

Course Overview

This course is designed for students who need a basic understanding of biological topics. Units of study include scientific methods of investigation, basic chemistry concepts, ecology, cells, genetics and heredity, evolution and grouping of organisms. Coursework is supplemented by textbook and current journal readings and lab activities. All students will submit a group experiment to be presented in class in the fall. Students will follow along coursework with a science inquiry packet that includes lab work. A variety of assessments will be offered from tests, quizzes, and projects. The Missouri End of Course Assessment applies to biology.

Гimeframe	Scope An Unit	d Sequence Instructional Topics
15 Day(s)	Introduction to Biology Concepts	Characteristics of Life Scientific Method with Claim, Evidence & Reasoning Experiment & Variables Graphing Lab Equipment Metric Measurement
10 Day(s)	Molecules for Life	Structure of Matter Structure and function of organic molecules
20 Day(s)	Organization of Life and Homeostasis	Organization of Atom to Organism with Specialization of Cells Cell Structure & Function Human Body Systems Homeostatic Process of Positive & Negative Feedback
22 Day(s)	Cellular Reactions	Differentiation between Prokaryotic & Eukaryotic Cells with Organelles ATP for Autotrophs & Heterotrophs Rates of Photosynthesis with Chloroplast Functions of Anaerobic & Aerobic Respiration with Mitochondria Dynamics of Cell Transport
15 Day(s)	Function of DNA & Protein Synthesis in Relation to Cell Organelles	DNA Structure in the Nucleus & Replication RNA Structure & Replication Process RNA Protein Synthesis Process The role of enzymes in chemical reactions
25 Day(s)	Cell Division with Genetic Inheritance & Variation of Traits	1. Role of DNA & chromosomes 2. Mitosis with Cell Repair & Specialization 3. Meiosis for Variation 4. Embryology 5. Gene Expression 6. Role of Meiosis in Variation (Mendel Principles) 7. Genetic Mutations & Disorders 8. Biotechnology
30 Day(s)	Flow of Matter & Energy with Community Interactions	1. Food Chains, Food Webs & Biomass Pyramids 2. Carbon Flow through Ecosystem 3. Connection of carbon & oxygen flow in ecosystem 4. Biogeochemical Cycle- Water 5. Biogeochemical Cycle- Nitrogen & Phosphorus 6. Symbiotic Relationships 7. Coral Reef interaction with marine life 8. Biomes
8 Day(s)	Changes in Ecosystems with Human Dependence on Earth & Interactions	Population Ecology Growth of human population on ecosystems Human activities impact on Earth
10 Day(s)	Earth's History & Formation	Plate Tectonics & Law of Superposition Differences in oceanic rocks (include meteorites) Carbon 14 Dating Biogeography
10 Day(s)	Common Ancestry & Natural Selection	1. Fossil Record 2. Patterns of Evolution 3. Reproductive Isolations 4. Adoptive Rediction

Biodiversity

10 Day(s)

4. Adaptive Radiation

3. Dissections

1. Taxonomy & Binomial Nomenclature

2. Kingdoms & Characteristics

Grade(s) 10th, Duration 1 Year, 1 Credit Required Course

Duration: 15 Day(s)

Duration: 3 Day(s)

Duration: 2 Day(s)

Duration: 3 Day(s)

Prerequisites

9th Grade Physical Science

Course Details

Unit: Introduction to Biology Concepts

Unit Description

Students will deepen their basic understanding of biology and decide what characteristics of life apply to living and nonliving entities. During this unit, students will review the use and safety of lab equipment to conduct experiments.

Academic Vocabulary

observation

hypothesis

experiment

independent variable

dependent variable

control

constant

data

conclusion

theory

scientific law

DNA

stimulus

asexual reproduction sexual reproduction

homeostasis

metabolism

unicellular

multicellular

natural selection

evolution

Topic: Characteristics of Life

Topic Description (short)

Using scientific inquiry methods, the following characteristics of life will be discussed: cells, DNA, reproduction, growth & development, energy, homeostasis, response to stimuli and adaptations.

Learning Targets

List the characteristics of living things.

Apply characteristics of life to a living versus nonliving item using claim, evidence and reasoning.

Learning Targets linked to Priority Standard = ♣

Topic: Scientific Method with Claim, Evidence & Reasoning

Learning Targets

Students will implement an activity that relates to the human body addressing functions of a system and evaluate the response to stimulus using Claim, Evidence & Reasoning.

