

Course Title: Life Science 7

Topic/Concept: Chapter 1 - Life

Time Allotment: 8 days

Unit Sequence: 1

Major Concepts to be learned:

1. What does it mean to be living and what are the main theories on the origins of life?
2. What are life processes?
3. What are the basic life requirements for organisms?
4. What is the scientific method?
5. What is the basic shape/structure of cells?

Expected Skills to be demonstrated:

1. Define life and life processes and be able to give examples to illustrate comprehension.
2. Be able to design an experiment using the scientific method, identifying each step of the method being used.
3. Understand origins of life

PA Standards/Anchors:

Eligible Content:

S8.A.1.1
S8.A.1.1
S8.A.1.1
S8.B.1.1

- S8.A.1.1.1
- S8.A.1.1.2
- S8.A.1.1.3
- S8.B.1.1.1

Instructional Strategies:

Assessments:

Problem solving activities
Lecture
Written work
Hands-on activity
Note Taking
Evaluating

- Chapter 1 Quiz
- Chapter 1 Test
- Notebook - notes and vocabulary

Course Title: Life Science 7

Topic/Concept: Chapter 2 - Cell structure

Time Allotment: 12 days

Unit Sequence: 2

Major Concepts to be learned:

1. Is a virus living or nonliving?
2. What are current major viral diseases/epidemics?
3. What are basic components and shapes of plant and animal cells?
4. Microscope Parts and how to use them properly.
5. Prokaryote vs Eukaryote

Expected Skills to be demonstrated:

1. How to use a microscope
2. Identify parts of a plant/animal cell
3. Differences and examples of prokaryotes and eukaryotes
4. Why diseases are hard to treat - why new drugs/vaccines have to be created
5. Be able of current diseases and how they affect humans - how they are transmitted
6. How cells are organized - from cellular level all the way up to the organism
7. Effects of Salt on Cells - Lab activity with Elodea Plant

PA Standards/Anchors:

Eligible Content:

S8.A.3.1
S8.B.1.1
S8.B.1.1
S8.B.1.1
S8.A.1.1

- S8.A.3.1.2
- S8.B.1.1.2
- S8.B.1.1.3
- S8.B.1.1.4
- S8.A.1.1.3

Instructional Strategies:

Assessments:

Cooperative groups
Lecture
Group discussion
Performance task
Hands-on activity
Note Taking

- Microscope Parts Quiz
- Chapter 2 Test

Course Title: Life Science 7

Topic/Concept: Chapter 3 - Cell Processes

Time Allotment: 9 Days

Unit Sequence: 3

Major Concepts to be learned:

1. Composition of Matter - Atoms and their components
2. Elements/Ions
3. Simple Chemical Reactions
4. Cell Transportation
5. Photosynthesis/Cellular Respiration
6. Biomass energies

Expected Skills to be demonstrated:

1. Know parts of atom
2. How ions are formed - gaining/losing electrons
3. How objects get into cells - passively/actively - osmosis/diffusion - endocytosis/exocytosis and relate to the Elodea Salt Water Lab
4. Photosynthesis
5. Cellular Respiration
6. Sun - ultimate source of all energy
7. Basic consumer/producer relationships
8. Types of alternative energies made from plants

PA Standards/Anchors:

Eligible Content:

S8.B.3.3
S8.C.1.1
S8.C.1.1
S8.C.2.2

- S8.B.3.3.2
- S8.C.1.1.1
- S8.C.1.1.3
- S8.C.2.2.1

Instructional Strategies:

Assessments:

Lecture
Hands-on activity
Note Taking

- Chapter 3 Quiz
- Chapter 3 Test(Elodea Lab - transition from Chapter 2 but tied into Chapter 3)

Course Title: Life Science 7

Topic/Concept: Chapter 4 - Cell Reproduction

Time Allotment: 11 Days

Unit Sequence: 4

Major Concepts to be learned:

1. Mitosis/Meiosis
2. Asexual vs. Sexual reproduction
3. DNA Cloning

Expected Skills to be demonstrated:

1. Why Cells divide - why new cells needed?
2. Steps of Mitosis/Meiosis
3. Why Mitosis/Meiosis are important to reproduction
4. Chemical make up of DNA & how it's message is encoded
5. DNA Technology - why cloning is important in future

PA Standards/Anchors:

Eligible Content:

S8.B.2.1
S8.B.2.2
S8.B.2.1
S8.A.1.2

- S8.B.2.1.3
- S8.B.2.2.2
- S8.B.2.1.4
- S8.A.1.2.1

Instructional Strategies:

Assessments:

Cooperative groups
Problem solving activities
Lecture
Hands-on activity
Note Taking
DNA compaction Lab - how much dna can fit in a cell

- Lab activity - DNA compaction- how much DNA is inside of a cell
- Ch4 Quiz
- Ch4 Test

