

Diversity of Living Things Unit Design

Middle School – Grade 7

RI Statements of Enduring Knowledge - (Established Goals):

LS -1 All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, & species).

LS - 2 Matter cycles and energy flows through an ecosystem.

LS - 3 Groups of organisms show evidence of change over time (structures, behaviors and biochemistry).

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<p>Text to be Used: McDougal Littell</p> <p>& *Unit Resource Book (URB) where noted</p>		<p>Diversity of Living Things (DOL) Cells & Heredity (C&H) Ecology (E) Human Biology (HB) <u>OR to be done in Health Classes*(Where underlined and in italics)</u></p>
<p>Related Rhode Island GSE's (Understandings)</p>	<p>RI Assessment Targets Assessment Evidence</p>	
<p>LS1 (7-8) – 1 Students demonstrate understanding of biodiversity by... 1a giving examples of adaptations or behaviors that are specific to a niche (role) within an ecosystem.</p> <p>1b explaining how organisms with different structures and behaviors have roles that contribute to each other's survival and the stability of the ecosystem.</p> <p>LS1 (7-8) – 2 Students demonstrate understanding of structure and function-survival requirements by... 2a explaining how the cell, as the basic unit of life, has the same survival needs as an organism (i.e., obtain energy, grow, eliminate waste, reproduce, provide for defense). 2b observing and describing (e.g., drawing, labeling) individual cells as seen through a microscope targeting cell membrane, cell wall, nucleus, and chloroplasts.</p>	<p>LS1 (5-8) – INQ+ SAE- 1 <i>Using data and observations about the biodiversity of an ecosystem make predictions or draw conclusions about how the diversity contributes to the stability of the ecosystem.</i> Text Reference: Chapter 3.1(DOL) (P.85-91) Activity: How are plants alike/ different? p.83 (DOL) Text Reference: Ecology Chapter 2, p.47 (E) and 1.3 pp. 26 & 27</p> <p>Text Reference; Chapter: Chapter 5.1-5.4(DOL) pp. 157-187 Activity: What good are legs? p.164(DOL) Connecting Sciences- Sticky Feet, p.172(DOL) Bird Beak Adaptations, URB, p.44(DOL)</p> <p>LS1 (5-8) SAE+FAF –2 <i>Describe or compare how different organisms have mechanisms that work in a coordinated way to obtain energy, grow, move, respond, provide defense, enable reproduction, or maintain internal balance (e.g., cells, tissues, organs and systems).</i> Text Reference; Chapter 1, pp. 6-8(C&H) Getting Ready to Learn, p.8(C&H) Text Reference; Chapter 1.1(C&H) pp.9-15 Investigate Cell Models p. 31(C&H) Text Reference; Chapter 1.2(C&H) pp.18-24</p>	

2c observing, describing and charting the growth, motion, responses of living organisms.

LS1 (7-8)–4 Students demonstrate understanding of differentiation by...

4b comparing individual cells of tissues and recognizing the similarities of cells and how they work together to perform specific functions.

4c explaining how each type of cell, tissue, and organ has a distinct structure and set of functions that serve the organism as a whole.

LS2 (7-8) –6 Students demonstrate an understanding of energy flow in an ecosystem by ...

6a explaining the transfer of the sun’s energy through living systems and its effect upon them.

6c explaining the relationship between photosynthesis and respiration.

LS3 (7-8)-9 Students demonstrate an understanding of Natural Selection/evolution by...

9a explaining the genetic variation/traits of organisms are passed on through reproduction and random genetic changes.

LS4 (7-8)-10

Students demonstrate an understanding of human body systems by...

10a identifying the biotic factors (e.g.,

Activity: How do animal and plant cells compare? p. 21(C&H)
Text Reference; Chapter 2.3(C&H) pp.56-63
Activity: How do particles move? p. 56(C&H)
Activity: How does cell size affect transport? p. 62(C&H)
Chapter Investigation: Diffusion, pp. 64-65(C&H)
Graphing Growth, p. 15(DOL)

LS1 (5-8) FAF –4

Explain relationships between or among the structure and function of the cells, issues, organs, and organ systems in an organism.

