

Nashoba Regional School District

**SCIENCE AND  
TECHNOLOGY/  
ENGINEERING**

**Standards and Benchmarks  
Grade 7  
Life Science**



---

NRSD Science and Technology/Engineering Standards and Benchmarks, 2006-2007.

Work in this document is based upon the standards outlined in the Massachusetts Science and Technology/Engineering Curriculum Framework, 2001.

**Science and Technology/Engineering by Grade Level  
Grade: 7 – Life Science  
Standards and Benchmarks**

**LIFE SCIENCE STRAND**

**UNIT: Classification**

Grade 7 students will demonstrate **MASTERY** of the following learning standards:

**Learning Standard LS 1**

Classify organisms into the currently recognized kingdoms according to characteristics that they share. Be familiar with organisms from each kingdom.

**Big Idea:**

All living things can be placed into well-organized groups based upon common structures, functions and advances in adaptations.

**Essential Questions:**

- How and why do we classify the organisms around us?
- What characteristics do all living things share?
- What are the needs of all living things?

**Coverage Timeline**

- It is recommended that this unit take 2 weeks of study, but remain flexible, based upon resources, student interest, and corresponding opportunities.

**Outcomes, Learning Experiences and Assessments**

Student Outcomes	Teaching Strategies / Materials	Student Assessment	Standard
<p><b>Characteristics of Living Things</b></p> <ul style="list-style-type: none"> <li>• List the characteristics and need of living things.</li> <li>• Defend/justify why something is alive or not.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook</li> <li>• Lecture, PPT/Integrated Technology</li> <li>• Guided Reading /textbook</li> <li>• Classroom simulation/“The Martian and the Car” or “Robots are Alive”</li> <li>• Group investigation / “Is it alive?” laboratory</li> </ul>	<ul style="list-style-type: none"> <li>• Defend characteristics of life in simulation</li> <li>• Quiz</li> <li>• End of Unit test</li> </ul>	<p>LS 1 (M)</p>

**UNIT: Classification - continued**

Student Outcomes	Teaching Strategies / Materials	Student Assessment	Standards
<p><b>Classification</b></p> <ul style="list-style-type: none"> <li>• Identify contributions made toward classification: (i.e. earliest/Aristotle, taxonomy/Linnaeus, common ancestor/Darwin, DNA mapping/current).</li> <li>• Make and use taxonomic key.</li> <li>• Identify eight levels of classification (Domain to Species).</li> <li>• Understand and use binomial nomenclature/scientific name.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction /textbook</li> <li>• Lecture, PPT/Integrated Technology</li> <li>• Group Discussion/sorting strategies (supermarket, CD store)</li> <li>• Group investigation/sorting activity (desk drawer, lab objects, hardware)</li> <li>• Group investigation/ Taxonomic key (norns, beans, animal pictures)</li> <li>• Group discussion/levels of classification (owls, addresses)</li> <li>• Independent practice/create and illustrate mnemonic device for KPCOFGS</li> <li>• Independent practice – binomial nomenclature</li> </ul>	<ul style="list-style-type: none"> <li>• Make and use a taxonomic key</li> <li>• Visual products – mnemonics</li> <li>• Lab reports</li> <li>• Quiz</li> <li>• End of Unit test</li> </ul>	<p>LS 1 (M)</p>
<p><b>Domains &amp; Kingdoms</b></p> <ul style="list-style-type: none"> <li>• Name and briefly describe the three domains and kingdoms of living things.</li> <li>• List characteristics common to each domain and/or kingdom (Pro/Eukaryotic, Uni/Multicellular, Auto/Heterotroph, Asexual/Sexual)</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction /textbook</li> <li>• Lecture, PPT/Integrated Technology</li> <li>• Independent practice/fill in kingdom chart</li> <li>• Group discussion/Kingdom Chart</li> </ul>	<ul style="list-style-type: none"> <li>• Kingdom Chart</li> <li>• Quiz</li> <li>• End of Unit test</li> </ul>	<p>LS 1 (M)</p>

## **LIFE SCIENCE STRAND**

### **UNIT: Cells**

Grade 7 students will demonstrate **MASTERY** of the following learning standards:

#### **Learning Standard LS 2**

Recognize that all organisms are composed of cells, and that many organisms are single-celled (unicellular), e.g., bacteria, yeast. In these single-celled organisms, one cell must carry out all of the basic functions of life.

#### **Learning Standard LS 3**

Compare and contrast plant and animal cells, including major organelles (cell membrane, cell wall, nucleus, cytoplasm, chloroplasts, mitochondria, vacuoles).

#### **Learning Standard LS 4**

Recognize that within cells, many of the basic functions of organisms (e.g., extracting energy from food and getting rid of waste) are carried out. The way in which cells function, is similar in all living organisms.