Learning Targets linked to Priority Standard = 4

Topic: Experiment & Variables

Learning Targets

Review experiments and scenarios to identify the independent and dependent variables along with control and constant.

Learning Targets linked to Priority Standard = 4

Topic: Graphing **Duration:** 2 Day(s)

Learning Targets

Students will demonstrate graphing skills based on experiments to analyze data.

Learning Targets linked to Priority Standard = ♣

Topic: Lab Equipment Duration: 2 Day(s)

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Learning Targets

Students will participate in lab activities that model how to use lab equipment.

Grade(s) 10th, Duration 1 Year, 1 Credit Required Course

Duration: 3 Day(s)

Learning Targets linked to Priority Standard = ♣

Topic: Metric Measurement

Learning Targets

Students will measure and calculate distance, weight, temperature, etc. and convert numbers using SI for labs.

Learning Targets linked to Priority Standard = ♣

Unit: Molecules for Life Duration: 10 Day(s)

Unit Description

Students will demonstrate how atomic structure effect the makeup of macromolecules and enzymatic reactions. A section will be spent on water properties and how this molecule interacts with living things.

Academic Vocabulary

atom

nucleus

electron

proton

neutron

element

isotope

compound

ionic bond

covalent bond

molecule

cohesion

adhesion

mixture solution

Solutio

solute

solvent

pH scale

acid base

buffer

monomer

polymer

carbohydrate

monosaccharide

glucose sucrose

starch

lipid

fatty acid

triglyceride

saturated

unsaturated

steroid

hormone

phospholipid

protein

amino acid peptide

dipeptide

enzyme

activation energy

nucleic acid

nucleotide

DNA RNA

Topic: Structure of Matter

Duration: 4 Day(s)

Learning Targets

Students will describe the various states of matter with solid, liquid, gas and plasma.

Students will use the periodic table to determine subatomic properties and structure for an atom.

Students will relate to the properties of water focusing on bonds and pH for chemical reactions.

Grade(s) 10th, Duration 1 Year, 1 Credit Required Course

Duration: 6 Day(s)

Duration: 20 Day(s)

Learning Targets linked to Priority Standard = ₽

Topic: Structure and function of organic molecules

Learning Targets

Students will identify monomers and polymers of organic macromolecules.

Students will create macromolecules using atomic models and differentiate between structure and function of carbohydrates, lipids, proteins and nucleic acids.

Students will conduct an activity to demonstrate enzymes as catalyst and relate to the process of cell respiration.

Learning Targets linked to Priority Standard = ♣

Unit: Organization of Life and Homeostasis

Unit Description

Life is broken into various sections from being general to very specific. This unit will differentiate between types of kingdoms and how organisms vary from single to multicell organisms. In addition, each living thing has to respond to stimuli and maintain an internal balance known as homeostasis.

Academic Vocabulary

Atom

Unicellular

Multicellular

Cells

Tissue

Organ

Organ System

Nervous System

Muscular System

Circulatory System

Skeletal System

Respiratory System

Digestive System Excretory System

Organism

Population

Community

Ecosystem

Biosphere

Homeostasis

Negative & Positive Feedback

Claim

Evidence

Reasoning

Observation

Hypothesis Experiment

Control

Constant

Independent & Dependent Variables

Data

Conclusion

Bias

Scientific Law

Theory

Observation

Topic: Organization of Atom to Organism with Specialization of Cells

Learning Targets

Students will familiarize with hierarchy of life from atom to whole organism.

Learning Targets linked to Priority Standard = ♣

Topic: Cell Structure & Function

Learning Targets

Students will differentiate between basic cell types of Bacteria, Protist, Fungi, Plant and Animals.

Learning Targets linked to Priority Standard = ♣

Duration: 3 Day(s)

Duration: 1 Day(s)

Grade(s) 10th, Duration 1 Year, 1 Credit

Required Course **Duration:** 2 Day(s)

Topic: Human Body Systems

Learning Targets

Students will conduct simple activities and discuss each of the human body systems (circulatory, respiratory, digestive, urinary, nervous, skeletal, muscular, immune and reproductive system).

