Integrated Science II

Science
NCAA Approved

Grade(s) 9th - 12th, Duration 1 Semester, 1 Credit
Required Course

Description

Integrated Science II is a science class in which covers the remaining standards not taught in Integrated Science I. This class reinforces and expands students understanding and application of the scientific method while they learn about microbiology. Units on cell structure/chemical processes and genetics integrate biology and chemistry. While Units on classification and anatomy compare structure/function of invertebrates, reptiles, amphibians, and mammals. In addition a human anatomy body systems section helps students understand their own body. An ecology unit helps connect all the sections together. Concepts of ecology are also integrated throughout each unit.

Scope And Sequence

Timeframe	Unit	Instructional Topics
2 Day(s)	Classification of Living Things	1. Classification/Microbes Reading
4 Week(s)	Scientific Method/ Microbiology	1. Microbiology 2. Scientific Method
2 Week(s)	Cells	1. Organelle Introduction Jigsaw 2. 4x6 Cell Organelle Cards (12) 3. Build a cell representation 4. Explain and demonstrate cellular processes 5. Protein Synthesis 6. Cellular processes and organelles exam
4 Week(s)	Genetics	1. Daily 10- The Stuff of Life comic book 2. Vocab Match Up 3. Mitosis Vocabulary List 4. Meiosis Vocabulary List 5. Mitosis Lab 6. Genetics Basics and Beyone Online Tutorial 7. Mendel & Genetics 8. Genetic Disease Research Paper 9. Heredity, punnet squares, and Probablility 10. Natural Selection 11. Theory of Evolution 12. Famous Tumors 13. Exam
4 Week(s)	Anatomy and Dissections	1. Students and teachers Body Systems Assignment 2. Animal Dissections 3. Taxonomic Classification 4. Anatomy and Dissection Exam
3 Week(s)	Ecology	1. Food Webs 2. Nitrogen and Carbon cycles 3. Biomes jigsaw 4. Ecosystems
4 Day(s)	Cumulative Final Review and Exam	1. Review Sheet

Materials and Resources

1. Stereo and Compound Microscopes
2. Dissection kits + dissection animals
3. Slides
4. Biology (Holt McDougal) By: Dr. Stephen Nowicki
5. Computers and iPads

Prerequisite (What do you need to take before this)

1. The student must have passed Integrated Science I or another equivalent science course from another school
2. Student must be in 10th grade or have a recommendation from the 9th grade science instructor.

Postrequisite (Allows you to take these courses)

All advanced science classes at Mt. Edgecumbe High School (an advanced science includes any class other than Integrated Science I and II

Location

Room 141

Course Details

Unit: Classification of Living Things **Duration:** 2 Day(s)

Description

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This is the explanation of how living things are classified. From large groups of things down to individual specific species. Class discussion on what do they recall of classification. Write on the board the basic classification of life, have table groups come up with a mnemonic device to remember the order. Complete a reading guide from the text that reinforces and gives history behind classification. The reading guide is from the text Interactive Reader Section 17.4 Domains and Kingdoms pages 292-294.

Essential Questions

How is life classified?
What are the main groups that life is classified into?

Assessments

Content included in the Scientific Method/Microbiology Unit Test

Resources

Biology (Holt McDougal) By: Dr. Stephen Nowicki

Vocabulary

Kingdoms: Archaea, Bacteria, Protista, Fungi, Plantae, Animalia
Phylum
Class
Order
Family
Genus
Species
Domain
Eukaryote
Prokaryote

Topic: Classification/Microbes Reading **Duration:** 2 Day(s)

Knowledge/Skills linked to Power Standard =

Unit: Scientific Method/ Microbiology

Duration: 4 Week(s)

Description

In this unit, students use the scientific method to explore the topic of microbiology. Also introduced in this unit are the taxonomy of all living things; Kingdom, Phylum, Class, Order, Family Genus and species.

MEHS Standard 1: Scientific Method and Experimental Design
MEHS Standard 6: Ecosystems: Cycles of Nature and Human Impacts
MEHS Standard 7: Life Structures and processes

Essential Questions

How can the scientific method be used to answer questions? What role do microbes (viruses, bacteria, protozoa) play in our world?