Course Title: Life Science 7

Topic/Concept: Chapter 5 - Heredity

Time Allotment: 10 Days

Unit Sequence: 5

Major Concepts to be learned:

1. How traits are passed on to offspring
2. Dominant/Recessive Traits
3. Incomplete Dominance
4. Genotypes vs Phenotypes
5. How is sex/gender determined
6. Human Genome Project

Expected Skills to be demonstrated:

1. How are traits acquired
2. Father of Genetics – mendel
3. Different types of inheritance - dominant/recessive (mendelian), incomplete dominance, polygenic, sex-linked
4. Read a pedigree - identify unknown parents for sex-linked trait, genetic disorders
5. Importance of human genome project
6. Punnett Squares

PA Standards/Anchors:

Eligible Content:

S8.B.2.1
S8.B.2.2
S8.B.2.2
S8.A.1.2

- S8.B.2.1.3
- S8.B.2.2.1
- S8.B.2.2.2
- S8.A.1.2.3

Instructional Strategies:

Assessments:

Cooperative groups
Problem solving activities
Lecture
Hands-on activity
Note Taking

- Punnett Square homework
- Sex-linked disorder homework
- Ch5 Quiz
- Ch5 Test

Course Title: Life Science 7

Topic/Concept: Chapter 6 - Evolution

Time Allotment: 7 Days

Unit Sequence: 6

Major Concepts to be learned:

1. Evolution by Natural Selection
2. Sources of Variation
3. Evidence for Evolution
4. Primate Evolution – hominids
5. Phylogenies
6. Threatened/Endangered/Extinct species

Expected Skills to be demonstrated:

1. Darwin - Evolution by Natural Selection
2. How evolution occurs
3. Why do variations occur in organisms
4. How fast evolution occurs
5. What are some types of evidence for evolution
6. Did we (humans) evolve from monkeys?
7. Extinction is a natural process

PA Standards/Anchors:

Eligible Content:

S8.B.1.1	S8.B.1.1	• S8.B.1.1.1	• S8.B.2.1.3
S8.B.2.1	S8.B.2.1	• S8.B.1.1.2	• S8.B.2.1.4
S8.B.2.1	S8.B.2.1	• S8.B.2.1.1	• S8.B.3.2.3
S8.B.3.2	S8.D.1.1	• S8.B.2.1.2	• S8.D.1.1.4

Instructional Strategies:

Assessments:

Lecture Group discussion Note Taking Videos - PBS.org on evolution	• Chapter 6 Quiz • Chapter 6 Test
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Course Title: Life Science 7

Topic/Concept: Chapter 7 - Classification of living things

Time Allotment: 13 Days

Unit Sequence: 7

Major Concepts to be learned:

1. Levels of classification - Kingdom down to species
2. Scientific naming
3. Six Kingdoms
4. Characteristics of each kingdom
5. Dichotomous keys to identify organisms

Expected Skills to be demonstrated:

1. Proper scientific naming
2. Characteristics/identify members of each kingdom
3. Correctly identify organisms based on dichotomous key
4. What is biodiversity - where would you find the most

PA Standards/Anchors:

Eligible Content:

S8.A.3.1
S8.B.1.1
S8.B.1.2

- S8.A.3.1.2
- S8.B.1.1.2
- S8.B.1.2.3

Instructional Strategies:

Assessments:

Coooperative groups
Problem solving activities
Lecture
Performance task
Hands-on activity
Note Taking

- Dichotomous key homework - (2) Acronym homework to remember levels of organization (Kingdom, phylum, etc) Owl Pellet dissection - (also dichotomous key related)
- Online tree dichotomous key
- Ch7 Quiz
- Ch7 Test

Course Title: Life Science 7

Topic/Concept: Chapters 8/9 - Bacteria, Protists and Fungi

Time Allotment: 14 days

Unit Sequence: 8

Major Concepts to be learned:

1. Characteristics of each Kingdom (Eubacteria, Archaeobacteria, Protists, Fungi)
2. Examples of each Kingdom
3. Uses of bacteria, protists, fungi - good and bad
4. Bacterial diseases
5. Red Tides - environmental issues

Expected Skills to be demonstrated:

1. Know characteristics of each kingdom
2. Recognize members of each kindgom
3. How members of these kindgdoms affect usantibiotic resistance - consequences of using drugs repeatedly over long periods of time
4. How bacteria are used to make many food items

PA Standards/Anchors:

Eligible Content:

S8.B.1.1
S8.B.1.1
S8.B.1.1

- S8.B.1.1.1
- S8.B.1.1.2
- S8.B.1.1.3

Instructional Strategies:

Assessments:

Cooperative groups
Lecture
Research
Hands-on activity
Note Taking
Lab and video on making cheese

