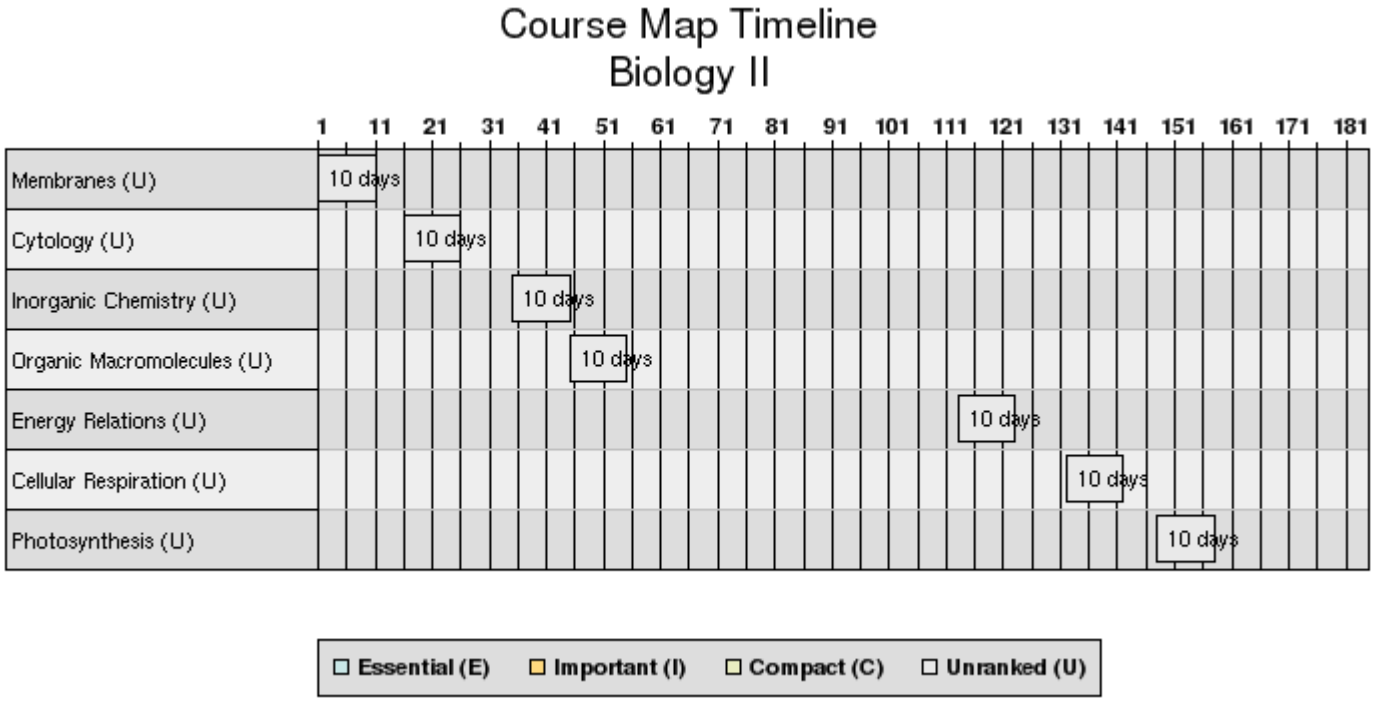
Folder: Science

Group/District: PENNSYLVANIA



Curriculum: COLUMBIA BOROUGH SD Curriculum
PENNSYLVANIA

Course: Biology II
Date: January 23, 2014 ET

Topic: Cellular Respiration
Days: 10

Subject(s):
Grade(s):

Key Learning:
The production of ATP thought cellular respiration couples exergonic reactions to endergonic reactions in living things.

Unit Essential Question(s):
How is are molecules of glucose oxidized to produce ATP?

Concept: glycolysis and fermentation	Concept: kreb's cycle	Concept: electron transport
Lesson Essential Question(s): Why is pyruvic acid considered the hub of respiration? (A)	Lesson Essential Question(s): Why is the Kreb's cycle considerd the energy wheel of respiration? (A)	Lesson Essential Question(s): What is the chemosmotic theory of cellular respiration? (A)
Vocabulary: glycolysis, fermentation, oxidative phosphorylation, substrate level phosphorylation	Vocabulary: acetyl coA, NAD+, FAD	Vocabulary: cytochrome, thermogenesis, hexose monophosphate shunt, Beta oxidation

Additional Information:

Attached Document(s):