#### **Learning Standard LS 5**

Describe the hierarchical organization of multi-cellular organisms from cells to tissues to organs to systems to organisms.

#### **Learning Standard LS 9**

Compare sexual reproduction (offspring inherit half of their genes from each parent) with asexual reproduction (offspring is an identical copy of the parent's cell).

#### **Learning Standard LS 16**

Recognize that producers (plants that contain chlorophyll) use the energy from sunlight to make sugars from carbon dioxide and water through a process called photosynthesis. This food can be used immediately, stored for later use, or used by other organisms.

#### **Big Idea:**

Cells are the basic unit of structure and function in all living things.

#### **Essential Questions:**

How did the invention of the microscope contribute to the scientists understanding of living things?

How do cells carry out all the functions of living things?

How do the forms of plant and animal cells impact their functions?

#### **Coverage Timeline**

- It is recommended that this unit take 3-4 weeks of study, but remain flexible, based upon resources, student interest, and corresponding opportunities.

**UNIT: Cells - continued**

**Outcomes, Learning Experiences and Assessments**

Student Outcomes	Teaching Strategies / Materials	Student Assessment	Standards
<p><b>Microscope</b></p> <ul style="list-style-type: none"> <li>• Describe and label parts of scope.</li> <li>• Prepare wet mount.</li> <li>• Determine total magnification.</li> <li>• Draw and label field of view.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook Laboratory demonstration/ microscopes, slides, cover slips, wet mount materials</li> <li>• Guided Practice/viewing prepared slides</li> <li>• Independent practice/teacher prepared worksheets</li> </ul>	<ul style="list-style-type: none"> <li>• Lab Report parts and function of scope, wet mount drawing, total magnification determination</li> <li>• Quiz</li> </ul>	<p>LS 2 (M)</p>
<p><b>Cell Theory</b></p> <ul style="list-style-type: none"> <li>• Identify key figures who made contributions to cell discovery (Hooke, van Leuwenhoek).</li> <li>• State three parts of cell theory.</li> <li>• Identify scientists who led to the discovery of the cell theory (Schwann, Schleiden, Virchow).</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook</li> <li>• Lecture, PPT/Integrated Technology</li> <li>• Group discussion</li> <li>• Independent practice/worksheets</li> </ul>	<ul style="list-style-type: none"> <li>• Timeline</li> <li>• Quiz</li> <li>• End of Unit test</li> </ul>	<p>LS 2 (M)</p>
<p><b>Cell Anatomy and Physiology</b></p> <ul style="list-style-type: none"> <li>• Compare and contrast plant &amp; animal cells.</li> <li>• Identify basic organelles – structure and function (cell wall, membrane, nucleus (membrane, nucleolus), cytoplasm, mitochondria, chloroplast, vacuole, ER, Golgi Body, ribosome, and lysosome.</li> <li>• Compare and contrast prokaryotic and eukaryotic cells.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook</li> <li>• Lecture PPT/Integrated Technology</li> <li>• Laboratory demonstration/animal &amp; plant cells (cheek &amp; elodea)</li> <li>• Cooperative learning/cell modeling</li> <li>• Differentiated Instruction/story, book, picture</li> <li>• Independent learning/Cell is like a ....</li> <li>• Guided practice/Scientific drawing</li> <li>• Guided practice/Venn Diagram compare and contrast</li> </ul>	<ul style="list-style-type: none"> <li>• Laboratory report</li> <li>• Cell models</li> <li>• Cell Product (story, book, picture)</li> <li>• Diagrams</li> <li>• Quiz</li> <li>End of Unit test</li> </ul>	<p>LS 2 (M) LS 3 (M) LS 4 (M) LS 5 (M)</p>

**UNIT: Cells – continued**

Student Outcomes	Teaching Strategies / Materials	Student Assessment	Standards
<p><b>Cell Processes</b></p> <ul style="list-style-type: none"> <li>• Describe the process of respiration and photosynthesis.</li> <li>• Describe how respiration and photosynthesis are related.</li> <li>• Write the chemical equations for each process.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction/textbook</li> <li>• Integrated technology/PPT, Video, DVD</li> <li>• Independent practice/worksheets</li> <li>• Cooperative learning/respiration/photo</li> <li>• Descriptive writing/compare contrast paragraphs</li> </ul>	<ul style="list-style-type: none"> <li>• Models/drawings</li> <li>• Quiz</li> <li>• End of Unit Test</li> </ul>	<p>LS 4 (M) LS 16 (M)</p>
<p><b>Cell Division</b></p> <ul style="list-style-type: none"> <li>• Describe the events that occur during cell cycle.</li> <li>• Interphase</li> <li>• Mitosis</li> <li>• Cytokinesis</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook</li> <li>• Integrated technology/PPT, Video, DVD</li> <li>• Independent practice/worksheets</li> <li>• Independent practice/claymation</li> <li>• Group investigation/sock mitosis</li> </ul>	<ul style="list-style-type: none"> <li>• Models/drawings</li> <li>• Quiz</li> <li>• End of Unit Test</li> </ul>	<p>LS 9 (M)</p>
<p><b>Cellular Transport</b></p> <ul style="list-style-type: none"> <li>• Describe how the cell uses the 2 types of cellular transport (passive and active).</li> <li>• Compare and contrast diffusion, osmosis, active transport and engulfing.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/ textbook</li> <li>• Integrated technology/lecture, PPT</li> <li>• Laboratory demonstration (egg)</li> <li>• Guided practice/Venn Diagram</li> </ul>	<ul style="list-style-type: none"> <li>• Lab reports</li> <li>• Diagrams</li> <li>• Quiz</li> <li>• End of Unit test</li> </ul>	<p>LS 4 (M)</p>

