

Biology

Science

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

Course Overview

GENERAL DESCRIPTION: Students will continue to study the world of living things. Emphasis is placed on the characteristics of living things, their cellular functioning and maintenance, and the process of change in organisms. Students will also study specific living systems, kingdoms and human biology.

HOMEWORK OR READING NECESSARY: Weekly Latin quizzes, daily reading assignments and long-term review assignments.

FORMAT: Lecture, discussion, daily work, and lab work with varying combinations in format depending upon the topic.

PROJECTS, REPORTS, PAPERS: Students will complete daily assignments, weekly Latin quizzes, quarterly article reviews, hands-on lab exercises and projects as directed.

TESTS: Periodic major tests, as well as other tests and quizzes. Good test preparation is needed.

Timeframe	Unit	Scope And Sequence	
			Instructional Topics
2 Week(s)	What Is Science?		1. What is science 2. Measurement 3. The scientific method 4. Science reporting
3 Week(s)	Chemistry of Life		1. The Periodic Table 2. The Chemistry Packet
3 Week(s)	Environment/Ecology		1. The Biosphere 2. Ecosystems & Communities 3. Populations 4. Humans in the Biosphere
4 Week(s)	Cell Structure & Function		1. Cell Structure & Function 2. Photosynthesis 3. Cellular Respiration & Fermentation 4. Cell Growth & Reproduction
3 Week(s)	Genetics		1. Genetics 2. Protein synthesis
5 Week(s)	Evolution & Natural Selection		1. Natural selection 2. Taxonomy 3. History of Life
9 Week(s)	The Human Body		1. Human Biology
Ongoing	Article Review		1. First Quarter Article 2. Second Quarter Article 3. Third Quarter Article 4. Fourth Quarter Article
Ongoing	Latin Quizzes		1. Root word vocabulary

Materials and Resources

Miller/Levine Biology. Pearson 2010

Course Details

Unit: What Is Science?

Duration: 2 Week(s)

Unit Overview

What is science? What is science not?

How is science done?

How is science reported?

Materials and Resources

Textbook, teacher lecture

Summative Assessment

Rubrics, teacher observation

Topic: What is science

Duration: 2 Day(s)

Learning Targets

Students should understand what science is and what science is not.

Students should understand the rules by which science is done and reported.

Topic: Measurement

Duration: 1 Day(s)

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Topic Overview

Students will use tools to measure.

Learning Targets

Measuring

Students will use tools to measure accurately.

Topic: The scientific method

Duration: 1 Day(s)

Topic Overview

Steps to the scientific method.

Learning Targets

Scientific Method

Students will refine their current understanding of the scientific method to reflect the standard for this course.

Topic: Science reporting

Duration: 1 Day(s)

Topic Overview

Science reports

Credibility of measurement

Peer review

Media reporting

Learning Targets

Evaluating sources of information

Students will develop critical thinking as they approach reports of scientific "breakthroughs", and will generate accurate reports of class findings.

Unit: Chemistry of Life

Duration: 3 Week(s)

Unit Overview

Atoms

Molecules

The Chemistry Packet

Atomic Bonding

Topic: The Periodic Table

Duration: 1 Week(s)

Topic Overview

Students will be able to read and understand the periodic table in order to explain and predict basic chemical interactions.

Learning Targets

Students will understand the basic building blocks of our universe and therefore, themselves.

Topic: The Chemistry Packet

Duration: 1 Week(s)

Topic Overview

Practicing the ability to read the periodic table to make predictions about characteristics of each element and how they interact together.

Learning Targets

Students will be able to read and use the periodic table.

Unit: Environment/Ecology

Duration: 3 Week(s)

Unit Overview

The Biosphere

Ecosystems & Communities

Populations

Humans in the Biosphere

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Topic: The Biosphere

Duration: 5 Day(s)

Topic Overview

Components of Gaia

Learning Targets

Students will understand that all known life occurs only in, on, and around planet Earth.

