


# High School - Biology

## North Boone CUSD 200

UNITS (7/7 SELECTED)

	SUGGESTED DURATION
 Unit 1: Nature of Life	<i>28 lessons</i>
 Unit 2: Cells and Energy	<i>45 lessons</i>
 Unit 3: Genetics	<i>35 lessons</i>
 Unit 4: Evolution	<i>20 lessons</i>
 Unit 5: Bacteria and Viruses	<i>10 lessons</i>
 Unit 6: Animals: Invertebrates	<i>11 lessons</i>
 Unit 7: Animals: Chordates	<i>11 lessons</i>

# Unit 1: Nature of Life

High School - Biology - Last Updated on March 21, 2019

## STANDARDS

**HS-LS1-1.:** Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

**HS-LS1-6.:** Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.

## PRIORITY STANDARDS

<b>HS-LS1-1</b>	Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.
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## DESIRED RESULTS

Enduring Understandings	Essential Question(s)
The process of science helps biologists investigate how nature works at all levels, from the molecules in cells to the biosphere.	What role does science play in the study of life?  What are the basic chemical principles that affect living things?

Students will know (Knowledge):	Students will be able to (Skills):
<ul style="list-style-type: none"><li>The processes of science provide natural explanations for events in the natural world and aims to use those explanations to understand patterns in nature and to make useful predictions about natural events</li><li>Living things: are made up of units called cells; are based on a universal genetic code; obtain and use materials and energy; grow and develop, reproduce; respond to their environment; maintain a stable internal environment; and change over time.</li><li>The subatomic particles that make up atoms are protons, neutrons, and electrons</li></ul>	<ul style="list-style-type: none"><li>Describe the steps used in scientific methodology, including: observing and asking questions, making inferences and forming hypotheses, safely conducting controlled experiments, collecting and analyzing data, and drawing conclusions</li><li>Identify an object as living or nonliving based on the characteristics of living things</li><li>Discuss the unique properties of water</li><li>Explain what acidic solutions and basic solutions are</li><li>Describe the structures and functions of proteins, lipids, nucleic acids, and carbohydrates</li><li>Explain why enzymes are important to living things</li><li>Perform lab activities safely</li><li>Identify control groups, independent/manipulated variables and dependent/responding variables</li></ul>

## Unit 2: Cells and Energy

High School - Biology - Last Updated on March 21, 2019

### STANDARDS

**HS-LS1-1.:** Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

**HS-LS1-4.:** Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.

**HS-LS1-5.:** Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.

**HS-LS1-7.:** Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.

**HS-LS3-1.:** Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

**HS-LS2-5.:** Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.

**HS-LS1-6.:** Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.

**HS-LS1-2.:** Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

**HS-LS1-3.:** Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

**HS-ETS1-1.:** Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

## Unit 2: Cells and Energy

High School - Biology - Last Updated on March 21, 2019

### PRIORITY STANDARDS

<b>HS-LS1-1</b>	Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.
<b>HS-LS1-4</b>	Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
<b>HS-LS1-5</b>	Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.
<b>HS-LS1-7</b>	Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.
<b>HS-LS3-1</b>	Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

## Unit 2: Cells and Energy

High School - Biology - Last Updated on March 21, 2019

### DESIRED RESULTS

Enduring Understandings	Essential Question(s)
<p>A cell is the basic unit of life; the processes that occur at the cellular level provide the energy and basic structure organisms need to survive</p>	<p>How are cell structures adapted to their functions?</p> <p>How do organisms obtain energy from the sun?</p> <p>How and why does a cell produce a new cell?</p>

Students will know (Knowledge):	Students will be able to (Skills):
<ul style="list-style-type: none"> <li>• The names and describe the functions of basic cell structures, including but not limited to: nucleus, vacuoles, lysosomes, organelles, cytoskeleton, proteins, Golgi apparatus, Chloroplasts, mitochondria, cell membrane</li> <li>• That according to the cell theory: all living things are made up of cells; cells are the basic units of structure and function in living things; and new cells are produced from existing cells</li> <li>• The phases of the cell cycle: prophase, metaphase, anaphase, telophase</li> </ul>	<ul style="list-style-type: none"> <li>• Explain the processes of diffusion, osmosis, facilitated diffusion, and active transport</li> <li>• Describe the levels of organization in multi-cellular organisms</li> <li>• Describe the role of ATP in cellular activities</li> <li>• Explain photosynthesis and identify factors that affect its rate</li> <li>• Explain cellular respiration, the two types of fermentation, and why fermentation is important for cells</li> <li>• Explain the pathways the body uses to release energy during exercise</li> <li>• Compare and contrast photosynthesis and cellular respiration, i.e., explain how cellular respiration and photosynthesis are dependent on one another</li> <li>• Design an experiment to test one factor that affects the rate of photosynthesis</li> <li>• Explain the problems caused by growth and how cell division solves these problems</li> <li>• Describe what happens during the cell cycle and mitosis</li> <li>• Explain how the cell cycle is regulated and what happens when the cell cycle is not controlled, i.e., how cancer cells are different from other cells</li> </ul>