## **LIFE SCIENCE STRAND**

### **UNIT: Virus, Bacteria, Disease**

Grade 7 students will demonstrate **MASTERY** of the following learning standards:

#### **Learning Standard LS 1**

Classify organisms into the currently recognized kingdoms according to characteristics that they share. Be familiar with organisms from each kingdom.

#### **Learning Standard LS 2**

Recognize that all organisms are composed of cells, and that many organisms are single-celled (unicellular), e.g., bacteria, yeast. In these single-celled organisms, one cell must carry out all of the basic functions of life.

#### **Learning Standard LS 4**

Recognize that within cells, many of the basic functions of organisms (e.g., extracting energy from food and getting rid of waste) are carried out. The way in which cells function, is similar in all living organisms.

#### **Learning Standard LS 6**

Identify the general functions of the major systems of the human body (digestion, respiration, reproduction, circulation, excretion, protection from disease, and movement, control, and coordination) and describe ways that these systems interact with each other

#### **Learning Standard LS 9**

Compare sexual reproduction (offspring inherit half of their genes from each parent) with asexual reproduction (offspring is an identical copy of the parent's cell).

#### **Learning Standard LS 10**

Give examples of ways in which genetic variation and environmental factors are causes of evolution and the diversity of organisms.

#### **Learning Standard LS 14**

Explain the roles and relationships among producers, consumers, and decomposers in the process of energy transfer in a food web.

#### **Learning Standard LS 15**

Explain how dead plants and animals are broken down by other living organisms and how this process contributes to the system as a whole.

#### **Learning Standard LS 18**

Recognize that biological evolution accounts for the diversity of species developed through gradual processes over many generations.

#### **Big Idea:**

Life can be impacted both positively and negatively by viruses and prokaryotes.

#### **Essential Questions:**

How do viruses function if they are non-living things?

How are the structures of viruses and prokaryotes adapted to enable them to function?

How has the knowledge of viruses and bacteria aided the fight against disease?

## UNIT: Virus, Bacteria, Disease - continued

### Coverage Timeline

- It is recommended that this unit take 3 weeks of study, but remain flexible, based upon resources, student interest, and corresponding opportunities.

### Outcomes, Learning Experiences and Assessments

Student Outcomes	Teaching Strategies / Materials	Student Assessment	Standards
<p><b>Virus/Bacteria</b></p> <ul style="list-style-type: none"> <li>• Describe basic viral and prokaryotic structure.</li> <li>• Compare and contrast viral, prokaryotic, animal, and plant cells: structure, organelles and function.</li> <li>• Describe viral reproduction (hidden and active)</li> <li>• Describe prokaryotic reproduction (binary fission and conjugation)</li> <li>• Describe the role bacteria play in decomposition</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction/textbook and Videos</li> <li>• Classroom simulations - disease transmission</li> <li>• Guided practice/Venn Diagram or foldables for viral, bacterial, animal and plant cells</li> <li>• Independent practice flipbook, model, drawing</li> <li>• Laboratory investigations/ bacteria growth lab</li> <li>• Integrated technology Videos, PPT</li> </ul>	<ul style="list-style-type: none"> <li>• Venn diagram or foldable completion</li> <li>• Independent project completion: flipbook, model, drawing</li> <li>• Lab report</li> <li>• Quiz</li> <li>• End of Unit test</li> </ul>	LS 1 (M) LS 2 (M) LS 4 (M) LS 9 (M) LS 10 (M) LS 14 (M) LS 15 (M) LS 18 (M)
<p><b>Disease</b></p> <ul style="list-style-type: none"> <li>• Describe the role viruses and bacteria play in causing diseases.</li> <li>• Understand how good hygiene practices help to minimize the outbreak of disease.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook</li> <li>• Independent practice- Reports and surveys</li> <li>• Integrated technology Videos, PPT</li> <li>• Cooperative learning - Disease Research Project</li> </ul>	<ul style="list-style-type: none"> <li>• Quiz</li> <li>• End of Unit test</li> <li>• Research project completion</li> </ul>	LS 6 (M)

## **LIFE SCIENCE STRAND**

### **UNIT: Organization of the Eukarya domain**

Grade 7 students will demonstrate **MASTERY** of the following learning standards:

#### **Learning Standard LS 1**

Classify organisms into the currently recognized kingdoms according to characteristics that they share. Be familiar with organisms from each kingdom.