- Ch8 Quiz
- Ch9 Quiz
- Chapter 9:1 homework
- Bacteria Webquest - find information
- Ch8/9 Test (one test combined)

Course Title: Life Science 7

Topic/Concept: Chapters 13/14 - Invertebrate Animals

Time Allotment: 17 Days

Unit Sequence: 9

Major Concepts to be learned:

1. Animal characteristics
2. Importance of corals, cnidarians, parasitic worms, mollusks, worms, arthropods (insects), examples and characteristics of each, pesticides
3. Dissections - animal parts (worm and grasshopper)

Expected Skills to be demonstrated:

1. Recognize characteristics of different invertebrates
2. Dissect & identify body parts of different organisms
3. Understand importance of various organisms and how changes in environment affects them
4. Classification of animals

PA Standards/Anchors:

Eligible Content:

S8.A.3.1
S8.B.1.1
S8.B.1.1
S8.B.1.1
S8.B.3.3

- S8.A.3.1.2
- S8.B.1.1.1
- S8.B.1.1.2
- S8.B.1.1.3
- S8.B.3.3.4

Instructional Strategies:

Assessments:

Cooperative groups
Lecture
Group discussion
Research
Written work
Hands-on activity
Note Taking

- Worm and Grasshopper Dissections
- Webquest (research) on insects
- NY Times article and questions on insects
- Write short stories involving a certain insect and characteristics
- Ch13 Quiz
- Ch14 Quiz
- Ch13/14 Test (combined)

Course Title: Life Science 7

Topic/Concept: Chapter 15 - Fish, Amphibians and Reptiles

Time Allotment: 8 Days

Unit Sequence: 10

Major Concepts to be learned:

1. Fish characteristics/adaptations
2. Amphibian characteristics/adaptations
3. Metamorphosis
4. Reptile characteristics/adaptations

Expected Skills to be demonstrated:

1. Characteristics/features of Amphibians
2. Characteristics/features of Reptiles
3. Characteristics/features of Fish
4. Similarities between these groups of organisms - evolution

PA Standards/Anchors:

Eligible Content:

S8.B.1.1
S8.B.1.1
S8.B.1.1

- S8.B.1.1.1
- S8.B.1.1.2
- S8.B.1.1.3

Instructional Strategies:

Assessments:

Problem solving activities
Lecture
Hands-on activity
Note Taking
Video clips

- Chapter 15 quiz
- Fish swim bladder lab activity
- Chapter 15 test

Course Title: Life Science 7

Topic/Concept: Chapter 16 - Birds and Mammals

Time Allotment: 7 Days

Unit Sequence: 11

Major Concepts to be learned:

1. Characteristics/Adaptations of Birds
2. Adaptations for flying
3. Characteristics/Adaptations of Mammals

Expected Skills to be demonstrated:

1. Understand characteristics/features of both birds and mammals
2. Show how these group of organisms evolved or what organisms they evolved from (birds from dinosaurs)

PA Standards/Anchors:

Eligible Content:

S8.B.1.1
S8.B.1.1
S8.B.1.1

- S8.B.1.1.1
- S8.B.1.1.2
- S8.B.1.1.3

Instructional Strategies:

Assessments:

Lecture
Note Taking
Specific Reading
Video Clips

- Homework
- Chapter 16 Test

Course Title: Life Science 7

Topic/Concept: Chapter 21 - HumanBody: bones, muscles, and skin

Time Allotment: 7 Days

Unit Sequence: 12

Major Concepts to be learned:

1. Skeleton - major bones of the body
2. Joints
3. Types of muscles
4. Skin

Expected Skills to be demonstrated:

1. identify and label major bones of the body
2. Cartilage - tendons/ligaments
3. Different types of muscle and where they are used
4. Parts of heart
5. Functions of skin and the layers

PA Standards/Anchors:

Eligible Content:

S8.B.1.1
S8.B.1.1
S8.B.1.1

- S8.B.1.1.1
- S8.B.1.1.2
- S8.B.1.1.3

Instructional Strategies:

Assessments:

Lecture
Performance task
Research
Charting
Evaluating
Video clips

- Quiz – skeleton
- Chapter 21 Test
- Metabolism project

Course Title: Life Science 7

Topic/Concept: Metabolism Project

Time Allotment: 4-5 Days

Unit Sequence: 12.5

Major Concepts to be learned:

1. Connect relationship between body temp and metabolism

Expected Skills to be demonstrated:

1. Measure temperature using thermometers
2. Apply scientific method - make hypothesis, experiment and analyze results
3. Generating graphs on microsoft excel

PA Standards/Anchors:

Eligible Content:

