversity and Evolution of Living Organisms Explain how the scientific theory of evolution is supported by the fossil record, comparative anatomy, comparative embryology, biogeography, molecular biology, and observed evolutionary change.
- SC.912.L.15.4: Diversity and Evolution of Living Organisms Describe how and why organisms are hierarchically classified and based on evolutionary relationships.

## Unit 11: Mechanisms of Evolution

- **NATURAL SELECTION**
- SC.912.L.15.13: Diversity and Evolution of Living Organisms Describe the conditions required for natural selection, including: overproduction of offspring, inherited variation, and the struggle to survive, which result in differential reproductive success.
- SC.912.L.15.14: Diversity and Evolution of Living Organisms Discuss mechanisms of evolutionary change other than natural selection such as genetic drift and gene flow.
- SC.912.L.15.D: Diversity and Evolution of Living Organisms Natural selection is a primary mechanism leading to evolutionary change.
- **EVOLUTION OF SPECIES**
- SC.912.L.15.B: Diversity and Evolution of Living Organisms The scientific theory of evolution is supported by multiple forms of scientific evidence.
- SC.912.L.15.D: Diversity and Evolution of Living Organisms Natural selection is a primary mechanism leading to evolutionary change.
- SC.912.L.15.9: Diversity and Evolution of Living Organisms Explain the role of reproductive isolation in the process of speciation.
- SC.912.L.15.A: Diversity and Evolution of Living Organisms The scientific theory of evolution is the fundamental concept underlying all of biology.
- SC.912.L.15.1: Diversity and Evolution of Living Organisms Explain how the scientific theory of evolution is supported by the fossil record, comparative anatomy, comparative embryology, biogeography, molecular biology, and observed evolutionary change.

- SC.912.L.15.13: Diversity and Evolution of Living Organisms Describe the conditions required for natural selection, including: overproduction of offspring, inherited variation, and the struggle to survive, which result in differential reproductive success.
- SC.912.L.15.14: Diversity and Evolution of Living Organisms Discuss mechanisms of evolutionary change other than natural selection such as genetic drift and gene flow.

## Unit 12: Classification

### • TAXONOMY

- SC.912.L.14.53: Organization and Development of Living Organisms Discuss basic classification and characteristics of plants. Identify bryophytes, pteridophytes, gymnosperms, and angiosperms.
- SC.912.L.15.C: Diversity and Evolution of Living Organisms Organisms are classified based on their evolutionary history.
- SC.912.L.15.4: Diversity and Evolution of Living Organisms Describe how and why organisms are hierarchically classified and based on evolutionary relationships.
- SC.912.L.15.5: Diversity and Evolution of Living Organisms Explain the reasons for changes in how organisms are classified.
- SC.912.L.15.6: Diversity and Evolution of Living Organisms Discuss distinguishing characteristics of the domains and kingdoms of living organisms.
- SC.912.L.15.7: Diversity and Evolution of Living Organisms Discuss distinguishing characteristics of vertebrate and representative invertebrate phyla, and chordate classes using typical examples.
- SC.912.L.16.10: Heredity and Reproduction Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues.

### • THE SIX KINGDOMS

- SC.912.L.14.3: Organization and Development of Living Organisms Compare and contrast the general structures of plant and animal cells. Compare and contrast the general structures of prokaryotic and eukaryotic cells.
- SC.912.L.14.9: Organization and Development of Living Organisms Relate the major structure of fungi to their functions.
- SC.912.L.14.53: Organization and Development of Living Organisms Discuss basic classification and characteristics of plants. Identify bryophytes, pteridophytes, gymnosperms, and angiosperms.
- SC.912.L.15.C: Diversity and Evolution of Living Organisms Organisms are classified based on their evolutionary history.
- SC.912.L.15.4: Diversity and Evolution of Living Organisms Describe how and why organisms are hierarchically classified and based on evolutionary relationships.
- SC.912.L.15.5: Diversity and Evolution of Living Organisms Explain the reasons for changes in how organisms are classified.

- SC.912.L.15.6: Diversity and Evolution of Living Organisms Discuss distinguishing characteristics of the domains and kingdoms of living organisms.

### Unit 13: Functions of Animal Systems

- **HOMEOSTASIS AND DYNAMIC EQUILIBRIUM**

- SC.912.L.14.B: Organization and Development of Living Organisms Processes in a cell can be classified broadly as growth, maintenance, reproduction, and homeostasis.
- SC.912.L.14.6: Organization and Development of Living Organisms Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health.

- **THE IMMUNE AND LYMPHATIC SYSTEMS**

- SC.912.L.14.D: Organization and Development of Living Organisms Most multicellular organisms are composed of organ systems whose structures reflect their particular function.
- SC.912.L.14.42: Organization and Development of Living Organisms Describe the anatomy and the physiology of the lymph system.
- SC.912.L.14.52: Organization and Development of Living Organisms Explain the basic functions of the human immune system, including specific and nonspecific immune response, vaccines, and antibiotics.
- SC.912.L.14.B: Organization and Development of Living Organisms Processes in a cell can be classified broadly as growth, maintenance, reproduction, and homeostasis.
- SC.912.L.14.6: Organization and Development of Living Organisms Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health.