Assessments

· Scientific Report Format

· Exam

· Hypothesis worksheet

· Experimental design worksheet

· Bacteria and Protozoa lab worksheet

Resources

Parasites Eating Us Alive video
October Skies movie
Kari Lundgren R.N., or other expert from the health field

Vocabulary

· Hypothesis

· Data

· Results

· Conclusion

· Independent and dependent variable

· Experimental group

· Control group

· Coccus

· Spirillium

· Bacillus

Topic: Microbiology **Duration:** 2 Week(s)

Description

Throughout the scientific method, students will become experts in microbiology. Students will first complete labs on bacteria, protozoans, and fungi. Then they will take this information and form their own questions and hypothesis about the microbes on the MEHS campus. They will conduct their own scientific experiment, analyze the results and write it up in the scientific report format.

The following documents are the ones used in this section of the Unit and can be found at the link below:
Bacteria.ppt
Bacteria_note guide.ppt
Bacteria Lab Commercial Slides.doc
Protozoan Types with notes.ppt
Protozoan Information and Lab Work.doc
Fungi-notes.ppt
Fungi Note Taking Guide.doc
FungiLab.doc
Bacteria Investigation.doc

Films:
Hunting the Nightmare Bacteria.doc
The Trouble with Antibiotics.doc
Parasites Eating Us Alive.doc

https://drive.google.com/folderview?id=0B6_wvnghrjeRfk1BV2xnTklXVDNtQ0dyU0Zsc20wcHZvcjM4a0dKSU1TVEN1LUJUM3JNRHc&usp=sharing

Knowledge/Skills

Active listening
Assessment: Students take notes while listening to a lecture from a guest speaker

Observation and analysis
Assessment: Students complete data records and graphs about the bacteria colonies they observe and analyze.

Protists and Fungi Introduction.
Description: Read about and observe under a microscope 4 different types of protists. We will learn the differences between Animal-like protists, Plant-like protists and fungi-like protists.

Knowledge/Skills linked to Power Standard = ✣

Topic: Scientific Method **Duration:** 2 Week(s)

Description

Students practice the different steps of the Scientific Method through a series of activities. Then they put it all together by performing two experiments about microbiology to understand the process of the scientific method. After doing the experiments they write up a full scientific report.

Students start off by making a set of nine cards with the steps of the scientific method steps on them. They use these throughout the unit as a sorting game, but also as a vocabulary guide.

The following documents are the ones used in this section of the Unit and can be found at the link below:
ifthenpracticeISII.doc
Experimental Design Practice2.doc
Practice Making Graphs and Conclusions.doc
Scientific Report Format ISII update.doc
Scientific Report Edit Form.doc
SM_Microbiology_Unit_SG.doc
SM_Microbiology_SG_jeopardy.doc
SM_Microbiology_Unit_Exam.doc

https://drive.google.com/folderview?

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Science | Grade(s) 9th - 12th, Duration 1 Semester, 1 Credit
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Knowledge/Skills

Experimentation utilizing the scientific method
Assessment: Scientific report
Experimental design worksheet

Observation and analysis
Assessment: Students complete data records and graphs about the bacteria colonies they observe and analyze.

Students use microscopes to understand structure of bacteria.
Assessment: Bacteria lab worksheet

Knowledge/Skills linked to Power Standard = ✙

Unit: Cells

Duration: 2 Week(s)

Description

This unit explores cellular organelle structures/functions and cell processes such as photosynthesis, cellular respiration and protein synthesis.

MEHS Standard 2: Matter and Energy
MEHS Standard 7: Life Structures and processes

Essential Questions

What are the main cellular processes, how do they work and what are their structures?

Assessments

- Quizzes
- Cell Model Presentation
- Practice exam
- Unit exam

Resources

Biology (Holt McDougal) By: Dr. Stephen Nowicki
Cellular Organelle ppt

Vocabulary

- Cell wall
- Cell membrane
- Vacuole
- Leucoplast
- Chloroplast, ATP, glucose, Calvin Cycle, Stroma, Granna, Photosynthesis, photon
- Mitochondria, Krebs Cycle, Pyruvate molecule, cell respiration
- Nucleus
- Nucleolus, DNA, RNA, mRNA, tRNA, Transcription,
- Ribosome, protein synthesis,
- Lysosome
- Endoplasmic reticulum, chemosynthesis
- Golgi body.

Topic: Organelle Introduction Jigsaw

Duration: 2 Day(s)

Description

Students will break up into learning groups and count of by 6. All common numbers from other learning groups will form new expert groups.

The expert groups will become experts on two of the organelles. Experts will disband and return to learning groups to share new information about organelles.