Vocab Report for Topic: Cellular Respiration Days: 10
Subject(s): Grade(s):

Concept: glycolysis and fermentation

glycolysis -
fermentation -
oxidative phosphorylation -
substrate level phosphorylation -

Concept: kreb's cycle

acetyl coA -
NAD+ -
FAD -

Concept: electron transport

cytochrome -
thermogenesis -
hexose monophosphate shunt -
Beta oxidation -

Curriculum: COLUMBIA BOROUGH SD Curriculum | PENNSYLVANIA

Course: Biology II | Date: January 23, 2014 ET

Topic: Cytology | Days: 10

Subject(s): Science | Grade(s): 11th, 12th

Key Learning:

The cell is the basic unit structure of all living things.

Unit Essential Question(s):

If all living organisms are comprised of cells, what causes the diversity in structure and function relationships within an organisms?

Concept: cell types	Concept: viruses	Concept: cellular organelles
S11.B.1.1.2, S11.B.1.1.1, S11.A.1.1.4, S11.A.1.1.5, S11.A.1.1.1, S11.A.2.2.2, S11.B.2.1.1	S11.A.1.1.4, S11.A.1.1.5, S11.A.2.2.2, S11.A.2.2.1	S11.B.1.1.3, S11.B.1.1.1, S11.A.1.1.5, S11.A.3.2.3, S11.A.1.1.1, S11.A.2.2.2, S11.B.2.1.1
Lesson Essential Question(s): What differences exist between prokaryotic and eukaryotic cells? (A)	**Lesson Essential Question(s):** How are viruses types distinguished from each other? (A)	**Lesson Essential Question(s):** Within a cell, what are the specialized components and their specific function? (A)
Vocabulary: conjugation, transformaton, plasmids, prokaryotic, eukaryotic, archaebacteria	**Vocabulary:** capsid, nucleic acid, lytic, lysogenic	**Vocabulary:** Golgi apparatus, endoplasmic reticulum, nucleus, lysosomes, ribosomes, chloroplast, vacuole, mtiochondria

Additional Information:

Attached Document(s):

Vocab Report for Topic: Cytology Days: 10
Subject(s): Science Grade(s): 11th, 12th

Concept: cell types

conjugation -
transformaton -
plasmids -
prokaryotic -
eukaryotic -
archaebacteria -

Concept: viruses

capsid -
nucleic acid -
lytic -
lysogenic -

Concept: cellular organelles

Golgi apparatus -
endoplasmic reticulum -
nucleus -
lysosomes -
ribosomes -
chloroplast -
vacuole -
mtiochondria -

Curriculum: COLUMBIA BOROUGH SD Curriculum

PENNSYLVANIA

Course: Biology II

Date: January 23, 2014 ET

Topic: Energy Relations

Days: 10

Subject(s): Science

Grade(s): 11th, 12th

Key Learning:

Endergonic reactions are driven by exergonic reactions in living systems.

Unit Essential Question(s):

How are endergonic reactions to proceed in living things?

Concept:	Concept:
thermodynamic relationships S11.C.1.1.2, S11.C.1.1.3, S11.C.1.1.6, S11.C.2.1.2, S11.C.2.1.3, S11.B.1.1.3, S11.B.1.1.2, S11.B.1.1.1	**enzymes** S11.C.1.1.2, S11.C.1.1.3, S11.C.2.1.1, S11.C.2.1.2, S11.C.2.1.3, S11.B.1.1.3, S11.B.1.1.2, S11.B.1.1.1
Lesson Essential Question(s): How do the Thermodynamic Laws relate to energy relations in living things? (A)	Lesson Essential Question(s): How do enzymes control metabolic processes n living things? (A)
Vocabulary: entropy, enthalpy, exergonic, endergonic, bioenergetics	Vocabulary: catalysts, allosteric, apoennzyme, holoenzyme,

Additional Information:

Attached Document(s):

Vocab Report for Topic: Energy Relations Days: 10
Subject(s): Science Grade(s): 11th, 12th

Concept: thermodynamic relationships

entropy -
enthalpy -
exergonic -
endergonic -
bioenergetics -

Concept: enzymes

catalysts -
allosteric -
apoennzyme -
holoenzyme -
-

Curriculum: COLUMBIA BOROUGH SD Curriculum PENNSYLVANIA

Course: Biology II Date: January 23, 2014 ET

Topic: Inorganic Chemistry Days: 10

Subject(s): Science Grade(s): 11th, 12th

Key Learning:

Review of the properties and behavior of inorganic compounds.