## Unit 3: Genetics

High School - Biology - Last Updated on March 21, 2019

### STANDARDS

**HS-LS1-1.:** Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

**HS-LS1-4.:** Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.

**HS-LS3-1.:** Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

**HS-LS3-2.:** Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

**HS-LS3-3.:** Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

**HS-LS4-1.:** Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

**HS-LS4-3.:** Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.

**HS-LS1-6.:** Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.

**HS-ETS1-3.:** Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

## Unit 3: Genetics

High School - Biology - Last Updated on March 21, 2019

### PRIORITY STANDARDS

<b>HS-LS1-1</b>	Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.
<b>HS-LS3-1</b>	Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.
<b>HS-LS3-2</b>	Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.
<b>HS-LS3-3</b>	Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.
<b>HS-LS4-1</b>	Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

## Unit 3: Genetics

High School - Biology - Last Updated on March 21, 2019

### DESIRED RESULTS

Enduring Understandings	Essential Question(s)
DNA is the universal code for life; it enables an organism to transmit hereditary information and, along with the environment, determines an organism's characteristics	<p>How does cellular information pass from one generation to another?</p> <p>What is the structure of DNA, and how does it function in genetic inheritance?</p> <p>How does information flow from the cell nucleus to direct the synthesis of proteins in the cytoplasm?</p> <p>How can we use genetics to study human inheritance?</p>

Students will know (Knowledge):	Students will be able to (Skills):
<ul style="list-style-type: none"><li>• The principal of dominance and what inheritance patterns exist aside from it</li><li>• What happens during segregation</li><li>• The principal of independent assortment and what structures assort independently</li><li>• The relationship between genes and the environment</li><li>• The structure of DNA molecules and the relationship between DNA and genes</li><li>• Descriptions of gene mutations and chromosomal mutations</li><li>• The differences between autosomal inheritance and sex-linked inheritance</li><li>• Why sex-linked disorders are more common in males than females</li><li>• How small changes can lead to genetic disorders</li><li>• The definition of nondisjunction and the problems caused by it</li><li>• The goals of the Human Genome Project and what has been learned so far</li><li>• What gene therapy is</li></ul>	<ul style="list-style-type: none"><li>• Explain how Gregor Mendel studied inheritance and synthesize his conclusions</li><li>• Describe how geneticists use the principles of probability and how Punnett Squares are used</li><li>• Describe other inheritance patterns aside from simple dominance</li><li>• Explain the events of mitosis: contrast the chromosome number of body cells and gametes</li><li>• Summarize the events of meiosis</li><li>• Explain the events of mitosis and contrast the chromosome number of body cells and gametes</li><li>• Compare and contrast mitosis and meiosis</li><li>• Summarize the events of DNA replication</li><li>• Compare and contrast DNA and RNA, identifying the three main types of RNA</li><li>• Explain the process of transcription</li><li>• Summarize the process of translation</li><li>• Explain how eukaryotic genes are regulated</li><li>• Identify the types of human chromosomes in a karyotype and explain how sex is determined</li><li>• Explain how scientists and researchers are attempting to cure genetic disorders</li></ul>



## Unit 4: Evolution

High School - Biology - Last Updated on March 21, 2019

### STANDARDS

**HS-LS1-1.:** Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

**HS-LS3-1.:** Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

**HS-LS3-2.:** Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

**HS-LS3-3.:** Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

**HS-LS4-1.:** Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

**HS-LS4-2.:** Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.

**HS-LS4-4.:** Construct an explanation based on evidence for how natural selection leads to adaptation of populations.

**HS-LS2-6.:** Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.

**HS-LS2-8.:** Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.

**HS-LS4-5.:** Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

**HS-LS4-3.:** Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.

## Unit 4: Evolution

High School - Biology - Last Updated on March 21, 2019

### PRIORITY STANDARDS

<b>HS-LS1-1</b>	Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.
<b>HS-LS3-1</b>	Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.
<b>HS-LS3-2</b>	Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.
<b>HS-LS3-3</b>	Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.
<b>HS-LS4-1</b>	Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.
<b>HS-LS4-2</b>	Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.
<b>HS-LS4-4</b>	Construct an explanation based on evidence for how natural selection leads to adaptation of populations.