Knowledge/Skills linked to Power Standard =

Topic: 4x6 Cell Organelle Cards (12) **Duration:** 2 Day(s)

Description

Each student will get 13 cards and colored pencils. They will make them into 12 study cards.
We will work our way through the text and a ppt to identify and learn the functions of the 12 main organelles.
On one side of the card will be a drawing to identify what the organelle looks like in the cell.
On the other side will be a written description of what the organelle's job is in the cell.
The organelles are: Cell wall, Cell Membrane, Lysosome, Leucoplast, Vacuole, Nucleus, Nucleolus, Golgi Body, Endoplasmic Reticulum, Ribosomes, Mitochondria, Chloroplasts.

The power point presentation that accompanies this is called, Cellular Organelles for students_new.ppt, and can be found at the following link:

https://drive.google.com/folderview?
id=0B6_wvnghrjeRfmFZVklXaU1Zb2hOa2xtX2dzNlVvU004R01oNTJvS19jSzJneTE1dmR1bkk&usp=sharing

Knowledge/Skills linked to Power Standard =

Topic: Build a cell representation **Duration:** 1 Week(s)

Description

Students build a model of a cell that includes all 12 organelles. They work outside of class with their partner for a week and then present their model to the class. During the presentations, students are required to present 6 of the organelles and their partner does the other 6. This helps students become experts on 6 of the organelles so they can focus on the other 6 for their test, since they need to know all 12 for the Unit Exam. They can create the cell model in many forms and the project descriptions are outlined in the cell model building.doc which can be found by following this link:

https://drive.google.com/folderview?
id=0B6_wvnghrjeRfmFZVklXaU1Zb2hOa2xtX2dzNlVvU004R01oNTJvS19jSzJneTE1dmR1bkk&usp=sharing

Knowledge/Skills linked to Power Standard =

Topic: Explain and demonstrate cellular processes **Duration:** 1 Week(s)

Description

Students will explain and demonstrate: photosynthesis, cellular respiration, and protein synthesis. This is done through a series of scaffolded activities. First students each have a blank piece of paper for each cellular process. The teacher draws out a diagram of the cellular process while writing the steps out at the same time. Students do their own drawing on their blank piece of paper and write down the steps. They then use the drawing and steps to write a complete paragraph describing the cellular process. They do this for all three of the cellular processes. Each one takes a class period. There are some online videos that describe transcription/translation (protein synthesis) well so those are also used to help in that explanation. Which lengthens that cellular process to 2 class periods.

Knowledge/Skills

paragraph writing
Description: Students write paragraphs explaining the three cellular processes.
Assessment: cell process quiz

Knowledge/Skills linked to Power Standard =

Topic: Protein Synthesis **Duration:** 3 Day(s)

Description

An error has occurred while processing HtmlTextBox 'HtmlTextBox14':
The 'html' start tag on line 1 position 2 does not match the end tag of 'blockquote'. Line 1, position 335.

Knowledge/Skills linked to Power Standard =

Topic: Cellular processes and organelles exam **Duration:** 2 Day(s)

Description

Students will be given one day to prepare for the exam, and one day to take the cellular exam.

The jeopardy game used to help students study is called, Cell Jeopardy Review_new.ppt, and the exam is called, Cell Exam.doc and both can be found at the following link:

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https://drive.google.com/folderview?id=0B6_wvnghrjeRfmFZVklXaU1Zb2hOa2xtX2dzNlVvU004R01oNTJvS19jSzJneTE1dmR1bkk&usp=sharing

Knowledge/Skills

Explain cellular processes.

Knowledge/Skills linked to Power Standard = ✣

Unit: Genetics

Duration: 4 Week(s)

Description

This unit explore concepts related to genetics including, heredity, probability, protein synthesis, genetic disorders, as well as mitosis and meiosis.

MEHS Standard 8: Genetics

Essential Questions

How do parents pass their genes onto their children? How do cells make proteins from genes?