Learning Targets linked to Priority Standard = ♣

Topic: Homeostatic Process of Positive & Negative Feedback

Duration: 5 Day(s)

Topic Description (short)

Students will create and implement an experiment that investigates positive and negative feedback that deals with the human body pertaining to heart rate, respiration rate, integumentary and nervous system.

Learning Targets

Design, implement and analyze data to determine how human body responds with negative and postive feedback for homeostasis.

Learning Targets linked to Priority Standard = 부

Unit: Cellular Reactions

Duration: 22 Day(s)

Unit Description

Students will distinguish between prokaryotic and eukaryotic cell structure and functions. These sections include endomembranes, cell membrane for transport and mitochondria with chloroplast for biochemical reactions.

Academic Vocabulary

Cells

Cell Theory

Prokaryote

Eukarytote

Cell Membrane

Nucleus

Nucleoid Region

Cytoplasm

Organelles

Flagella

Cilia

Ribosomes

Rough Endoplasmic Reticulum

Smooth Endoplasmic Reticulum

Golgi Bodies

Lysosomes

Cytoskeleton

Centrioles

Microtubules

Microfilaments

Intermediate Filaments

Mitochondria

Vesicles

Vacuoles

Chloroplasts

Cell Transport

Selectively Permeable

Passive Transport

Diffusion

Facilitated Diffusion

Osmosis

Hypotonic

Hypertonic

Isotonic

Active Transport

Sodium Potassium Pump

Endocytosis

Phagocytosis

Pinocytosis

Exocytosis

Topic: Differentiation between Prokaryotic & Eukaryotic Cells with

Organelles

Learning Targets

Duration: 10 Day(s)

Science

Grade(s) 10th, Duration 1 Year, 1 Credit Required Course

Students will be able to differentiate between simple and complex cells using classification of prokaryotic versus eukaryotic in relation to organelle function and structure.

Learning Targets linked to Priority Standard = ♣

Topic: ATP for Autotrophs & Heterotrophs

Duration: 3 Day(s)

Learning Targets

Students will describe the process autotrophs use to ultimately make ATP and food for the organism.

Students will describe the process heterotrophs will use to ultimately make ATP from chemical components.

Learning Targets linked to Priority Standard = ♣

Topic: Rates of Photosynthesis with Chloroplast

Duration: 3 Day(s)

Topic Description (short)

Students will be able to demonstrate knowledge of the carbon cycle as it pertains to the chloroplast and its function of photosynthesis to make food and have a byproduct of oxygen.

Learning Targets

Students will conduct and experiment to observe how the interaction between carbon dioxide with a plant produces oxygen.

Learning Targets linked to Priority Standard = ₽

Topic: Functions of Anaerobic & Aerobic Respiration with Mitochondria

Duration: 5 Day(s)

Topic Description (short)

Summarize how energy transfer occurs during cellular respiration as energy is stored and released from the bonds of chemical compounds.

Learning Targets

Students will learn how organisms obtain energy and identify reactants and products of cell respiration.

Learning Targets linked to Priority Standard = ♣

Topic: Dynamics of Cell Transport

Duration: 4 Day(s)

Learning Targets

Students will utilize various materials to model how materials use passive transport to keep homeostasis. In addition, active transport will be compared and contrasted with passive transport.

Learning Targets linked to Priority Standard = ♣

Unit: Function of DNA & Protein Synthesis in Relation to Cell

Organelles

Duration: 15 Day(s)

Unit Description

Students will determine the structure and function of DNA and RNA in the role of genetics and coding for proteins.

Academic Vocabulary

DNA

Nucleic Acid

Nucleotide

Phosphate

Deoxyribose

Nitrogen Base Pairs

Thymine

Adenine

Guanine

Cytosine

RNA Ribose

Uracil

mRNA tRNA

rRNA

Transcription

Translation

Topic: DNA Structure in the Nucleus & Replication

Duration: 3 Day(s)

Topic Description (short)

Students will learn how the structure of DNA with nitrogen bases determines nucleotide structure and how this information is replicated.

Learning Targets

Describe and model the chemical and structural properties of DNA and replication process.

Grade(s) 10th, Duration 1 Year, 1 Credit Required Course

Learning Targets linked to Priority Standard = ♣

Duration: 3 Day(s)

Duration: 3 Day(s)

Duration: 4 Day(s)

Duration: 25 Day(s)

Topic: RNA Structure & Replication Process

Topic Description (short)

Students will learn how the structure of RNA codes for proteins.