#### **Learning Standard LS 2**

Recognize that all organisms are composed of cells, and that many organisms are single-celled (unicellular), (e.g., bacteria, yeast). In these single-celled organisms, one cell must carry out all of the basic functions of life.

#### **Learning Standard LS 3**

Compare and contrast plant and animal cells, including major organelles (cell membrane, cell wall, nucleus, cytoplasm, chloroplasts, mitochondria, vacuoles).

#### **Learning Standard LS 4**

Recognize that within cells, many of the basic functions of organisms (e.g., extracting energy from food and getting rid of waste) are carried out. The way in which cells function, is similar in all living organisms.

#### **Learning Standard LS 5**

Describe the hierarchical organization of multicellular organisms from cells to tissues to organs to systems to organisms.

#### **Learning Standard LS 9**

Compare sexual reproduction (offspring inherit half of their genes from each parent) with asexual reproduction (offspring is an identical copy of the parent's cell).

#### **Learning Standard LS 10**

Give examples of ways in which genetic variation and environmental factors are causes of evolution and the diversity of organisms.

#### **Learning Standard LS 11**

Recognize that evidence drawn from geology, fossils, and comparative anatomy provides the basis of the theory of evolution<sup>1</sup>

#### **Learning Standard LS 13**

Give examples of ways in which organisms interact and have different functions within an ecosystem that enable the ecosystem to survive.

#### **Learning Standard LS 14**

Explain the roles and relationships among producers, consumers, and decomposers in the process of energy transfer in a food web.

#### **Learning Standard LS 15**

Explain how dead plants and animals are broken down by other living organisms and how this process contributes to the system as a whole.

#### **Learning Standard LS 16**

Recognize that producers (plants that contain chlorophyll) use the energy from sunlight to make sugars from carbon dioxide and water through a process called photosynthesis. This food can be used immediately, stored for later use, or used by other organisms.

**UNIT: Organization of the Eukarya domain – Continued**

**Learning Standard LS 18**

Recognize that biological evolution accounts for the diversity of species developed through gradual processes over many generations.

<sup>1</sup>Please note that standard LS 11 has been “unpacked”. Comparative anatomy and the theory of evolution are to be address at Grade 7; Geology and fossils are to be addressed at Grade 6

**Big Idea:**

The Eukarya domain is grouped into well organized kingdoms based upon common structures, functions and advances in adaptations.

**Essential Questions:**

- What characteristics would you use to identify the kingdom of an unknown organism?
- How do structure and adaptations of organisms help them to survive?
- Why is there so much diversity amongst living things?
- What are the life cycles of living things?

**Coverage Timeline**

- It is recommended that you allow for flexibility based on resources, student interest, and corresponding opportunities.

**Topic: Protists**

**Timeline: 1 week**

**Outcomes, Learning Experiences and Assessments**

Student Outcomes	Teaching Strategies / Materials	Student Assessment	Standards
<p><b>Protists</b></p> <ul style="list-style-type: none"> <li>• Describe characteristics of animal like, plant like, fungi-like protist.</li> <li>• Give examples of protist kingdom: (ameba, paramecium, euglena, spirogyra).</li> <li>• Explain the evolutionary advantage protists have over previous organisms.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook</li> <li>• Integrated technology/PPT, Video, DVD</li> <li>• Independent practice/ listing characteristics of protists (Ameba, paramecium, slime mold, euglena)</li> <li>• Laboratory investigations protist lab (live / prepared)</li> <li>• Guided practice/draw &amp; give observations on characteristics of protist</li> <li>• Group investigation/based on observations-identify protist (Ameba, paramecium, euglena)</li> <li>• Laboratory investigations slime mold lab</li> </ul>	<ul style="list-style-type: none"> <li>• Lab report</li> <li>• Worksheet completion</li> <li>• Drawing and correctly identifying protists</li> <li>• Quiz &amp; tests</li> </ul>	<p>LS 1 (M) LS 2 (M) LS 3 (M) LS 4 (M) LS10 (M) LS 18 (M)</p>