Assessments

- Quizzes
- Research Paper
- Daily worksheets
- Summative test
- Text Reading
- QAR assignments

Resources

- · Genetics Basics and Beyond online tutorial and guide
- · Protein Synthesis PowerPoint
- · Mitosis PowerPoint
- · YouTube Videos:

o Transcription: http://www.youtube.com/watch?v=5MfSYnItYvg&feature=relmfu

o Translation: http://www.youtube.com/watch?v=8dsTvBaUMvw

o Mitosis: http://www.youtube.com/watch?v=VGV3fv-uZYI

- · Handouts/Worksheets: Protein Synthesis, College Words, Reebops and Reebop Babies, Probability games
- · Disease Paper Rubric
- · *The Stuff of Life* comic book for Daily 10 readings

Vocabulary

DNA-

ATCG-

RNA-

Sperm-

Egg-

Chromosomes-

Nuclear DNA-

Sperm tail mitochondrial DNA-

Germ Cell-

Somatic Cell-

X Chromosome-

Y Chromosome-

Dominant-

Recessive-

--Autosomal-

X-linked-

Traits-

Pedigree-

Subsequent Generation-

Genes-

46 Chromosomes-

Carriers--

Human Genome Project-

Zygote-

Allele-

Phenotype-

Genotype-

Mutation-

Substitution Mutation-

Deletion Mutation-

Duplication Mutation-

Insertion Mutation-

Probability-

Wild Type-

Mutant Type-

Segregation-

Meiosis-

Mitosis-

Haploid-

Diploid-

Homozygous-

Heterozygous-

Punnett Square-

Gene Pool-

Genetic Diversity-

Incomplete Dominate-

Topic: Daily 10- The Stuff of Life comic book **Duration:** 4 Week(s)

Description

Students will spend the first 10 minutes of each class reading from The Stuff of Life comic book. We will read one chapter per week, and answer QAR questions at the end of each week.

Knowledge/Skills

Gaining new information from informational text

Description: Students will be introduced to historical scientific figures through the text: The Stuff of Life

Assessment: Students answer QARs about readings.

Knowledge/Skills linked to Power Standard =

Topic: Vocab Match Up **Duration:** 1 Day(s)

Description

Student match vocab cards with definition cards, and then copy the definitions onto a worksheet.

The vocabulary list is called, Genetics Vocabulary and Genetics Vocabulary Key, and both can be found at: https://drive.google.com/folderview?id=0B6_wvnghrjeRfmhFRE5raVBRbEJoN0hrdExweEVkTGh1U1J6dE5IQ0dSSGQ3RE1BWlgtMDA&usp=sharing

Knowledge/Skills linked to Power Standard =

Topic: Mitosis Vocabulary List **Duration:** Ongoing

Description

Cell Division (Mitosis)Ch.5

1. Cell Cycle: Normal growth, DNA duplication and cell division of Eukaryotic cells.
2. Mitosis: The division of the cell nucleus and its contents.
3. Cytokinesis: The process of dividing the cells cytoplasm.
4. Chromosome: A long continuous thread of DNA, containing numerous genes.
5. Histones: Group of proteins associated with chromosomes.
6. Chromatin: A loose combination of DNA & proteins.
7. Chromatids: Half of a duplicated chromosome.
8. Centromere: A region of the condensed chromosome that looks pinched.
9. Telomere: The ends of DNA molecules.
10. Prophase: 1st phase of Mitosis; DNA condenses into tight chromosomes, nuclear envelope dissolves, Centrioles move to opposite poles, spindle fibers form.
11. Metaphase: 2nd phase of Mitosis; spindle fibers align the chromosomes along the cell equator.
12. Anaphase: 3rd phase of Mitosis; Chromatids separate, and are pulled to opposite sides of the cell.
13. Telophase: 4th phase of Mitosis; Nuclear membrane begins to form, chromosomes uncoil, spindle fibers fall apart.
14. Interphase: 5th phase of Mitosis; DNA copies itself and grows preparing for division.
15. Haploid: Half the chromosomes of a somatic cell.
16. Somatic cell: Cell that makes up all the body tissues except germ cells.
17. Germ cells: Egg cell or sperm cell.
18. Diploid: The chromosomes of a normal somatic cell.
19. DNA: Deoxyribonucleic Acid, chemical that makes up chromosomes.

Knowledge/Skills linked to Power Standard =

Topic: Meiosis Vocabulary List **Duration:** Ongoing

Description

Meiosis Vocabulary List Ch.6

1. Gametes: are sex cells made by meiosis. (1n)
2. Homologous Chromosomes: Two chromosomes one inherited from each parent.
3. Autosomes: Chromosome pairs that are not related to the sex of the organism.
4. Sex Chromosomes: Chromosomes that controls the sex characteristics developed by an organism.
5. Sexual Reproduction: The fusion of gametes, resulting in offspring that have characteristics of both parents.
6. Fertilization: Fusion of egg and sperm
7. Meiosis: the process of forming gametes
8. Gametogenesis: Production of gametes

9. Sperm: male gamete
10. egg: female gamete
11. Polar Bodies: Cells with little more than DNA that are eventually broken down.
12. Sister Chromatids: Chromosomes the are divided during Meiosis II.