Text Reference: Chapter 2.1, p. 44 (C&H)

Text Reference; Chapter 2.3(C&H) pp.56-63

Activity: How do particles move? p. 56(C&H)

Activity: How does cell size affect transport? p. 62(C&H)

Chapter Investigation: Diffusion, p 115, URB(C&H)

LS2 (5-8) SAE– 6

Given a scenario trace the flow of energy through an ecosystem, beginning with the sun, through

organisms in the food web, and into the environment (includes photosynthesis and respiration)

Text Reference; Chapter 2.1-2.3(C&H) (pp.41-65)

Activity: Internet-Photosynthesis, p. 39(C&H)

Activity: Elodea and B.T.B. Lab (Sarah/Gale)

LS3 (5-8) – POC - 9

Cite examples supporting the concept that certain traits of organisms may provide a survival advantage in a specific environment and therefore, an increased likelihood to produce offspring.

Genetics-Explore-p. 144 (C&H)

LS4 (5-8) – INQ –10

Use data and observations to support the concept that environmental or biological factors affect human body systems (biotic & abiotic).

Text Reference: Chapter 1 (HB) pp.9-30

Internet Activity-The Human Body, p.133 (HB)

Text Reference: Chapter 5.1-5.3(HB) pp.133-155

Activity: Are there patterns to growth? P.133 ; How has life expectancy changed over time? P.137(HB)

microbes, parasites, food availability, aging process) that have an effect on human body systems.

10b identifying the abiotic factors (e.g., drugs, altitude, weather, pollution) that have an effect on human body systems.

Students demonstrate an understanding of patterns of human health/disease by...

10c identifying the biotic (e.g., microbes, parasites, food availability, aging process) and abiotic (e.g., radiation, toxic materials, carcinogens) factors that cause disease and affect human health.

Text Reference: Chapter 5.2, pp.144-146 (HB) EXCLUDE-DONE IN HEALTH

Text Reference: Chapter 5.3 (HB) pp.148-153
Activity: How easily do germs spread? p.148

Health Curriculum: Standards Covered-Personal Health, Nutrition, Mental & Emotional Health, Substance Use & Abuse Prevention

	Focus Questions (Essential Questions)	Instructional Activities & Investigations (INQ)	Big Ideas (Understandings)
1	What is life?	Text Reference: Chapter 1.0 (DOL) pp.6-35 Activity: Where can you find microscopic life? pp.6-7 (DOL) Getting Ready to Learn, p.8 (DOL)	<ul style="list-style-type: none"> Any free-living thing is an organism. All living organisms exhibit common characteristics: they grow, consume nutrients, exchange gases, respond to stimuli, reproduce, need water, and eliminate waste. Bacteria and protists have the characteristics of living things while viruses are not alive.
2	What are the characteristics of microscopic life?	Text Reference: Chapter 1.1(DOL) pp.9-14 Explore: Organisms p. 9 (C&H)	
		Text Reference: Chapter 1.1-1.4(DOL) pp.6-35 (DOL) Activities: Activity: How quickly do bacteria multiply? p.7 Activity: Math in Science-Graphing Growth p.15 Activity; How do infections spread? p.25 Activity: What lives in pond water? p.31	
3	How does an organism get energy and material from its environment? How do multicellular organisms meet their needs?	Text Reference: Chapter 2.0(DOL) pp. 40-71 Activity: How can a multicellular organism reproduce on its own? p.41 (DOL) Getting Ready to Learn, p.42(DOL) Text Reference: Chapter 2.1, pp. 43-50(DOL) Activity: What are some advantages of specialization? p.44(DOL)	<ul style="list-style-type: none"> Multi-cellular organisms meet their needs in different ways. Plants are producers. Animals are consumers. Most fungi are decomposers.