**Topic: Fungi**  
**Timeline: 1 week**

**Outcomes, Learning Experiences and Assessments**

Student Outcomes	Teaching Strategies / Materials	Student Assessment	Standards
<p><b>Fungi</b></p> <ul style="list-style-type: none"> <li>• Describe basic characteristics of Fungi (heterotroph, no movement).</li> <li>• Identify examples from the fungi kingdom (yeast, mold, mushroom).</li> <li>• Understand the role of fungi in an ecosystem and how that role helps the ecosystem to survive</li> <li>• Describe how Fungi get their food</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook &amp; Videos</li> <li>• Integrated technology/PPT</li> <li>• Guided Practice/Venn Diagram or foldables</li> <li>• Laboratory investigations/ mushroom observation with microscope</li> <li>• Laboratory investigations/ What's for lunch – yeast lab</li> <li>• Cooperative learning/fungi simulation</li> </ul>	<ul style="list-style-type: none"> <li>• Venn diagram or “foldable”</li> <li>• Lab report</li> <li>• Quiz</li> </ul>	LS 1 (M) LS 2 (M) LS 5 (M) LS 9 (M) LS 10 (M) LS 13 (M) LS 14 (M) LS 15 (M)

**Topic: Plants**

**Timeline: 5-6 week**

**Outcomes, Learning Experiences and Assessments**

Student Outcomes	Teaching Strategies / Materials	Student Assessment	Standards
<p><b>What is a plant</b></p> <ul style="list-style-type: none"> <li>• Describe 4 common characteristics of the plant kingdom (multicellular, autotroph, sexual reproduction, cell wall)</li> <li>• Describe adaptations of plants for survival (i.e. vascular tissue, cuticle, long roots, unique reproduction methods)</li> <li>• Explain the evolutionary advantages plants have over previous organisms (all are multicellular &amp; autotrophic)</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction/textbook &amp; Videos</li> <li>• Integrated Technology/PPT</li> </ul>	<ul style="list-style-type: none"> <li>• Quiz</li> <li>• End of Unit test</li> </ul>	<p>LS 1 (M) LS 18 (M)</p>
<p><b>Plants</b></p> <ul style="list-style-type: none"> <li>• Describe and diagram general plant life cycle (sporophyte/gametophyte).</li> <li>• Compare and contrast:               <ul style="list-style-type: none"> <li>• Nonvascular/vascular</li> <li>• Spore/seed</li> <li>• Gymnosperm/angiosperm</li> <li>• Monocot/dicot</li> </ul> </li> <li>• Give examples from each major group of plants (moss, fern, conifer, flowering plants)</li> <li>• Differentiate between fertilization, germination, pollination.</li> <li>• Identify key structures and their function (rhizoids, capsule, fronds, spores, leaves, stems, roots, seeds, cones, flowers).</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction/textbook</li> <li>• Integrated technology /PPT, Video, DVD</li> <li>• Guided practice/Venn Diagrams or foldables: compare &amp; contrast</li> <li>• Independent practice/worksheets</li> <li>• Laboratory Investigations plant/flower dissection</li> <li>• Laboratory Investigations seed/bean dissection &amp; germination</li> <li>• Guided practice/plant part identification</li> <li>• Group investigations leaf/bean Taxonomic Key</li> <li>• Cooperative learning group project – plant games, iMovies</li> </ul>	<ul style="list-style-type: none"> <li>• Lab report</li> <li>• Taxonomic keys</li> <li>• Worksheet completion</li> <li>• Drawings</li> <li>• Group projects</li> <li>• Quiz</li> <li>• End of Unit test</li> </ul>	<p>LS 1 (M) LS 2 (M) LS 3 (M) LS 5 (M) LS 9 (M) LS 10 (M) LS 16 (M)</p>

**Topic: Animals****Timeline: 5-6 weeks****Outcomes, Learning Experiences and Assessments**

Student Outcomes	Teaching Strategies / Materials	Student Assessment	Standards
<p><b>What is an animal</b></p> <ul style="list-style-type: none"> <li>• Explain four common characteristics of animals (heterotroph, multicellular, movement, sexual reproduction).</li> <li>• Explain how animals have adapted for survival.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction /textbook and Videos</li> <li>• Integrated Technology/PPT</li> </ul>	<ul style="list-style-type: none"> <li>• Quiz</li> </ul>	LS 1 (M) LS 2 (M) LS 3 (M) LS 10 (M)
<p><b>Simple Invertebrates: Porifera/Cnidarians Platyhelminthes/Nematoda</b></p> <ul style="list-style-type: none"> <li>• Identify Evolutionary sequence for each phylum:               <ul style="list-style-type: none"> <li>• Porifera - First animal</li> <li>• Cnidarian - tissues (muscles for movement, sac digestive system, nerve net)</li> <li>• Platyhelminthes - head/ tail/simple brain</li> <li>• Nematoda – one way digestion</li> </ul> </li> <li>• Compare body structure of each phylum.</li> <li>• Identify the main characteristics of each phylum.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook</li> <li>• Integrated technology/PPT, Video, DVD</li> <li>• Independent practice/ worksheets</li> <li>• Guided practice/animal phylum booklet</li> <li>• Laboratory investigations planaria regeneration lab or hydra observation</li> <li>• Group investigation/Animal of the Eon project</li> </ul>	<ul style="list-style-type: none"> <li>• Lab reports</li> <li>• Worksheet completion</li> <li>• Group projects</li> <li>• Completed booklet</li> <li>• Quiz</li> </ul>	LS 1 (M) LS 10 (M) LS 11 (M) LS 18 (M)