Words you already know from Mitosis: Somatic Cells, Haploid, Diploid,

Knowledge/Skills linked to Power Standard =

Topic: Mitosis Lab **Duration:** 2 Day(s)

Description

Students learn about mitosis as well as meiosis. Students are introduced to the two processes initially through a lecture where they care compared to each other. Then they do a microscope lab and matching activity. The documents are called, Mitosis Microscope Project.doc and Mitosis Matching Activity.doc, and can be found at:

https://drive.google.com/folderview?id=0B6_wvnghrjeRfmhFRE5raVBRbEJoN0hrdExweEVkTGh1U1J6dE5IQ0dSSGQ3RE1BWlgtMDA&usp=sharing

Knowledge/Skills linked to Power Standard =

Topic: Genetics Basics and Beyone Online Tutorial **Duration:** 1 Day(s)

Description

o As a group, students have a tutorial guide. Students gather at the front of the room in order to see the tutorial and read the writing.

o While going through the tutorial, students are able to ask questions and expand upon concepts being taught

OR the students can do the tutorial individually in the computer lab or using the computer cart. The document is called, Genetics Tutorial The Basics and Beyond, and can be found at:
https://drive.google.com/folderview?id=0B6_wvnghrjeRfmhFRE5raVBRbEJoN0hrdExweEVkTGh1U1J6dE5IQ0dSSGQ3RE1BWlgtMDA&usp=sharing

Knowledge/Skills linked to Power Standard =

Topic: Mendel & Genetics **Duration:** Ongoing

Description

Genetics & Mendel Vocabulary List Chapter 6:
1. Trait: Distinguishing characteristics that are inherited.
2. Genetics: Study of biological inheritance patterns
3. Purebred: The offspring inherits all the characteristics of Similar parents.
4. Cross: Interbreeding of parents with different characteristics.
5. Law of Segregation: organisms inherit 1 copy of genes from each parent.
6. Gene: Piece of DNA that give instructions to a cell to make a certain protein.
7. Allele: Any alternate form of a gene.
8. Homozygous: Matching alleles for a characteristic.
9. Heterozygous: Different Alleles for a characteristic.
10. Genome: All of an organisms genetic material.
11. Genotype: Genetic material of a specific set of genes.
12. Phenotype: The physical characteristics or traits
13. Dominant: The characteristic that becomes a physical trait.
14. Recessive: The trait that is hidden in the presence of a dominant trait.
15. Punnett Square: A grid system for predicting all possible genotypes resulting from a cross.
16. Law of independent assortment: Allele pairs separate during Meiosis.

Knowledge/Skills linked to Power Standard =

Topic: Genetic Disease Research Paper **Duration:** 1 Week(s)

Description

Students will work with a partner to create a 5 paragraph APA style research essay about an assigned genetic disorder

Knowledge/Skills linked to Power Standard =

Topic: Heredity, punnet squares, and Probablility **Duration:** 3 Day(s)

Description

Students learn the concepts of heredity, punnet squares, and probability.
There is a series of activities that help student grasp these concepts. They are as follows and can be found at the link below:
Genetics Probability Games.doc

Changing Gene Pool Frequencies.doc
Darwin Turns 200_DRG.doc
Rebops.doc
Rebop babies.doc

https://drive.google.com/folderview?id=0B6_wvnghrjeRfmhFRE5raVBRbEJoN0hrdExweEVkTGh1U1J6dE5IQ0dSSGQ3RE1BWlgtMDA&usp=sharing

Knowledge/Skills

Active listening during classroom lecture
Assessment: Worksheets

Knowledge/Skills linked to Power Standard =

Topic: Natural Selection **Duration:** 2 Day(s)

Description

Students will read the article: Evolution: Some Explanations, and answer the questions in the directed reading guide, as well as view a PPt on evolution

Knowledge/Skills

Directed reading
Assessment: Students answer the questions from the directed reading guide.