	<p>In what form does a plant store energy? How do animals respond to their environment?</p> <ul style="list-style-type: none"> • What are decomposers? 	<p>Text Reference: Chapter 2.2, pp. 51-57(DOL) Activity: Where does it come from? p.41(DOL) Text Reference: Chapter 2.3 (DOL) pp.58-64 Activity: What does an owl eat and how well does it digest its food? p. 60(DOL)</p>	
4	<ul style="list-style-type: none"> • What are cells? • How did the invention of the microscope change the study of biology? • What is the structure and function of cells? 	<p>Text Reference; Chapter 1.0, pp. 6-8 Getting Ready to Learn (C&H) Text Reference; Chapter 1.1(C&H) pp.9-15</p> <p>Text Reference; Chapter 1.2(C&H) pp.18-24 Activity: How do animal and plant cells compare? p. 21(C&H)</p> <p>Text Reference; Chapter 1.3(C&H) pp.26-32 Activity: How do roots differ from leaves? p.26(C&H) Activity: What are some of the limitations of using a cell model to represent a cell? p..31(C&H) Cells and Spacesuits, p. 33(C&H) Text Reference; Chapter 2.1-2.3(C&H) pp.41-63 Activity: Internet-Photosynthesis, p. 39(C&H) Elodea and B.T.B. Lab (Department)</p>	<ul style="list-style-type: none"> • The cell is the basic unit of life. • All living things share common characteristics. • All living things are made up of cells • The microscope is a scientific instrument which allows us to see the inside of a cell. • Cells have the same needs and perform the same functions as more complex organisms. • All cells need energy and materials for life processes.
5	<ul style="list-style-type: none"> • How do cells capture and release energy? 	<p>Text Reference; Chapter 2.1-2.2(C&H) pp.41-54 Activity: How can you tell if fermentation releases material? p. 53(C&H)</p> <p>Text Reference; Chapter 2.3(C&H) pp.56-63 Activity: How do particles move? p. 56(C&H) Activity: How does cell size affect transport? p. 62(C&H) Chapter Investigation: Diffusion, URB, p. 115 (C&H)</p>	<ul style="list-style-type: none"> • Cells have defining structures, such as membranes, cell walls, nuclei, chloroplasts, ribosomes, mitochondria, and cytoplasm. • Materials move across the cells membranes

6	<ul style="list-style-type: none"> • How are plants alike/ different? • How do plants grow? 	Text Reference; Chapter 3.0-3.1(DOL) pp.82-91 Activity: How are plants alike/ different? p.83 (DOL)	<ul style="list-style-type: none"> • Plants are a diverse group of organisms that live in many land environments. • Seeds and pollen are reproductive adaptaions • The cotyledon is the primary source of energy for seed germination. • Many plants reproduce with flowers and fruit.
		Text Reference; Chapter 3.3 (DOL) pp.98-103 Activity: What conditions make a pinecone open? p.102(DOL)	
		Chapter Investigation: Which seeds will grow? pp. 104-105(DOL) <i>May need to modify/differentiate.</i> Text Reference; Chapter 3.4(DOL) pp.107-114	
7	<ul style="list-style-type: none"> • What is transpiration? 	Text Reference; Chapter 3.1, p.87(DOL) Chloroplast Math, p. 115(DOL)	<ul style="list-style-type: none"> • Xylem is the system of tubelike connected cells that transports water from the roots to all structures of the plant. • Stomates are openings on leaves that are controlled by guard cells.
		Activity: What parts of a flower can you identify? p. 111(DOL)	
8	<ul style="list-style-type: none"> • What are the parts of a flower? • How do plants reproduce? 	Text Reference; Chapter: Chapter 3.4 (DOL) pp.107-114	<ul style="list-style-type: none"> • Pollen from the anthers on stamens and eggs in the ovules of the pistil are the male and female cells that combine during sexual reproduction to develop into a seed. • Sepals, petals, stamens, and pistils are the major structures of typical flowers.
		Text Reference; Chapter: Chapter 3.4(DOL) pp.107-114 Investigation: Flower Parts, p.111(DOL)	
9	<ul style="list-style-type: none"> • How do organisms adapt in order to survive? 	Text Reference; Chapter: Chapter 5.1-5.4(DOL) pp.157-187 Activity: How does a fish's shape help it move? p.157(DOL) <i>For discussion purposes</i> Activity: What good are legs? P.164(DOL) Connecting Sciences- Sticky Feet, p.172(DOL) Bird Beak Adaptations, URB, p. 344(DOL)	<ul style="list-style-type: none"> • Adaptations are structures or behaviors of organisms that enhance their chances to survive and reproduce in their habitat. • Insects have three body parts, six legs and two antennae.
		Text Reference; Chapter: Chapter 4.4(DOL) pp.142-149 Activity: What are some characteristics of arthropods? p..142(DOL) Pill Bugs recommended.	