Topic: Ecosystems & Communities

Duration: 4 Day(s)

Topic Overview

Specifics of Earthly habitats.

Learning Targets

Students will recall specific parameters of ecological communities.

Topic: Populations

Duration: 4 Day(s)

Learning Targets

Students will recall parameters which influence populations.

Topic: Humans in the Biosphere

Duration: 2 Day(s)

Learning Targets

Students will understand how data give us a view in to how we as a species affect all ecosystems.

Unit: Cell Structure & Function

Duration: 4 Week(s)

Unit Overview

Cell Structure & Function
Photosynthesis
Cellular Respiration & Fermentation
Cell Growth & Reproduction

Topic: Cell Structure & Function

Duration: 5 Day(s)

Learning Targets

Students will recall and present the structure of the cell and the functions of cellular components.

Topic: Photosynthesis

Duration: 5 Day(s)

Learning Targets

Students will demonstrate understanding of the light/pigment and biochemical pathway interactions in the process of photosynthesis.
Students will recall that chloroplasts are descendants of free-living cyanobacteria and that some organelles of cells at on time were free-living cells.

Topic: Cellular Respiration & Fermentation

Duration: 5 Day(s)

Learning Targets

Students will recall the physiological processes of glycolysis, fermentation, and areobic respiration.

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Topic: Cell Growth & Reproduction

Duration: 5 Day(s)

Learning Targets

Students will recall characteristics of chromosomes, mitosis, and meiosis.

Unit: Genetics

Duration: 3 Week(s)

Unit Overview

Introduction to Genetics
DNA
RNA & Protein Synthesis
Human Heredity
Genetic Engineering

Topic: Genetics

Duration: 5 Day(s)

Learning Targets

Students will recall the mechanisms of biological heredity.

Topic: Protein synthesis

Duration: 4 Day(s)

Learning Targets

Students will restate the steps of transcription, translation, and protein folding.

Unit: Evolution & Natural Selection

Duration: 5 Week(s)

Unit Overview

Darwin & Wallace's Theory of biological evolution
Evolution of populations
Classification
History of life

Topic: Natural selection

Duration: 9 Day(s)

Learning Targets

Students will recognize the processes of natural selection as environments act upon phylogenies.

Topic: Taxonomy

Duration: 3 Day(s)

Learning Targets

Students will practice naming and classification of organisms using binomial nomenclature and genetic/phylogenetic comparisons.

Topic: History of Life

Duration: 2 Day(s)

Learning Targets

Students will become privvy to evidence of the history of the earth and it's living organisms and the universe as a whole.

Unit: The Human Body

Duration: 9 Week(s)

Unit Overview

The Skeletal System
The Brain & Nervous System
The Digestive System
The Reproductive System

Topic: Human Biology

Duration: 9 Week(s)

Topic Overview

Students will explore and recall the functioning of human body systems.

Learning Targets

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Students will explore and recall the functioning of human body systems.

Unit: Article Review

Duration: Ongoing

Unit Overview

Each quarter students must complete a review of selected articles according to the rubric and list found on Blackboard.

Materials and Resources

iPad
Internet resources
BlackBoard

Academic Vocabulary

ARTICLE REVIEW ASSIGNMENT RUBRIC

* Paper must be typed. Non-typed papers will not be accepted. Spacing by choice. No reviews will be accepted after the due date - for any reason - so do them early.

* Bibliographic data from article must be listed at the top of the paper and follow the following model: [5 points]. These can be copied directly from the quarterly list.

* Avoid personal pronouns. This is a technical paper. Latin names should be italicized with genus capitalized and species in lowercase.

* Proofread!

Author's last name, First initial. " Article title". Journal title. vol. #. no. #. Month/year. page.

5 points - Section ONE – Topic Paragraph
- Review of article topic. Be specific.

5 points - Section TWO - Body
- Who, what, when, where, how.
- Cover the entire text of the article. Points will be deducted
- What new information or ideas have been discussed?
- Review supporting details to the topic.
- Summarize techniques used.