Unit Essential Question(s):

How does atomic structure determine the chemical characteristics of substances?

Concept: Atomic Structure	Concept: Acids and Bases	Concept: Characteristics of Water
S11.C.1.1.1, S11.C.1.1.2, S11.C.1.1.3, S11.C.1.1.4, S11.C.1.1.6	S11.C.1.1.1, S11.C.1.1.2, S11.C.1.1.3, S11.C.1.1.4	S11.C.1.1.1, S11.C.1.1.2, S11.C.1.1.3, S11.C.1.1.4
Lesson Essential Question(s): How does atomic structure determine the chemical characteristics of an element? (A)	Lesson Essential Question(s): How do we distinguish between acids and bases? (A)	Lesson Essential Question(s): Why does water exhibit unique physical, chemcial and mechanical characteristcs? (A) Why does water exhibit unique physical, chemcial and mechanical characteristcs? (ET) How does the structure of water accounting for the physical, mechanical, and chemical properties of water? (A)
Vocabulary: isotopes, ions, valence, oxidation, ionic, covalent	Vocabulary: proton, buffers, amphoteric	Vocabulary: specific heat, cohesion, adhesion

Additional Information:

Attached Document(s):

Vocab Report for Topic: Inorganic Chemistry Days: 10
Subject(s): Science Grade(s): 11th, 12th

Concept:

Atomic Structure

isotopes -
ions -
valence -
oxidation -
ionic -
covalent -

Concept:

Acids and Bases

proton -
buffers -
amphoteric -

Concept:

Characteristics of Water

specific heat -
cohesion -
adhesion -

Curriculum: COLUMBIA BOROUGH SD Curriculum | PENNSYLVANIA

Course: Biology II | Date: January 23, 2014 ET

Topic: Membranes | Days: 10

Subject(s): Science | Grade(s): 11th, 12th

Key Learning:

Selectively permeable lipid bilayers found in all cells are composed primarily of proteins and lipids and are involved in a vast array of cellular processes.

Unit Essential Question(s):

What is the importance served by plasma membranes in living systems?

Concept: plasma membranes S11.B.1.1.1, S11.B.1.1.2, S11.B.1.1.3	Concept: membrane transport S11.B.1.1.3, S11.B.2.1.2	Concept:
Lesson Essential Question(s): How does the structure of the plasma membrane relate to metabolic needs of the cell? (A)	**Lesson Essential Question(s):** How are materials transported through plasma membranes? (A)	**Lesson Essential Question(s):** (A)
Vocabulary: hydrophobic, hydrophilic, glycocalyx, phospholipid, cholesterol	**Vocabulary:** diffusion, osmosis, active transport, molal, molar, endocytosis, exocytosis, hypotonic, hypertonic	**Vocabulary:**

Additional Information:

Attached Document(s):

Vocab Report for Topic: Membranes Days: 10
Subject(s): Science Grade(s): 11th, 12th

Concept: plasma membranes

hydrophobic -
hydrophilic -
glycocalyx -
phospholipid -
cholesterol -

Concept: membrane transport

diffusion -
osmosis -
active transport -
molal -
molar -
endocytosis -
exocytosis -
hypotonic -
hypertonic -

Curriculum: COLUMBIA BOROUGH SD Curriculum | PENNSYLVANIA

Course: Biology II | Date: January 23, 2014 ET

Topic: Organic Macromolecules | Days: 10

Subject(s): Science | Grade(s): 11th, 12th

Key Learning:

Organization distinquishes organic molecules from inorganic molecules.

Unit Essential Question(s):

What molecular structures distinguish various organic molecules?

Concept: hydrocarbons	Concept: functional groups	Concept: carbohydrates
S11.B.1.1.2, S11.B.1.1.3, S11.C.1.1.2, S11.C.1.1.3	S11.B.1.1.2, S11.B.1.1.3, S11.C.1.1.2, S11.C.1.1.3	S11.B.1.1.2, S11.C.1.1.2, S11.C.1.1.3
Lesson Essential Question(s): What is the basic hydrocarbon structure and identify the series to decane. (A)	**Lesson Essential Question(s):** What are the different types of organic functional groups and their associated characteristics? (A)	**Lesson Essential Question(s):** How do we distinguish between the different types carbohydrates and how their function of critical to all living things? (A)
Vocabulary: isomer, allotropic, alkyl groups, alkanes, alkenes, alkynes, arenes	**Vocabulary:** alchohol, ketone, ether, aldehydye, amide, amine, organic acid, ester	**Vocabulary:** monosaccharides, disaccharide, polysaccharide, oligosaccharide, glycogen