Knowledge/Skills linked to Power Standard =

Topic: Theory of Evolution **Duration:** 2 Day(s)

Description

Reading activity Darwin Turns 200, Science News article. Students close read for questions (?) words or concepts they don't understand. Then the do a table chat about what they highlighted, trying to resolve their questions. Then the questions that can't be resolved as a group - class discussion. Then they do a directed reading guide with focused questions. The article and DRG are titled Darwin Turns 200 DRG.doc and Darwin Turns 200 Articles.pdf and can be found:

https://drive.google.com/drive/folders/0B6_wvnghrjeRfmhFRE5raVBRbEJoN0hrdExweEVkTGh1U1J6dE5IQ0dSSGQ3RE1BWlgtMDA?usp=sharing

TED Radio Hour has a radio story called 'How it all began' about human origins. Students follow along with a Herring Bone note taking guide and summarize at the end of the story. The Herring Bone WKS is called origins_tedradiohour.doc and can be found:

https://drive.google.com/drive/folders/0B6_wvnghrjeRfmhFRE5raVBRbEJoN0hrdExweEVkTGh1U1J6dE5IQ0dSSGQ3RE1BWlgtMDA?usp=sharing

The online url for the radio story can be found:
http://www.npr.org/programs/ted-radio-hour/357837221/how-it-all-began

Knowledge/Skills linked to Power Standard =

Topic: Famous Tumors **Duration:** 1 Day(s)

Description

This is a radio lab story that uses a lot of the vocabulary students are learning in this Unit to describe mutation and growth of tumors. The student note taking guide that goes along with it is called, Famous Tumors and can be found at:

https://drive.google.com/folderview?id=0B6_wvnghrjeRfmhFRE5raVBRbEJoN0hrdExweEVkTGh1U1J6dE5IQ0dSSGQ3RE1BWlgtMDA&usp=sharing

Knowledge/Skills linked to Power Standard =

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

Description

Students are given one day to study for the exam, and one day to take the exam. The jeopardy game that helps students study together for the test is called Genetics Review Jeopardy.ppt, the study guide is called Genetics Practice Exam and the exam is called Genetics Exam and all of those documents can be found at:

https://drive.google.com/folderview?

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Knowledge/Skills linked to Power Standard = ✜

Unit: Anatomy and Dissections

Duration: 4 Week(s)

Description

Students explore anatomy and physiology of living systems through "student as teacher" lessons and animal dissections. Students are also introduced to taxonomic classification.

MEHS Standard 7: Life Structures and Processes

Essential Questions

In what way do the body systems and organs of organisms differ across species?
How does structure drive function?

Assessments

- Oral quizzes
- Dissection packets
- Group presenting
- QAR worksheets

Resources

- Crayfish PPt
- Frog Ppt
- Rat Ppt
- Human Anatomy Note Guide
- Crayfish dissection packet
- Frog dissection packet
- Rat dissection packet

Vocabulary

External nostril

Entrance to esophagus

Glottis

Maxillary Teeth

Internal nostril opening

Vomerine teeth

Webbing

Counter shading

Fat Body

Cloaca

Urinary duct/ Ureter

Gall Bladder

Coelom

Femur

Humerus

Skull

Urostyle

Cheliped

Rostrum

Compound eye

Thorax Region

Abdomen Region

Uropods

Telson

Antenna

Antennule

Swimmerets

Carapace

Maxilla

Mandible

Brain

Green Gland

Gills

Flexor muscles

Ventral nerve cord

Dorsal Surface

Teats

Digits

Ventral Surface

Anus

Thoracic Cavity

Lungs

Diaphragm

Right Atrium

Left Atrium

Right Ventricle

Left Ventricle

Liver

Pancreas

Small Intestine

Mesentery

Stomach

Large intestine

Rectum

Trachea

Vertebra

Spinal Nerve Cord

Ribs

Kidney

Bile Duct

Topic: Students and teachers Body Systems Assignment **Duration:** 2 Week(s)

Description

In groups of 4 or 5, students are assigned a specific human body system on which to research and develop a half hour lesson.

Student groups teach body system lessons while the rest of the class fills in a body systems note taking guide.

Knowledge/Skills

Student will be able to design a lesson based on an assigned body system.
Assessment: Students will teach a 30 minute lesson based on their assigned body system.

diagramming and labeling information
Description: Students will diagram, label, and trace the pathway specific organ systems
Assessment: correctly labeled diagrams

Note taking in a study guide
Description: Students complete a study guide during teacher/ student lead lecture.
Assessment: Completed study guide

Student will research body systems and their organs.
Assessment: One on one checks for progress on "Students as Teachers" lesson.