# Unit 4: Evolution

High School - Biology - Last Updated on March 21, 2019

## DESIRED RESULTS

Enduring Understandings	Essential Question(s)
The diversity of life is the result of ongoing evolutionary change. Species alive today have evolved from ancient common ancestors	What is natural selection?  How do fossils help us understand the history of life on Earth?  What is the goal of classifying living things?

Students will know (Knowledge):	Students will be able to (Skills):
<ul style="list-style-type: none"><li>• The patterns of biodiversity observed by Darwin among organisms of the Galapagos Islands</li><li>• The ideas that shaped Darwin's thinking including: conclusions drawn by Hutton and Lyell about Earth's history; Lamarck's hypothesis of how species evolve; and Malthus's view of population growth</li><li>• How natural (inherited) variation is used in artificial selection</li><li>• The relationship between natural selection and the fitness of a species</li><li>• The evidence of evolution that Darwin presented</li><li>• The differentiation between relative and radioactive dating</li><li>• The main divisions of the geologic time scale</li><li>• The make up of Earth's early atmosphere: carbon dioxide, water vapor, nitrogen; lesser amounts of carbon monoxide, hydrogen sulfide, and hydrogen cyanide; and little or no oxygen</li><li>• The experiments of Miller and Urey showed how mixtures of the organic compounds necessary for life could have arisen from simpler compounds on a primitive Earth</li><li>• When oxygen began to accumulate in the atmosphere: the ozone layer began to form and the skies turned blue; some early life forms were driven to</li></ul>	<ul style="list-style-type: none"><li>• Summarize Darwin's work, theories, and the evidence he used to support his ideas</li><li>• Describe the fossil record and the evidence it contains</li><li>• Explain how the conditions of early Earth differed from Earth's current conditions</li><li>• Identify and describe important patterns of macroevolution</li><li>• Explain how living things can be organized for study</li><li>• Describe the naming (binomial nomenclature) and classification systems developed by Linnaeus</li><li>• Explain how evolutionary relationships are important in classification and how it is possible to compare very dissimilar organisms</li><li>• Identify and describe the six kingdoms of life</li><li>• Explain the three domain system of classification</li></ul>

## Unit 4: Evolution

High School - Biology - Last Updated on March 21, 2019

Students will know (Knowledge):	Students will be able to (Skills):
<p>extinction; and some organisms developed new metabolic pathways that used oxygen for respiration</p> <ul style="list-style-type: none"><li>• The endosymbiotic theory proposes an explanation for the origin of eukaryotic cells.</li><li>• The characteristic forms of life in the Paleozoic, Mesozoic, and Cenozoic eras</li><li>• How evolutionary relationships are used in classification and how DNA and RNA can help determine evolutionary relationships</li></ul>	

# Unit 5: Bacteria and Viruses

High School - Biology - Last Updated on March 21, 2019

## STANDARDS

**HS-LS1-1.:** Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

**HS-LS2-8.:** Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.

**HS-ETS1-3.:** Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

**HS-LS4-5.:** Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

## PRIORITY STANDARDS

<b>HS-LS1-1</b>	Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.
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# Unit 5: Bacteria and Viruses

High School - Biology - Last Updated on March 21, 2019

## DESIRED RESULTS

Enduring Understandings	Essential Question(s)
From microorganisms to plants and animals, organisms vary widely in the way they carry out basic life processes.	Are all microbes that make us sick made of living cells?  Why are microbes important in the environment?

Students will know (Knowledge):	Students will be able to (Skills):
<ul style="list-style-type: none"><li>• Prokaryotes are classified as Bacteria or Archaea-two of the three domains of life</li><li>• Bacteria cause disease by destroying living cells or by releasing chemicals that upset homeostasis</li><li>• Methods of controlling bacteria include: physical removal, disinfectants, food storage, food processing, heat sterilization</li><li>• Viruses: vary widely in size and structure; have proteins on their surface membrane (capsid) that bind to receptor proteins on the host cell; once inside a host cell, express viral genes that may destroy the host cell</li></ul>	<ul style="list-style-type: none"><li>• Describe the factors that are used to classify prokaryotes</li><li>• Compare and contrast the two groups of prokaryotes</li><li>• Describe and explain the ecological roles that bacteria play in the environment: as decomposers, producers, and nitrogen fixers</li><li>• Describe the various ways bacteria cause disease or illness: direct destruction of living cells; causing tissue damage by provoking responses from the immune system; and releasing toxins that interfere with normal activity of the host</li><li>• Describe and explain various methods of controlling bacteria</li><li>• Describe and explain the structure and composition of a virus</li><li>• Explain how viruses can cause infection</li></ul>

## Unit 6: Animals: Invertebrates

High School - Biology - Last Updated on March 21, 2019

### STANDARDS

**HS-LS1-1.:** Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

**HS-LS1-7.:** Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.

**HS-LS4-1.:** Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

**HS-LS4-2.:** Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.

**HS-LS2-6.:** Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.

**HS-LS2-8.:** Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.

**HS-LS4-5.:** Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

**HS-LS1-2.:** Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

## Unit 6: Animals: Invertebrates

High School - Biology - Last Updated on March 21, 2019

### PRIORITY STANDARDS

<b>HS-LS1-1</b>	Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.
<b>HS-LS1-7</b>	Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.
<b>HS-LS4-1</b>	Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.
<b>HS-LS4-2</b>	Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.