Learning Targets

Describe the chemical and structural properties of RNA and application to protein synthesis.

Learning Targets linked to Priority Standard = ♣

Topic: RNA Protein Synthesis Process

Topic Description (short)

Students will learn that DNA codes for proteins through the structure of RNA.

Learning Targets

Model steps of protein synthesis through transcription and translation.

Learning Targets linked to Priority Standard = ♣

Topic: The role of enzymes in chemical reactions

Learning Targets

Students will demonstrate the process of using DNA to code for proteins and follow through the transcription and translation process to make a protein. Discussion will focus on how proteins can be enzymes that lower the activation energy of a reaction. Main focus will be on lactase.

Learning Targets linked to Priority Standard = 🗗

Unit: Cell Division with Genetic Inheritance & Variation of Traits

Academic Vocabulary

Asexual Reproduction

Binary Fission

Budding

Regeneration

Mitosis

Interphase

G1

G2

G0 S

Interphase

Centrioles

Nuclear Membrane

Prophase

Chromatin

Chromosome

Spindle Fibers

Metaphase

Kinetochore Fibers

Anaphase

Telophase

. Cleavage Furrow

Cell Plate

Cytokinesis

Daughter Cells

Diploid

Sexual Reproduction

Meiosis

Prophase 1 & 2

Crossing Over

Metaphase 1 & 2

Anaphase 1 & 2

Telophase 1 & 2

. Haploid

Gregor Mendel

Punnett Squares

Homozygous

Heterozygous

Science

Grade(s) 10th, Duration 1 Year, 1 Credit Required Course

Dominant

Recessive

Genotype

Phenotype

Monohybrid Cross

Dihybrid Cross

Genetic Mutations

Genetic Disorders

Sickle Cell Anemia

Hemophilia

Cystic Fibrosis

Phenylketonuria Muscular Dystrophy

Tay-Sachs

Down's Syndrome

Klinefelter's Syndrome

Turner's Syndrome

Genetic Engineering

Cloning Stem Čells

CRISPR

Topic: Role of DNA & chromosomes

Duration: 4 Day(s)

Learning Targets

Students will differentiate between terms of genotype and phenotype that apply to chromosomes and genes for genetic inheritance.

Learning Targets linked to Priority Standard = ♣

Topic: Mitosis with Cell Repair & Specialization

Duration: 4 Day(s)

Learning Targets

Students will model through activities to demonstrate the stages of mitosis that results in two identical cells using asexual reproduction.

Learning Targets linked to Priority Standard = 4

Topic: Meiosis for Variation

Duration: 3 Day(s)

Learning Targets

Students will demonstrate using models and activities the steps of meiosis that leads to crossing over and the production of haploid, different cells from parent.

Students will compare and contrast the processes and organisms that utilize asexual and sexual reproduction.

Learning Targets linked to Priority Standard = ♣

Topic: Embryology **Duration:** 2 Day(s)

Learning Targets

Discussion will occur how genetic inheritance impacts the development of cells for specialization.

Learning Targets linked to Priority Standard = ₽

Topic: Gene Expression **Duration:** 2 Day(s)

Learning Targets

Students will express how gene penetrance occurs with traits are passed down generations.

Learning Targets linked to Priority Standard = ♣

Topic: Role of Meiosis in Variation (Mendel Principles) **Duration:** 5 Day(s)

Learning Targets

Using terminology from genetic crosses, students will determine the probability of traits created through the process of meiosis and indicate variations from sexual reproduction.

Learning Targets linked to Priority Standard = ♣

Topic: Genetic Mutations & Disorders

Duration: 3 Day(s)

Learning Targets

Students will discuss the differences between mutations and determine how the possibility of having a recessive, dominant or sex-linked genetic disorder occurs using a Punnett square.

Learning Targets linked to Priority Standard = ♣

Grade(s) 10th, Duration 1 Year, 1 Credit Required Course

Duration: 30 Day(s)

Topic: Biotechnology Duration: 2 Day(s)

Learning Targets

Students will become familiar with types of technology that are used with DNA and determining of traits. In addition, students will research about system in place such as stem cell technology looking at bringing back endangered species or increasing biodiversity.

