

Biology Prioritized Curriculum

- Biology, by Miller and Levine
- Prentice Hall
- Copyright 2006
- Updated July 2011

Course name: Biology	Essential	Important	Nice to Know
CSO# details			
SC.O.B.1.1	X		
SC.O.B.1.2	X		
SC.O.B.1.3	X		
SC.O.B.1.4	X		
SC.O.B.1.5	X		
SC.O.B.1.6	X		
SC.O.B.1.7	X		
SC.O.B.1.8	X		
SC.O.B.1.9	X		
SC.O.B.2.1	X		
SC.O.B.2.2	X		
SC.O.B.2.3	X		
SC.O.B.2.4		X	
SC.O.B.2.5		X	
SC.O.B.2.6	X		

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CSO# details			
SC.O.B.2.7	x		
SC.O.B.2.8		x	
SC.O.B.2.9	x		
SC.O.B.2.10	x		
SC.O.B.2.11	x		
SC.O.B.2.12	x		
SC.O.B.2.13	x		
SC.O.B.2.14		x	
SC.O.B.2.15	x		
SC.O.B.2.16		x	
SC.O.B.2.17	x		
SC.O.B.2.18	x		
SC.O.B.2.19	x		
SC.O.B.2.20	x		
SC.O.B.2.21	x		

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CSO# details			
SC.O.B.2.22	x		
SC.O.B.2.23	x		
SC.O.B.2.24	x		

BIOLOGY CONCEPT MAP

Key Concepts:

Hypothesis

Scientific Method

Characteristics of Life

Scientific Tools

Nature of matter, Water & Carbon Compounds

Chemical Reactions & Enzymes

Estimated days to complete - 15

Topic:
The Nature of Life
Unit 1: Chapters 1 & 2
CSOs: SC.O.B. 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9

Enduring Understanding:
Unit EQ: How will studies of life's smallest systems help us understand the largest biological systems?

Essential Question(s):
What is the scientific method and how is it used by scientists? What are the common tools used by scientists? What are the important safety guidelines to be followed in the lab setting? Name the 3 subatomic particles. Why is water polar? Functions of each group of organic compounds.

Examples:

Pg. 2 Inq. Act.
Pg. 19 Quick Lab

Lab pg. 29
6 characteristics of life

Pg. 34 Inq. Act.
Pg. 37 Careers
Pg. 42 Acids/Bases (NOVAS)

Pg. 49 Demo
Pg. 51 Analyzing Data
Lab pg. 54-55

Key Vocabulary:

Observation Inference

Controlled experiment

Variable Theory

Homeostasis

Cohesion Adhesion

Vander Waals Forces

pH scale, acid, base & buffer

Monomer, polymer

Carbohydrate

Mono Saccharide

Poly Saccharide Lipid

Nucleic acid Nucleotide

RNA DNA

Comments: Teacher/Standardized Tests, ongoing assessment

BIOLOGY CONTENT MAP

Key Concepts:

Estimated days to complete - 10

Key Vocabulary:

Ecology
Energy flow

Topic:
Ecology
Unit 2: Chapters 3-6
SC.O.B.2.20, 2.21, 2.22, 2.23, 2.24

Ecology – exponential growth

Matter (cycles)
Climate

Biosphere – logistic growth

Abiotic/Biotic factors
Biomes

Population –carrying capacity

Ecosystems
Populations
(growth & times)

Enduring Understanding:

Unit EQ: Can our society learn how to produce the food and energy we need while preserving the environment?

Community agriculture

Essential Question(s): How does matter and energy flow through an ecosystem? How do abiotic and biotic factors influence an ecosystem and community? What factors affect & limit characteristics of a population? How are human activities affecting the biosphere? Is there a decline occurring in sustainable areas? What is global change?

Ecosystem – mono culture

Renewable/non-renewable
resources
Biodiversity

Examples:

Inq. Act.	Pg 62
Quick lab	Pg 70
Analyzing data	Pg 79
Real World lab	Pg 81

Inq.lab	pg 118
Analyze data	pg 123
Quick lab	pg 125
Bact. Growth	pg 133

Biome – green revolution
Biodiversity

Autotrophs – genetic diversity

Inq. Act.	Pg 86
Quick lab	Pg 91
Analyzing data	Pg 111
Exploration	Pg 113

Inq. Act	pg 138
Quick lab	pg 153
Analyzing data	pg 158
Lab act.	Pg 161

Heterotrophs-biological
mannification

Trophic levels – global
warming

Ecological pyramid
Biomass

Biogeochemical cycle

Green house effect

Ecological succession

Comments: Ongoing Assessments,
Teacher/ standardized tests

BIOLOGY CONTENT MAP

Key Concepts:

Cell structures and functions

Photosynthesis

Calvin Cycle

Respiration

Glycolysis
Krebs Cycle

Regulation of Cell Cycle

Estimated days to complete - 25

Topic:
Cells
Unit 3: Chapters 7-10
SC.O.B.2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8

Enduring Understanding:

Unit EQ: What are the signals that control cell specialization and can those signals help to stop uncontrolled growth of cancer cells?