**Topic: Animals – continued**

Student Outcomes	Teaching Strategies / Materials	Student Assessment	Standard
<p><b>Complex Invertebrates: Annelids, Mollusks, Arthropods, Echinoderms</b></p> <ul style="list-style-type: none"> <li>• Identify characteristics &amp; give examples from each phylum.</li> <li>• Identify Evolutionary sequence for each phylum:               <ul style="list-style-type: none"> <li>• Annelida – closed circulatory system, nephridia</li> <li>• Mollusks-mantle, kidneys, gills</li> <li>• Arthropods-jointed appendages, exoskeleton, segmented body</li> <li>• Echinoderm-endoskeleton &amp; internal vascular system</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook</li> <li>• Integrated technology/PPT, Video, DVD</li> <li>• Independent practice worksheets</li> <li>• Guided practice/Animal Phylum Booklet</li> <li>• Laboratory investigations earthworm response</li> <li>• Laboratory investigations earthworm dissection lab</li> <li>• Laboratory Investigations Snails pace</li> <li>• Laboratory Investigations grasshopper, squid, crayfish dissection lab</li> </ul>	<ul style="list-style-type: none"> <li>• Lab reports</li> <li>• Quiz</li> <li>• End of unit test</li> </ul>	LS 1 (M) LS 10 (M) LS 11 (M) LS 18 (M)
<p><b>Vertebrates:</b></p> <ul style="list-style-type: none"> <li>• Identify characteristics &amp; give examples from each class.</li> <li>• Compare &amp; contrast               <ul style="list-style-type: none"> <li>• Invert. to vertebrates.</li> <li>• Endo to ectotherm</li> </ul> </li> <li>• Identify evolutionary sequence for each phylum.               <ul style="list-style-type: none"> <li>• Fish-jawless, cartilage, bone</li> <li>• Amphibians-out of water, lungs, double loop circulation</li> <li>• Reptiles – conserve water, eggs out of water</li> <li>• Birds – 4 chambered heart, flight</li> <li>• Mammals – large brain</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook</li> <li>• Integrated Technology/PPT, Video, DVD</li> <li>• Independent practice/ worksheets</li> <li>• Guided practice/Animal Phylum Booklet</li> <li>• Investigations/frog, fish dissection lab</li> <li>• Group investigation/Virtual Zoo</li> </ul>	<ul style="list-style-type: none"> <li>• Lab Reports</li> <li>• Worksheet completion</li> <li>• Group projects</li> <li>• Completed booklet</li> <li>• Quiz</li> </ul>	LS 1 (M) LS 10 (M) LS 11 (M) LS 18 (M)

## **LIFE SCIENCE STRAND**

### **UNIT: Ecology**

Grade 7 students will demonstrate **MASTERY** of the following learning standards:

#### **Learning Standard LS 12**

Relate the extinction of species to a mismatch of adaptation and the environment.

#### **Learning Standard LS 13**

Give examples of ways in which organisms interact and have different functions within an ecosystem that enable the ecosystem to survive.

#### **Learning Standard LS 14**

Explain the roles and relationships among producers, consumers, and decomposers in the process of energy transfer in a food web.

#### **Learning Standard LS 15**

Explain how dead plants and animals are broken down by other living organisms and how this process contributes to the system as a whole.

#### **Learning Standard LS17**

Identify ways in which ecosystems have changed throughout geologic time in response to physical conditions, interactions among organisms, and the actions of humans. Describe how changes maybe catastrophes such as volcanic eruptions or ice storms<sup>1</sup>

#### **Big Ideas:**

All organisms come from other organisms which over time, have been changed by environmental pressures.

Organisms sharing the same ecosystem rely on each other to keep their ecosystem healthy and in balance.

#### **Essential Question:**

Can organisms survive by themselves or do they need to interact with other organisms?

#### **Coverage Timeline**

- It is recommended that you allow <1 week, but remain flexible, based on resources, student interest, and corresponding opportunities.