Learning Targets linked to Priority Standard = \$\frac{4}{3}\$

Unit: Flow of Matter & Energy with Community Interactions

Unit Description

Students will be able to identify relationships among organisms and evaluate how energy is transferred from one organism to another. This interaction of matter also includes the movement of carbon, water, nitrogen and phosphorus. Additionally, students will include the characteristics of each major terrestrial and aquatic biome to apply how energy flows throughout the Earth and how interconnected relationships exist.

Academic Vocabulary

biosphere

species

population

community

ecology

ecosystem

biome

biotic factor

abiotic factor

autotroph

producer

photosynthesis

chemosynthesis

heterotroph

consumer

carnivore

omnivore

scavenger detrivore

decomposer

food chain

predator

prey

food web

trophic level

biogeochemical cycle

nutrients

cellular respiration decomposition

deposition

sedimentation

combustion

evaporation

condensation

transpiration

precipitation

run off

infiltration ground water

nitrogen fixation

bacteria

assimilation

nitrification

fertilizers

dentification phosphorus

weathering

eutrophication

habitat

niche biome

deciduous forest

tropical rainforest

Science

Grade(s) 10th, Duration 1 Year, 1 Credit Required Course

grassland/ prairie

desert

savanna

taiga

tundra

symbiosis

mutualism

parasitism

commensalism

Materials and Resources (optional)

Link for worksheet for students dissecting owl pellet and relate to food chains and food webs:

https://www.biologycorner.com/resources/Owl Pellet Bone Chart grid.pdf

Link for worksheet for students applying knowledge learned for food chains, food webs and trophic levels:

http://www.crooksville.k12.oh.us/wp-content/uploads/2020/04/7th-Science-Calamity-1.pdf?scrlybrkr=21b17bca

Topic: Food Chains, Food Webs & Biomass Pyramids

Learning Targets

Students will be able to identify relationships among organisms and demonstrate how energy is transferred.

Students will extrapolate components of an ecosystem to identify producers, consumers, decomposers to make food webs and apply to trophic levels.

Learning Targets linked to Priority Standard = 4

Duration: 4 Day(s)

Duration: 2 Day(s)

Duration: 2 Day(s)

Duration: 2 Day(s)

Duration: 3 Day(s)

Duration: 2 Day(s)

Duration: 2 Day(s)

Topic: Carbon Flow through Ecosystem

Learning Targets

Using owl pellet dissections, students will explain how carbon transfers from the producer all the way through to an owl and a decomposer.

Learning Targets linked to Priority Standard = ♣

Topic: Connection of carbon & oxygen flow in ecosystem

Learning Targets

Students will use computer simulations to understand components of the carbon systems in relationship to photosynthesis.

Learning Targets linked to Priority Standard = 🗗

Topic: Biogeochemical Cycle- Water

Learning Targets

Students will relate water cycle terminology and systems as an abiotic source for living things.

Students will identify water properties and explain how these factors relate the the water cycle in ecosystems.

Learning Targets linked to Priority Standard = ♣

Topic: Biogeochemical Cycle- Nitrogen & Phosphorus

Learning Targets

Students will explain relationships of the nitrogen and phosphorus cycle as these factors relate to the exchange of matter in an ecosystem.

Learning Targets linked to Priority Standard = ₽

Topic: Symbiotic Relationships

Learning Targets

Students will discuss and develop examples where relationships exists between different types of organisms in various ecoystems.

Learning Targets linked to Priority Standard = 中

Topic: Coral Reef interaction with marine life

Learning Targets

Students will study and relate how biogeochemical cycles impact coral reefs focusing on the carbon cycle.

Learning Targets

Students will study and research the impact biogeochemical cycles are having on coral reefs.

Learning Targets linked to Priority Standard = ♣

Topic: Biomes Duration: 5 Day(s)

Learning Targets

Science

Grade(s) 10th, Duration 1 Year, 1 Credit Required Course

Students will differentiate between various ecosystems of the world through climate, weather, animal/ plant relationships, resources and genetic diversity of species of each biome.

Learning Targets linked to Priority Standard = ♣

Unit: Changes in Ecosystems with Human Dependence on Earth & Interactions

Duration: 8 Day(s)

Unit Description

Students will study the growth patterns of various organisms which also includes humans. Students will also analyze the impacts humans have on Earth's communities and resources. Special attention is made to the geology and formation of coral and how global warming has affected those aquatic ecosystems.