10 points - Section THREE – Paragraph of Relevance
- How does this article affect you economically, health, career, or other interest? (Required)
- Importance of article to others. (Secondary)

One point will be deducted from the total for each grammatical error contained in your review.

Due the Friday of the 8th Week of each grading period for both the required and any extra credit reviews.

No reviews accepted late!

If no review is submitted the student grade will be changed to failing unless the credit recovery plan is followed.

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Summative Assessment

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Topic: First Quarter Article

Duration: 9 Week(s)

Learning Targets

Article Review

- Select & read secondary research article from provided list of several.
- Write review according to MLA format.
- Review should include specific components from provided rubric.
- Review must conform to a rigid deadline.

Topic: Second Quarter Article

Duration: 9 Week(s)

Topic: Third Quarter Article

Duration: 9 Week(s)

Topic: Fourth Quarter Article

Duration: 9 Week(s)

Unit: Latin Quizzes

Duration: Ongoing

Unit Overview

The first day of each school week students are to memorize 10 latin roots & definitions and research a sample compound word and its definition for each root.

Materials and Resources

- iPad
- BlackBoard
- Dictionary

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Academic Vocabulary

Latin list 1

- 1) bio- life
- 2) -ology the study of
- 3) macro- large
- 4) micro- small
- 5) -scope see, view
- 6) mono- one
- 7) bi- two
- 8) di- two
- 9) tri- three
- 10) tetra- four

Latin list 2

glyc- sweet
iso- equal
lip- fat
-lyt, dissolvable
poly- many
sacchar- sugar
syn- together
cyt- cell
endo- within
inter- between

Latin list 3

alto- high
arthro- jointed
avi- flight
caudo- tail
cephalo- head
chondro- bony
crypto- hidden
deca- ten
dino- terrible
donto- teeth

Latin list 4

kilo- 1000
habit- place, dwelling
luni- moon
fune- death
astr- star
homo- same
Homo- man, mankind
hydro- water
hyper- above or over
hypo- below or under

Latin list 5

brady- slow
diastol- a dialation
leuko- white
-gram- something written
agglutin- to glue together
-osis, diseased condition,
to increase
stasis- a halting, steady
thromb- a clot
nutri- nourishing
embol- a stopper

Latin list 6

agri- field
litori- shore

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limno- stream(freshwater)
stagni- standing
arid- dry
aqua- water
marin- of the ocean
caverni- cave
spel- cave
geo- earth

Latin list 7
pyro- fire
pons- bridge
pod- foot
port- to carry
pre- to come before
poly- many
pneumo- lung
poli- gray
post- coming behind,
following
psycho- of the mind

Latin list 8
arbor- tree
dendro- tree
eco- house
humidi- moisture
tempor- time
archaeo- ancient
umbri- shade
flori- flower
spini- thorn or spine
foli- leaf

Latin list 9
melano- black
cyano- blue
chloro- green
erythro- red
rubi- red
iodo- violet
alb- white
leuco- white
xantho- yellow
ferro- iron

Latin list 10
a- lack of, without
ab- from, away from
ac- toward
ad- toward
af- toward
-al, relating to
-algia, pain
ambi- both
amphi- on both sides, in
two ways
amyl- starch

Latin list 11
ante- before
anti- against
aqua- water
arachne- a spider or a
spider's web
arthro- joint
-ase, enzyme

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asper- rough, difficult
aur- ear
baro- pressure
bi- two or twice

Latin list 12
bolus - a clod, a throw
brachio- arm
branchia- gills
caecus- blind
callosum- hard
calor- heat
capillus- a hair or minute tube
carnal- flesh
cata- down
cauda- tail

Latin list 13
cephal- head
chromo- color
chronos- time
-cidal, killing
cili- hair
cine- motion
circum- around
com- with
con- with
contra- opposite