## UNIT: Ecology - continued

### Outcomes, Learning Experiences and Assessments

Student Outcomes	Teaching Strategies / Materials	Student Assessment	Standards
<p><b>Ecology</b></p> <ul style="list-style-type: none"><li>• Explain the relationship between producers, consumers, and decomposers.</li><li>• Explain the connection between food chains and food webs</li><li>• Explains the effects on an ecosystem caused by a change (i.e. physical, environmental, human)</li><li>• What factors can lead to the extinction of an organism</li></ul>	<ul style="list-style-type: none"><li>• Direct instruction</li><li>• Discovery Ecology Booklet</li><li>• Guided practice – create a food web/chain</li><li>• Case study of impacted ecosystem (ie. Wolves in Yellowstone, kudzu in southeast, zebra mussels in Great lakes)</li></ul>	<ul style="list-style-type: none"><li>• Quiz</li><li>• End of unit test</li><li>• Student project</li></ul>	LS 12 (M) LS 13 (M) LS 14 (M) LS 15 (M) LS 17 (M)

## **LIFE SCIENCE STRAND**

### **UNIT: Human Structure and Function**

Grade 7 students will demonstrate **MASTERY** of the following learning standards:

#### **Learning Standard LS 4**

Recognize that within cells, many of the basic functions of organisms (e.g., extracting energy from food and getting rid of waste) are carried out. The way in which cells function, is similar in all living organisms.

#### **Learning Standard LS 5**

Describe the hierarchical organization of multicellular organisms from cells to tissues to organs to systems to organisms.

#### **Learning Standard LS 6**

Identify the general functions of the major systems of the human body (digestion, respiration, reproduction, circulation, excretion, protection from disease, and movement, control, and coordination) and describe ways that these systems interact with each other

#### **Learning Standard LS 7**

Recognize that every organism requires a set of instructions that specifies its traits. These instructions are stored in the organism's chromosomes. Heredity is the passage of these instructions from one generation to another.

#### **Learning Standard LS 8**

Recognize that hereditary information is contained in genes located in the chromosomes of each cell. A human cell contains about 30,000 different genes on 23 different chromosomes.

#### **Learning Standard LS 9**

Compare sexual reproduction (offspring inherit half of their genes from each parent) with asexual reproduction (offspring is an identical copy of the parent's cell).

#### **Learning Standard LS 10**

Give examples of ways in which genetic variation and environmental factors are causes of evolution and the diversity of organisms.

#### **Big Idea:**

There is a structure of systems that works together to support the functions of the human body.

#### **Essential Questions**

How is each organ system designed to carry out a specific function within the human body?

How do organ systems work together to carry out life functions?

Why is there so much diversity within the human race?

#### **Coverage Timeline**

- It is recommended that you allow for flexibility based on resources, student interest, and corresponding opportunities.

**Topic: Human Body**  
**Timeline: 5-6 weeks**

**Outcomes, Learning Experiences and Assessments**

Student Outcomes	Teaching Strategies / Materials	Student Assessment	Standards
<p><b>General Human Body</b></p> <ul style="list-style-type: none"> <li>• Identify the levels of organization of the human body (cells, tissues, organs, organ systems, organism).</li> <li>• Compare the four types of tissues (epithelial, connective, nervous, muscle).</li> <li>• Integrate the functions of the major body systems.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook</li> <li>• Integrated Technology/PPT, Video, DVD</li> <li>• Independent practice worksheets</li> <li>• Laboratory investigation Frog dissection as review of all systems</li> </ul>	<ul style="list-style-type: none"> <li>• Quiz</li> <li>• Test</li> <li>• PPT presentation</li> <li>• Laboratory report</li> </ul>	<p>LS 5 (M) LS 6 (M)</p>
<p><b>Bones &amp; Muscles</b></p> <ul style="list-style-type: none"> <li>• Identify major bones and muscles.</li> <li>• Identify three types of muscles and their function.</li> <li>• Explain function of skeletal and muscular systems and how they interact.</li> <li>• Explain the role moveable joints play.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook</li> <li>• Integrated Technology/PPT, Video, DVD</li> <li>• Independent practice worksheets</li> <li>• Group investigation joint modeling</li> <li>• Laboratory investigation chicken wing dissection</li> <li>• Group investigation assemble Billy bones</li> </ul>	<ul style="list-style-type: none"> <li>• Quiz</li> <li>• Test</li> <li>• PPT presentation</li> <li>• Laboratory report</li> </ul>	<p>LS 6 (M)</p>
<p><b>Digestion</b></p> <ul style="list-style-type: none"> <li>• Identify major organs and their functions.</li> <li>• Trace the path of food through the digestive system.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook</li> <li>• Integrated Technology/PPT, Video, DVD</li> <li>• Laboratory investigation</li> <li>• Independent practice digestive ws activities</li> </ul>	<ul style="list-style-type: none"> <li>• Quiz</li> <li>• Test</li> <li>• PPT presentation</li> <li>• Laboratory report</li> </ul>	<p>LS 6 (M)</p>