Academic Vocabulary

population

population density

immigration

emigration

exponential growth

logistic growth

carrying capacity

density dependent growth factors

density independent growth factors

random populations

uniform populations

clumped populations

renewable resources

nonrenewable resources

sustainable development

deforestation

desertification

pollution

biological magnification

smog

acid rain

biodiversity

global warming

climate change

coral bleaching

Topic: Population Ecology

Duration: 3 Day(s)

Duration: 2 Day(s)

Duration: 4 Day(s)

Duration: 10 Day(s)

Learning Targets

Students will determine dependent and independent growth factors and the impacts these factors have on population growth. Data tables & graphs will be analyzed to describe logistic versus exponential growth.

Learning Targets linked to Priority Standard = ♣

Topic: Growth of human population on ecosystems

Learning Targets

Students will graph the population of Tipton versus Columbia and explain factors that have contributed to growth and debate whether humans have reached their carrying capacity.

Learning Targets linked to Priority Standard = 4

Topic: Human activities impact on Earth

Learning Targets

Students will conduct research regarding various human impacts and investigate community members knowledge base regarding these impacts. Issues with the impacts will be addressed as well as solutions.

Learning Targets linked to Priority Standard = ♣

Unit: Earth's History & Formation

Unit Description

This section mainly follows details outlined with DESE and attached documents supplied by Melanie Carden- Jensen looking how layers develop on Earth especially around coral.

Academic Vocabulary

Law of Superposition

Biogeography

Science

Grade(s) 10th, Duration 1 Year, 1 Credit Required Course

Carbon 14 dating Coral Formation Sedimentation

Topic: Plate Tectonics & Law of Superposition

Duration: 2 Day(s)

Learning Targets

Students will relate the formation of coral to how new species are created along an island reef and how they can cahnge due to coral bleaching.

Learning Targets linked to Priority Standard = ♣

Topic: Differences in oceanic rocks (include meteorites)

Duration: 3 Day(s)

Topic: Carbon 14 Dating

Duration: 2 Day(s)

Duration: 10 Day(s)

Learning Targets

Students can relate age of fossils with evidence that relates to common ancestry of organisms found at same time period of Earth's history and how DNA has altered.

Learning Targets linked to Priority Standard = ♣

Topic: Biogeography Duration: 1 Day(s)

Topic Description (short)

Review how plants and animals are related to each other with spacing of geographic distance.

Unit: Common Ancestry & Natural Selection

Unit Description

Natural Selection is based on having traits allow survivability. Students will determine how genetics plays a role in determining how the "fittest" survive.

Academic Vocabulary

Natural Selection

Evolution

Fossils

Artificial Selection

Adaptation

Survival of the Fitness

Biogeography

Homologous Structure

Analogous Structure

Vestigial Structure

Embryology

Gene Pool

Genetic Variation

Reproductive Isolations

Geographic Isolation

Behavioral Isolations

Seasonal Isolations

Topic: Fossil Record Duration: 2 Day(s)

Topic: Patterns of Evolution Duration: 3 Day(s)

Topic: Reproductive Isolations Duration: 3 Day(s)

Topic: Adaptive Radiation **Duration**: 2 Day(s)

Unit: Biodiversity Duration: 10 Day(s)

Unit Description

Students will investigate the characteristics of various living organisms to each kingdom. Students will view specimens and conduct a dissection.

Academic Vocabulary

Biodiversity Taxonomy

Linnea's

Science

Domain

Archaea

Eubacteria

Kingdom

Protist

Fungi

Plantae Animalia

Phylum

Class

Order

Family Genus

Species

Mammalia

Body Symmetry

Asymmetry

Bilateral

Radial

Skeleton

Endoskeleton

Exoskeleton

Vertebrate

Invertebrate

Hydrostatic Skeleton

Body Layers Diploblastic

Triploblastic Body Cavities

Acoelomate

Pseudocoelomate

Coelomate Heterotroph

Autotroph

Topic: Taxonomy & Binomial Nomenclature **Duration:** 2 Day(s)

Topic: Kingdoms & Characteristics **Duration:** 5 Day(s)

Topic: Dissections **Duration:** 3 Day(s)

Grade(s) 10th, Duration 1 Year, 1 Credit

Required Course