Students will analyze structure to define function
Assessment: Students will answer questions about how structure drives function.

Knowledge/Skills linked to Power Standard = ✙

Topic: Animal Dissections **Duration:** 2 Week(s)

Description

Students explore the structure function relationship by dissecting crayfish, frogs, and rats.
Each dissection is increasingly challenging as more body systems are added to the dissection exams.
Crayfish dissection exam was 10 parts.
Frog dissection is a 20 pin test.
Rat dissection is a 25 pin test. The rat dissection is counted as the final exam for the semester and counts as a 100 pts test.

Knowledge/Skills

diagramming and labeling information
Description: Students will diagram, and label each dissected organisms.
Assessment: correctly labeled diagrams

Animal dissections
Description: Students dissect a: crayfish, frog, and rat.
Assessment: One on one teacher check

Memorizing structures and functions
Description: Students will memorize anatomical structures of each organism.
Assessment: Oral quizes

Knowledge/Skills linked to Power Standard = ✙

Topic: Taxonomic Classification **Duration:** 1 Week(s)

Description

Students read articles about taxonomic classification and complete Question Answer Relationship (QAR) worksheets. This will take place the first 10 minutes of class for one week.

Knowledge/Skills

Students read articles and answer QAR questions.
Assessment: QAR

Knowledge/Skills linked to Power Standard = ✙

Topic: Anatomy and Dissection Exam **Duration:** 2 Day(s)

Description

Students will take a unit exam to assess their growth during the anatomy and dissection unit. A study guide will have been provided at the beginning of the semester to aid in preparation. A study day will be given the day before the test to allow students to prepare for the test.

Knowledge/Skills

A selection of exam questions will address each of these standards.

Knowledge/Skills linked to Power Standard = ✙

Unit: Ecology **Duration:** 3 Week(s)

Description

Students will explore the subject of ecology through the following topics: natural selection, speciation, simbiosis, food webs, taxonomy, nitrogen cycle, carbon cycle, climate change, biomes.

MEHS Standard 6: Ecosystems: Cycles of Nature and Human Impacts

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Essential Questions

In what way to human actions affect the world in which we live?

Assessments

Natural selection directed reading guide.
Food web activity
Taxonomy, food webs, symbiosis quiz
Biomes summary chart
Culminating ecology poster

Resources

Natural selection directed reading
Kingdoms PPt
Symbiosis match-up activity
Nitrogen cycle game
Carbon cycle game
documentary: The 11th Hour
Biomes jigsaw activity
The Dark Side of Nitrogen directed reading

Vocabulary

natural selection, speciation, symbiosis, food webs, taxonomy, nitrogen cycle, carbon cycle, climate change, biomes, niche

Topic: Food Webs **Duration:** 2 Day(s)

Description

Students learn about food webs and create food web models.

Knowledge/Skills

Design food webs
Assessment: Food web posters.
Answer questions about food webs.

Knowledge/Skills linked to Power Standard = ✙

Topic: Nitrogen and Carbon cycles **Duration:** 2 Day(s)

Description

Students play games that demonstrate the flow of nitrogen and carbon through the environment. Student discuss how human impact affects these elements and how these changes affect climate

Knowledge/Skills

Understand the carbon and nitrogen cycles
Assessment: Carbon cycle game and nitrogen cycle game follow-up questions

Knowledge/Skills linked to Power Standard = ✙

Topic: Biomes jigsaw **Duration:** 2 Day(s)

Description

Students use jigsaw learning to understand the different biomes.

Knowledge/Skills linked to Power Standard = ✙

Topic: Ecosystems **Duration:** 7 Day(s)

Description

Students gain and understanding of ecosystems

Knowledge/Skills

Note taking
Assessment: Completed notes to accompany PPt

Apply knowledge to poster
Assessment: completed ecosystem poster

Knowledge/Skills linked to Power Standard = ✙

Integrated Science II

Science
NCAA Approved

Grade(s) 9th - 12th, Duration 1 Semester, 1 Credit
Required Course

Unit: Cumulative Final Review and Exam

Duration: 4 Day(s)

Description

We will spend about 3 days of review in preparation of the final exam. This unit does not include a review of the Human Reproductive systems or Animal Dissections.

Topic: Review Sheet

Duration: 3 Day(s)

Description

This is the attachment that is the Review sheet.

Knowledge/Skills linked to Power Standard = ✣