Essential Question(s): What is the cell theory? How are eukaryotes & prokaryotes differentiated? What factors affect the rate at which photosynthesis occurs? What 3 pathways does the use to release energy during exercise? What problems does growth cause for cells?

Examples:

Inq. Act. Pg 168
Quick lab Pg 180 & 187
Demo Pg 185
Lab Pg 194 & 195

Inq.lab pg 220
Lab pg 234 & 235
Demo pg 226
Quick lab pg 231

Inq. Act. Pg 200
Quick lab Pg 206
Demo Pg 210
Analyzing data Pg 213

Inq. Act pg 240
Quick lab pg 242
Demo pg 244
Lab. Pg 254 & 255

Key Vocabulary:

Prokaryote cell division

Eukaryote mitosis

Cell theory cytokinesis

Organelle chromatid

Lipid bilayer cell cycle

Diffusion

Osmosis

Equilibrium

Active transport

Endo / Exocytosis

ATP/NADP+/ATP

Photosystem NAD+

Fermentation Anerobic

BIOLOGY CONTENT MAP

Estimated days to complete – 25
for unit

Key Concepts:

Work of Gregor Mendel

Probability &
Punnett Squares

Meiosis

Topic:
Genetics
Unit 4 : Chapter 11
SC.O.B.2.9, 2.10

Enduring Understanding:
Unit EQ: How can humans use genetic engineering wisely and respect the natural environment of the world?

Essential Question(s): How do geneticists use probability to predict inheritance patterns based on the work of Gregor Mendel?

Examples:

Inq. Act. Pg 262
Demo Pg 265 & 277
Lab Pg 268 & 281

Key Vocabulary:

Genetics Probability

True breeding Punnett Square

Trait Homozygous

Hybrid Heterozygous

Gene Genotype

Allele Independent assortment

Segregation Incomplete dominance

Gamete Codominance

Homologous Polygenic traits

Diploid Haploid

Meiosis

Tetrad

Crossing over Gene map

Comments: ongoing assessments, Teacher/standardized test

BIOLOGY CONTENT MAP

Estimated days to complete – 25
for unit

Key Concepts:

DNA / RNA

Protein synthesis

Mutations

Gene regulation

Topic:
Genetics
Unit 4 (continued) : Chapter 12
SC.O.B 2.12, 2.13

Enduring Understanding:
Unit EQ:

Essential Question(s): Explain how RNA and DNA differ.
What is the overall structure of a DNA and RNA model?

Examples:

Inq. Act. Pg 286
Demo Pg 291 & 295

Quick Lab Pg 303 & 307

Demo Pg 298 & 302
Lab Pg 313

Key Vocabulary:

Transformation
Bacteriophage

Base Pairing Chromatin

Histone Replication

DNA Polymerase

mRNA tRNA rRNA

Transcription

RNA Polymerase

Promoter

Entron/Exon Codon

Translation operator

Anticodon HOX

Mutation

Gene

Comments: Ongoing assessment, Teacher/Standardized test

BIOLOGY CONTENT MAP

Estimated days to complete -25
for unit

Key Concepts:

Genetic Engineering

Manipulating DNA

Transformation

Topic:
Genetics
Unit 4 (continued): Chapter 13
SC.O. B. 2.14

Enduring Understanding:
Unit EQ:

Essential Question(s)
How do scientists manipulate DNA? What happens during transformation?

Examples:

Inq. Act. Pg 318
Lab Pg 334 & 335

Science Skills Pg 329

Quick Lab Pg 326

Key Vocabulary:

Selective breeding

Hybridization

Inbreeding

Restriction enzymes

Gel electrophoresis

Recombinant DNA

PCR

Plasmid

Genetic marker

Transgenic

Clone

Comments: Ongoing assessment, teacher/standardized test

BIOLOGY CONTENT MAP

Estimated days to complete – 25
for unit

Key Concepts:

Human Heredity

Human Chromosome

Human Molecular Genetics

Topic:
Genetics
Unit 4 (continued): Chapter 14
SC.O. B. 2.11

Enduring Understanding:
Unit EQ:

Essential Question(s)
How is sex determined? What is X-chromosome inactivation?