**Topic: Human Body – continued...**

**Outcomes, Learning Experiences and Assessments**

Student Outcomes	Teaching Strategies / Materials	Student Assessment	Standards
<p><b>Circulatory, Respiration &amp; Urinary</b></p> <ul style="list-style-type: none"> <li>• Describe functions of these systems.</li> <li>• Explain the structure and function of major organs in these systems.</li> <li>• Trace the pathway of a drop of blood through the cardiopulmonary system.</li> <li>• Name and describe the four components of blood.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook</li> <li>• Integrated Technology/PPT, Video, DVD</li> <li>• Independent practice worksheets</li> <li>• Group simulation Junior Heart Docs</li> <li>• Laboratory investigation heart dissection</li> <li>• Group investigation - CPR (health/nurse)</li> <li>• Group simulation - blood typing</li> </ul>	<ul style="list-style-type: none"> <li>• Quiz</li> <li>• Test</li> <li>• PPT presentation</li> <li>• Laboratory report</li> </ul>	<p>LS6 (M)</p>
<p><b>Nervous</b></p> <ul style="list-style-type: none"> <li>• Describe the function of the nervous system.</li> <li>• Identify the three types of neurons and explain how they interact (reflex).</li> <li>• Identify the major organs and their functions.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook</li> <li>• Integrated Technology/PPT, Video, DVD</li> <li>• Independent practice worksheets</li> <li>• Group simulation / reflex arc</li> <li>• Laboratory investigation / eye dissection</li> <li>• Laboratory investigation / brain dissection</li> </ul>	<ul style="list-style-type: none"> <li>• Quiz</li> <li>• Test</li> <li>• PPT presentation</li> <li>• Laboratory report</li> </ul>	<p>LS6 (M)</p>
<p><b>Reproduction</b></p> <ul style="list-style-type: none"> <li>• Describe the function of the reproduction system.</li> <li>• Describe the major organs and their functions.</li> <li>• Trace the reproductive pathways for male and female systems.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook</li> <li>• Integrated Technology/PPT, Video, DVD</li> <li>• Independent practice / worksheets</li> </ul>	<ul style="list-style-type: none"> <li>• Quiz</li> <li>• Test</li> <li>• PPT presentation</li> <li>• Laboratory reports</li> </ul>	<p>LS 6 (M)</p>

**Topic: Genetics****Timeline: 2-4 weeks****Outcomes, Learning Experiences and Assessments**

Student Outcomes	Teaching Strategies / Materials	Student Assessment	Standard
<p><b>Inheritance</b></p> <ul style="list-style-type: none"> <li>• Identify the factors that control the inheritance of traits.</li> </ul> <p>Compare and contrast :</p> <p style="padding-left: 20px;">Dominant/recessive Genotype/phenotype Homozygous/heterozygous</p> <ul style="list-style-type: none"> <li>• Use Punnett Square to predict genetic outcomes.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook</li> <li>• Integrated Technology/PPT, Video, DVD</li> <li>• Independent practice worksheets</li> <li>• Group investigation paper pets</li> <li>• Group investigation Smiley genetics</li> <li>• Group investigation create a kid</li> <li>• Group investigation class traits</li> </ul>	<ul style="list-style-type: none"> <li>• Worksheet completion</li> <li>• Group projects</li> <li>• Completed booklet</li> <li>• Quiz</li> </ul>	<p>LS 7 (M) LS 8 (M) LS 9 (M) LS 10 (M)</p>
<p><b>Meiosis</b></p> <ul style="list-style-type: none"> <li>• Identify and describe the events that occur during meiosis.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook</li> <li>• Integrated Technology/PPT, Video, DVD</li> <li>• Independent practice worksheets</li> <li>• Group investigation paper meiosis</li> <li>• Group investigation socks genetics</li> </ul>	<ul style="list-style-type: none"> <li>• Worksheet completion</li> <li>• Group projects</li> <li>• Quiz</li> </ul>	<p>LS 7 (M) LS 8 (M) LS 9 (M) LS 10 (M)</p>
<p><b>DNA transcription</b></p> <ul style="list-style-type: none"> <li>• Understand DNA replication.</li> <li>• Understand the process by which a cell produces a protein.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction/textbook</li> <li>• Integrated Technology/PPT, Video, DVD</li> <li>• Independent practice worksheets</li> <li>• Group investigation coded vocabulary</li> <li>• Group investigation make a sentence</li> </ul>	<ul style="list-style-type: none"> <li>• Worksheet completion</li> <li>• Group projects</li> <li>• Quiz</li> </ul>	<p>LS 4 (M) LS 7 (M)</p>