# Unit 6: Animals: Invertebrates

High School - Biology - Last Updated on March 21, 2019

## DESIRED RESULTS

Enduring Understandings	Essential Question(s)
<p>Animals have developed diverse ways to carry out basic life processes and maintain homeostasis</p>	<p>What characteristics and traits define animals?</p> <p>How have animals developed and changed over time from earlier forms?</p> <p>How do the structure of animals allow them to obtain essential materials and eliminate wastes?</p> <p>How do the body systems of animals allow them to collect information about their environments and respond appropriately?</p>

Students will know (Knowledge):	Students will be able to (Skills):
<ul style="list-style-type: none"> <li>• The characteristics that all animals share and the essential functions they perform in order to survive</li> <li>• Why sponges are classified as animals</li> <li>• The two body plans of the life cycle of cnidarians</li> <li>• The three groups of cnidarians</li> <li>• The characteristics of the three groups of flatworms</li> <li>• How flatworms and roundworms can cause diseases</li> <li>• Which roundworms are important in human disease</li> <li>• The three classes of annelids</li> <li>• The basic body plan of mollusks</li> <li>• The characteristics of the three main classes of mollusks</li> <li>• How arthropods grow and develop</li> <li>• Important trends in animal development and change over time</li> </ul>	<ul style="list-style-type: none"> <li>• Explain what each of the following animals is and how it carries out essential functions:               <ul style="list-style-type: none"> <li>◦ Sponges</li> <li>◦ Cnidarians</li> </ul> </li> <li>• Describe the defining features of the following animals:               <ul style="list-style-type: none"> <li>◦ Flatworms</li> <li>◦ Roundworms</li> <li>◦ Annelids</li> <li>◦ Mollusks</li> <li>◦ Arthropods</li> <li>◦ Insects</li> </ul> </li> <li>• Describe how earthworms are important in the environment</li> <li>• Identify the defining and/or distinguishing features of arthropods, insects, and echinoderms</li> <li>• Describe the two types of development in insects</li> </ul>

## Unit 7: Animals: Chordates

High School - Biology - Last Updated on March 21, 2019

### STANDARDS

**HS-LS1-1.:** Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

**HS-LS1-2.:** Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

**HS-LS4-1.:** Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

**HS-LS4-4.:** Construct an explanation based on evidence for how natural selection leads to adaptation of populations.

### PRIORITY STANDARDS

<b>HS-LS1-1</b>	Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.
<b>HS-LS4-1</b>	Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.
<b>HS-LS4-4</b>	Construct an explanation based on evidence for how natural selection leads to adaptation of populations.

# Unit 7: Animals: Chordates

High School - Biology - Last Updated on March 21, 2019

## DESIRED RESULTS

Enduring Understandings	Essential Question(s)
Animals have developed diverse ways to carry out basic life processes and maintain homeostasis	What characteristics and traits define animals?  How have animals developed and changed over time from earlier forms?  How do the structure of animals allow them to obtain essential materials and eliminate wastes?  How do the body systems of animals allow them to collect information about their environments and respond appropriately?

Students will know (Knowledge):	Students will be able to (Skills):
<ul style="list-style-type: none"><li>• The characteristics share by all:<ul style="list-style-type: none"><li>◦ Chordates</li><li>◦ Mammals</li><li>◦ Primates</li></ul></li><li>• The difference between nonvertebrate chordates and vertebrates</li><li>• How mammals perform essential life functions</li></ul>	<ul style="list-style-type: none"><li>• Describe the basic characteristics of the following animals:<ul style="list-style-type: none"><li>◦ Fish</li><li>◦ Amphibians</li><li>◦ Reptiles</li><li>◦ Birds</li><li>◦ Mammals</li></ul></li><li>• Describe how fish are adapted for life in water</li><li>• Describe the adaptations amphibians possess that allow them to be successful both in water and on land</li><li>• Describe how reptiles are adapted to life on land</li><li>• Describe how birds are adapted flight</li><li>• Differentiate the three groups of living mammals</li></ul>