Concept: lipids	Concept: proteins	Concept: nucleic acids
S11.B.1.1.2, S11.B.1.1.3, S11.C.1.1.2, S11.C.1.1.3	S11.B.1.1.2, S11.B.1.1.3, S11.B.2.2.1, S11.A.2.1.4, S11.A.2.1.5, S11.A.3.1.1, S11.A.3.1.3, S11.C.1.1.2, S11.C.1.1.3	S11.B.1.1.2, S11.B.1.1.3, S11.B.2.2.1, S11.A.2.1.4, S11.A.3.1.1, S11.A.3.1.3, S11.C.1.1.2, S11.C.1.1.3, S11.A.2.1.5
Lesson Essential Question(s): How do we distinguish between the different types lipids and how their function of critical to all living things? (A)	**Lesson Essential Question(s):** How do we distinguish between the different types proteins and how their function of critical to all living things? (A)	**Lesson Essential Question(s):** How do we distinguish between the different types nucleic acids and how their function of critical to all living things? (A) S11.A.2.1.5
Vocabulary: saponification, triglyceride, derived lipids, lipoproteins,	**Vocabulary:** keratin, peptide bond, denaturation, zwitterions, amino acid, collagen,	**Vocabulary:** transcription, translation, deamination, polymerase, nucleotide, redundancy, monocistronic

Additional Information:

Attached Document(s):

Vocab Report for Topic: Organic Macromolecules Days: 10
Subject(s): Science Grade(s): 11th, 12th

Concept: hydrocarbons

isomer -
allotropic -
alkyl groups -
alkanes -
alkenes -
alkynes -
arenes -

Concept: functional groups

alchohol -
ketone -
ether -
aldehydye -
amide -
amine -
organic acid -
ester -

Concept: carbohydrates

monosaccharides -
disaccharide -
polysaccharide -
oligosaccharide -
glycogen -

Concept:

lipids

saponification -
triglyceride -
derived lipids -
lipoproteins -
-

Concept: proteins

keratin -
peptide bond -
denaturation -
zwitterions -
amino acid -

Vocab Report for Topic: Organic Macromolecules Days: 10
Subject(s): Science Grade(s): 11th, 12th

collagen -
-

Concept: nucleic acids

transcription -
translation -
deamination -
polymerase -
nucleotide -
redundancy -
monocistronic -

Curriculum: COLUMBIA BOROUGH SD Curriculum
PENNSYLVANIA

Course: Biology II
Date: January 23, 2014 ET

Topic: Photosynthesis
Days: 10

Subject(s): Science
Grade(s):

Key Learning:
Photosynthesis is the most fundamental biochemical process on the earth.

Unit Essential Question(s):

Why is photosynthesis considered the most important biological process on the earath?

Concept: photosynthetic pigments	Concept: light reactions	Concept: dark reactions
S11.C.1.1.2, S11.C.1.1.3, S11.C.2.1.1, S11.C.2.1.2, S11.B.1.1.2, S11.B.1.1.3	S11.C.1.1.2, S11.C.1.1.3, S11.C.2.1.1, S11.C.2.1.2, S11.B.1.1.2, S11.B.1.1.3	S11.C.1.1.2, S11.C.1.1.3, S11.C.2.1.2, S11.B.1.1.2, S11.B.1.1.3
Lesson Essential Question(s): What are the basic photosynthetic pigments and what is their importance to living systems? (A)	Lesson Essential Question(s): How is photochemical energy captured by green plants? (A)	Lesson Essential Question(s): How is carbon fixed into glucose? (A)
Vocabulary: caroteniods, chlorophyll, action spectrum, absorption spectrum,	Vocabulary: cyclic photophosphorylation, non cyclic photophosphorylation	Vocabulary: Hatch-Slack pathway, Calvin Cycle

Additional Information:

Attached Document(s):

Vocab Report for Topic: Photosynthesis Days: 10
Subject(s): Science Grade(s):

Concept: photosynthetic pigments

caroteniods -
chlorophyll -
action spectrum -
absorption spectrum -
-

Concept: light reactions

cyclic photophosphorylation -
non cyclic photophosphorylation -

Concept: dark reactions

Hatch-Slack pathway -
Calvin Cycle -