- **THE NERVOUS SYSTEM**

- SC.912.L.14.D: Organization and Development of Living Organisms Most multicellular organisms are composed of organ systems whose structures reflect their particular function.
- SC.912.L.14.21: Organization and Development of Living Organisms Describe the anatomy, histology, and physiology of the central and peripheral nervous systems and name the major divisions of the nervous system.
- SC.912.L.14.50: Organization and Development of Living Organisms Describe the structure of vertebrate sensory organs. Relate structure to function in vertebrate sensory systems.
- SC.912.L.14.25: Organization and Development of Living Organisms Identify the major parts of a cross section through the spinal cord.
- SC.912.L.14.26: Organization and Development of Living Organisms Identify the major parts of the brain on diagrams or models.
- SC.912.L.14.27: Organization and Development of Living Organisms Identify the functions of the major parts of the brain, including the meninges, medulla, pons, midbrain, hypothalamus, thalamus, cerebellum and cerebrum.

- SC.912.L.14.28: Organization and Development of Living Organisms Identify the major functions of the spinal cord.
- SC.912.L.14.49: Organization and Development of Living Organisms Identify the major functions associated with the sympathetic and parasympathetic nervous systems.

#### Unit 14: Functions of Plant Systems

- **PLANT TISSUES**

- SC.912.L.14.2: Organization and Development of Living Organisms Relate structure to function for the components of plant and animal cells. Explain the role of cell membranes as a highly selective barrier (passive and active transport).
- SC.912.L.14.7: Organization and Development of Living Organisms Relate the structure of each of the major plant organs and tissues to physiological processes.

- **PLANT RESPONSES**

- SC.912.L.14.7: Organization and Development of Living Organisms Relate the structure of each of the major plant organs and tissues to physiological processes.
- SC.912.L.14.31: Organization and Development of Living Organisms Describe the physiology of hormones including the different types and the mechanisms of their action.

#### Unit 15: Cycles in Nature

- **THE CARBON CYCLE**

- SC.912.L.17.10: Interdependence Diagram and explain the biogeochemical cycles of an ecosystem, including water, carbon, and nitrogen cycle.
- SC.912.L.17.16: Interdependence Discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gases, ozone depletion, and surface and groundwater pollution.
- SC.912.L.17.4: Interdependence Describe changes in ecosystems resulting from seasonal variations, climate change and succession.
- SC.912.L.17.8: Interdependence Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species.
- SC.912.L.17.20: Interdependence Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.

- **THE NITROGEN AND PHOSPHORUS CYCLES**

- SC.912.L.17.10: Interdependence Diagram and explain the biogeochemical cycles of an ecosystem, including water, carbon, and nitrogen cycle.
- SC.912.L.17.B: Interdependence Energy and nutrients move within and between biotic and abiotic components of ecosystems via physical, chemical and biological processes.

- SC.912.L.17.C: Interdependence Human activities and natural events can have profound effects on populations, biodiversity and ecosystem processes.
- SC.912.L.17.20: Interdependence Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.

### Unit 16: Matter and Energy

- **FOOD CHAINS AND WEBS**

- SC.912.L.17.9: Interdependence Use a food web to identify and distinguish producers, consumers, and decomposers. Explain the pathway of energy transfer through trophic levels and the reduction of available energy at successive trophic levels.
- SC.912.L.17.5: Interdependence Analyze how population size is determined by births, deaths, immigration, emigration, and limiting factors (biotic and abiotic) that determine carrying capacity.
- SC.912.L.17.A: Interdependence The distribution and abundance of organisms is determined by the interactions between organisms, and between organisms and the non-living environment.
- SC.912.L.17.8: Interdependence Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species.
- SC.912.L.17.20: Interdependence Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.

- **PYRAMIDS OF ENERGY, NUMBERS, AND BIOMASS**

- SC.912.L.17.9: Interdependence Use a food web to identify and distinguish producers, consumers, and decomposers. Explain the pathway of energy transfer through trophic levels and the reduction of available energy at successive trophic levels.
- SC.912.L.17.5: Interdependence Analyze how population size is determined by births, deaths, immigration, emigration, and limiting factors (biotic and abiotic) that determine carrying capacity.
- SC.912.L.17.8: Interdependence Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species.
- SC.912.L.17.20: Interdependence Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.

### Unit 17: Ecology of Succession

- **SUCCESSION IN COMMUNITIES**

- SC.912.L.17.4: Interdependence Describe changes in ecosystems resulting from seasonal variations, climate change and succession.

- **NATURAL IMPACTS ON ECOSYSTEMS**

- SC.912.L.17.4: Interdependence Describe changes in ecosystems resulting from seasonal variations, climate change and succession.

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- SC.912.L.17.C: Interdependence Human activities and natural events can have profound effects on populations, biodiversity and ecosystem processes.
  - SC.912.L.17.8: Interdependence Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species.
  - SC.912.L.17.20: Interdependence Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.
  - SC.912.L.15.3: Diversity and Evolution of Living Organisms Describe how biological diversity is increased by the origin of new species and how it is decreased by the natural process of extinction.
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