Latin list 14
corpus- body
cyt- cell
de- down, not
-dendro- tree
-derm- skin
di- two
dia- through
dis- apart from, negative
dyn- power
dys- bad

Latin list 15
-ectomy, removal
ef- out
em- in
-emia, blood
endo- inner, within
enter- intestine
epi- upon
equus, horse
erg- work
ex- out

Latin list 16
extra- outside
fract- break
gala- milk
ganglion, swelling or enlargement
gastro- stomach
gen- producing
-glia- glue
glob- ball
glosso- tongue
glyco- sugar

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Latin list 17

gracilis, slender, thin
-gram- letter or record
-graph- writing
gutter- throat
-gyn- woman
hemato- blood
hemo- blood
hemi- 1/2
hepato- liver
hetero- varied

Latin list 18

hippo- horse
homo- same
Homo- man, mankind
hyal- glass-like
hydro- water
hyper- above or over
hypo- below or under
hyster- uterus, womb
-ic, pertaining to
in- in or into

Latin list 19

infer- below
infra- below
inter- between
-itis, inflammation
-ject- throw
kilo- one thousand
kin- moving
labi- lip
lac- milk
leuco- white

Latin list 22

lipo- fat
litho- stone
-ology, knowledge or study
luna, moon
lympho- water
-lysis, dissolving
macro- large
mal- bad
melan- black
meg- large

Latin list 23

men- month
meter- measure
micro- small
mono- one
morpho- body, shape, form
motor- motion
multi- many
mus- mouse
myo- muscle
natus- birth

Latin list 24

necro- death
neph- kidney
neuro- nerve

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nigra- black
-onomy, the science of
-oid, like
opia- sight
opthal- eye
ortho- straight
-osis, morbid, disease

Latin list 25
osteo- bone
-otomy, cutting into
ovi- egg
para- beside
patho- disease
pector- chest
ped- a foot (Latin)
ped- a child (Greek)
peri- around
phago- eating

Latin list 26
phil- loving
phleb- vein
phobia- fear
physio- nature
pius, tender or kind
pneumo- lung
-pod- foot
poly- many
-port- to carry
post- behind, after

Latin list 27
pre- before
proto- first
pseudo- false
psycho- mind
pulmo- lung
pyro- fire
re- back
rectus- straight
retro- backward
renal, kidney

Latin list 28
rhino- nose
rubro- red
sapien- wise
-scope- vision
semi- half
-sis, condition
-some- body
-stasis- slowing
stell(a)- star
strata- layer

Latin list 29
stria- stripe
sub- below
super- above
syn- together
tax- arrangement
tele- far
thermo- heat
thrombo- clot

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tox- poison
trans- across

Latin list 30
-trophy- food, nourishment
tuber- knob
tympanum, drum
-ule, small
ultra- beyond
un- not
vagari- wandering
vaso- vessel
venter- belly
vermis- worm

Latin list #31
alto- high
archaeo- ancient
arthro- jointed
avi- flight
brachio- arm
campy- bent
bene- good/well
herb- plants
-ous quality/state
-tion quality/state

Latin list #32
navicular – boat shaped
mal- bad
serratus – saw toothed
chirus – hand
coelo- hollow
boreal – northern
conical – cone shaped
corytho- helmet
cerato- horn
cetio- whale

Latin list 33
deca- ten
derma- skin
dino- terrible
donto- teeth
dorso- back
erecto- upright
gastro- stomach
gnathos- jaw
hepta- seven
jaundice- yellow

Latin list 34
mimus- imitator
nano- dwarf
octo- eight
orintho- bird
ovi- egg
pachy- thick
penta- five
raptor- thief
rex- king
torso- body

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Latin list 35
com- together
con- together
cor- together
contra- opposite
cutaneous- referring to the skin
dactyl- finger or toe
dis- separation, taking apart
extra- beyond, outside of
fore- before, in front
gen- origin

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Summative Assessment

Weekly quizzes

Topic: Root word vocabulary

Duration: Ongoing

Learning Targets

Vocabulary