Examples:

Inq. Act. Pg 340
Guest Speaker: State
Police and Dr. Wise, CU

Lab Pg 351
Demo Pg 357

Film – Genome Project

Lab Pg 361

Key Vocabulary:

Karyotype

Sex chromosomes

Autosomes

Pedigree

Sex linked gene

Non-disjunction

DNA fingerprinting

Comments: Ongoing assessment, teacher/standardized test

BIOLOGY CONTENT MAP

Key Concepts:

Diversity

Charles Darwin

Evolution of Genetic Change

Fossil record patterns of evolution

Modern evolutionary classification

Estimated days to complete - 8

Topic:
Evolution
Unit 5: Chapters 15-18
SC.O. B.2.15, 2.16, 2.17, 2.18

Enduring Understanding:

Unit EQ: Can evolutionary theory help predict which strains of a virus will be most deadly next year?

Essential Question(s) What were the patterns observed by Darwin on the Galapagos Islands?

What 5 conditions are needed to maintain genetic equilibrium?

What are the divisions of the geologic time scale? How are evolutionary relationships important in classification?

Examples:

Inq. Act. Pg 368
Demo Pg 370 & 377
Lab Pg 379 & 387

Inq. Act. Pg 416
Lab Pg 420 & 441
Demo Pg 449
Analyzing data Pg 438

Inq. Act. Pg 392
Lab Pg 401 & 411
Analyzing data Pg 408

Inq. Act. Pg 446
Demo Pg 449
Quick lab Pg 453
Lab Pg 462 & 463

Key Vocabulary:

Macro evolution
Co-evolution

Fossil

Artificial selection
Natural selection

Vestigial organ Adaptation

Gene pool Relative freq.

Single gene trait

Genetic drift

Hardy – Weinberg principle

Isolations Index fossil

Taxonomy Half-life

Binomial Microfossil

Mass extinction Genus

Phylogeny

BIOLOGY CONTENT MAP

Key Concepts:

Differences in prokaryotes

Identify prokaryotes

Importance of bacteria

Structure of viruses

Viral infection

Estimated days to complete : 5

Topic:
Unit 6: Chapter 19
SC.O.B. 2.19

Enduring Understanding:

Unit EQ-How do bacteria and viruses affect living things?

Essential Question(s):

How are bacteria vital to maintaining the living world?
How do viruses cause disease?

Examples:

Pg. 470 Inq. Activity
Pg. 482 Quick Lab

Pg. 491 Exploration

Pg. 484 Issues
Pg. 487 Careers

Examine bacteria types
with microscopes
Lab: Transmission of
Disease

Key Vocabulary:

prokaryote

chemo-/photo-heterotroph

chemo-/photo-autotroph

coccus, bacillus, spirillum

obligate aerobe/anaerobe,
facultative anaerobe

binary fission, conjugation

endospore

nitrogen fixation

virus

bacteriophage

lysogenic/lytic infection

prophage, retrovirus

Pacing Guide
BIOLOGY
 Updated July 2011

UNIT OF STUDY	SC.S	TIME FRAME	RESOURCES
Major standards covered through the year in all content taught	SC.O.B 1-3	18 weeks	Research paper and/or projects. Lab work as required by textbook and/or other resources
The Nature of Life Chapters 1 and 2	SC.O.B.1.1, 1.2,1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9	3 weeks	Textbook, lab activities with textbook and other resources and demonstrations
Ecology Chapters 3-6	SC.O.B.2.20, 2.21, 2.22, 2.23, 2.24	2 weeks	Textbook, lab activities with textbook, research activity with chapter 6, Treasure Hunt
Cells Chapters 7-10	SC.O.B.2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8	5 weeks	Textbook, lab activities with textbook, demonstrations, research activities with chapter 10 and midterm review and midterm exam
Genetics Chapters 11-14	SC.O.B.2.9, 2.10, 2.11, 2.12, 2.13, 2.14	5 weeks	Textbook, lab activities with textbook, demonstrations, inquiry activity with chapter 14 and research activity with chapter 14
Evolution Chapters 15-18	SC.O.B.2.15, 2.16, 2.17, 2.18	1 1/2 weeks	Textbook, lab activities with textbook, demonstrations, inquiry activity with chapters 16 and 18
Dissections	SC.O. B. 2.4	2 days	Study of the internal and external body structures of various organisms including insects, fishes, and mammals
Bacteria/Viruses	SC.O. B 2.19	1 week	Textbook, lab activities with textbook, Microscope use and disease transmission lab
Technology	SC.O. B 3	18 weeks	Taught throughout semester by using computers, internet activities, calculators with graphing software, NOVA 5000, and all Microsoft Office applications, Smartboard, etc

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