S8.A.1.1
S8.A.1.1
S8.A.2.1
S8A.2.1
S8.A.2.2

- S8.A.1.1.3
- S8.A.1.1.4
- S8.A.2.1.4
- S8.A.2.1.5
- S8.A.2.2.2

Instructional Strategies:

Assessments:

Problem solving activities
Performance task
Research
Evaluating
Graphing - Microsoft Excel

- Formal Lab Report on connection between their temperature and metabolism

Course Title: Life Science 7

Topic/Concept: Chapters 22-24 Digestive, Circulatory, & Respiratory System

Time Allotment: 7 Days

Unit Sequence: 13

Major Concepts to be learned:

1. Role of Digestive System
2. Role of Circulatory System
3. Role of Respiratory System

Expected Skills to be demonstrated:

1. Purpose of circulatory system
2. How blood flows
3. Oxygenated vs deoxygenated blood
4. Functions of heart
5. Role of digestive system - nutrient absorption
6. Respiratory system and diseases that affect it

PA Standards/Anchors:

Eligible Content:

S8.B.1.1
S8.B.1.1
S8.B.1.1

- S8.B.1.1.1
- S8.B.1.1.2
- S8.B.1.1.3

Instructional Strategies:

Assessments:

Lecture
Hands-on activity
Note Taking
Heart Dissection Demonstration - Cow Hearts

- Chapters 22-24 Test

Course Title: Life Science 7

Topic/Concept: Chapters 18 & 19 - Ecology Unit

Time Allotment: 14 Days

Unit Sequence: 14

Major Concepts to be learned:

1. Biotic/abiotic factors
2. Interactions among organisms
3. Energy cycle (pyramids)
4. Ecological succession
5. Different biomes - land and water

Expected Skills to be demonstrated:

1. What are Biotic and Abiotic Factors
2. Show how interactions among organisms affect populations
3. Population densities
4. Limiting factors
5. Carrying capacities of an environment
6. Biotic Potential
7. Energy flow in an ecosystem - energy pyramids, food chains
8. Water/nitrogen cycles
9. Ecological succession of an environment
10. Different land and water biomes on earth

PA Standards/Anchors:

Eligible Content:

S8.A.1.3	S8.A.3.1	• S8.A.1.3.2	• S8.A.3.1.4
S8.A.3.1	S8.A.3.1	• S8.A.3.1.1	• S8.B.3.1.3
S8.B.3.1		• S8.A.3.1.2	

Instructional Strategies:

Assessments:

Cooperative groups	Lecture	• Chapter 18 Quiz
Group discussion	Research	• Chapter 18/19 Test
Note Taking		• Webquest (research activity)Small group discussions

Course Title: Life Science 7

Topic/Concept: Chapters 10 & 11 - Plants

Time Allotment: 10 days

Unit Sequence: 15

Major Concepts to be learned:

1. Characteristics/adaptations of plants
2. Vascular/nonvascular plants
3. Angiosperms/gymnosperms
4. Plant Parts
5. Plant Reproduction

Expected Skills to be demonstrated:

1. Plant characteristics/adaptions for life on land/water
2. Importance of plants of medicinal purposes
3. Monocots vs dicots
4. Angiosperms vs gymnosperms
5. Specific plant parts and how they function in reproduction, nutrient uptake, respirationvascular vs nonvascular plants

PA Standards/Anchors:

Eligible Content:

S8.A.3.3
S8.B.1.1
S8.B.1.1
S8.B.1.1
S8.B.3.3

- S8.A.3.3.2
- S8.B.1.1.1
- S8.B.1.1.2
- S8.B.1.1.3
- S8.B.3.3.4

Instructional Strategies:

Assessments:

Problem solving activities
Lecture
Performance task
Hands-on activity
Note Taking
Population sampling (outside)

- Chapter 10 Quiz
- Chapter 10/11 Test
- Population sampling activity - compiling and analyzing data

Course Title: Life Science 7

Topic/Concept: Chapter 12 - Plant Processes

Time Allotment: 7 Days

Unit Sequence: 16

Major Concepts to be learned:

1. Photosynthesis
2. Respiration
3. Tropisms - Plant Responses Transgenic Crops

Expected Skills to be demonstrated:

1. Understand importance of Photosynthesis and connection to all living things
2. Describe respiration and relationship to photosynthesis
3. Explain relationship between stimuli and tropisms
4. Understand how genetic engineering is changing foods - for the good or bad

PA Standards/Anchors:

Eligible Content:

S8.A.1.2
S8.A.1.2
S8.A.1.2
S8.B.1.1
S8.B.3.2

- S8.A.1.2.1
- S8.A.1.2.3
- S8.A.1.2.4
- S8.B.1.1.1
- S8.B.3.2.3

Instructional Strategies:

Assessments:

Lecture
Hands-on activity
Note Taking
Specific Reading

- Chapter 12 Test
- Specific Reading assignments - scientific articles