

El Monte Union High School District

Course Outline

High School _____ District _____

Title: <u>SUP Biology</u> Transitional* _____ (Eng. Dept. Only) Sheltered (SDAIE)* _____ Bilingual* _____ AP** _____ Honors** _____ Department: <u>Special Education</u> Grade Level (s): <u>9-12</u> Semester _____ Year <u>X</u> Year of State Framework Adoption _____	This course meets graduation requirements: () English () Fine Arts () Foreign Language () Health & Safety () Math () Physical Education (X) Science () Social Science () Elective	<table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">Department/Cluster Approval</th> <th style="text-align: left;">Date</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Department/Cluster Approval	Date	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
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*Instructional materials appropriate for English Language Learners are required.

**For AP/Honors course attach a page describing how this course is above and beyond a regular course. Also, explain why this course is the equivalent of a college level class.

1. Prerequisite(s): Student should be in the 9th, 10th, 11th, or 12th grade with a current Individual Educational Plan (IEP, which will identify their need to be enrolled in a Special Education Science course.

2. Short description of course which may also be used in the registration manual: The support class is designed to provide students with an individualized program of study in alignment with the student’s IEP, core curriculum and state standards. This support class introduces the student to practical topics in Biology. Demonstrations, experiments and hands-on activities are also incorporated into the program.

3. Describe how this course integrates the schools ESLRs (Expected School-wide Learning Results): (site ESLRS may replace the following)

The following ESLRS will be integrated:

Be effective communicators:

Students will:

- Use word processing and presentation programs to present their work.
- Use computers for research and development of projects.
- Receive supervised Internet instruction and utilize the net as a tool to assist them in their class work.

Be ethical and responsible individuals:

Students will:

- Be expected to be in class on time and prepared to work.
- Be expected to complete assignments on time and submit quality work.
- Be expected to assume personal responsibility for their work.

Be critical thinkers and self-directed learners:

Students will:

- Understand the process of goal setting and develop a personal plan for high school and beyond.
- Conduct lab investigations that present problems to solve and use critical thinking skills.

Be critical thinkers and self-directed learners:

Students will:

- Learn and follow all laboratory safety rules and procedures.
- Learn how to apply scientific concepts to improve their health.
-

Be healthy individuals:

Students will:

- Learn and follow all laboratory safety rules and procedures.
- Learn how to apply scientific concepts to improve their health.
- Apply topics in physiology and ecology to their lives in order to make healthy lifelong choices.

Be active community participants:

Students will:

- Be encouraged to respect diverse cultures within the classroom setting.
- Be given opportunities to participate in school clubs and activities that respect cultural diversity.
- Learn to work cooperatively with each other in groups when doing labs and projects.
- Develop working relationships across gender and cultural groups.

4. Describe the additional efforts/teaching techniques/methodology to be used to meet the needs of English Language Learners:

SDAIE (Specially Designed Academic Instruction in English) strategies will be incorporated into lessons

Vocabulary development will be emphasized

ELL supplementary materials will be incorporated into the lessons

Glossaries will be used as available

Visual/manipulative will be used

5. Describe the interdepartmental articulation process for this course:

When applicable, the science department is willing to work with other departments to coordinate student work

on course projects.

6. Describe how this course will integrate academic and vocational concepts, possibly through connecting activities. Describe how this course will address work-based learning/school to career concepts:

Students will be exploring career pathways and employment requirements within the Biology sciences.

7. Materials of Instruction (Note: Materials of instruction for English Language Learners are required and should be listed below.)

A. Textbook(s) and Core Reading(s):

B. Supplemental Materials and Resources:

C. Tools, Equipment, Technology, Manipulatives, Audio-Visual:

Visual presentations will be made using overhead transparencies, videos, models, and/or presentations with LCD projector. **A variety of standard glassware and laboratory equipment** . Standard computer technology including- , web browsers, and other software will be used as necessary.

8.

- **Objectives of Course**
- **Unit detail including projects and activities including duration of units (pacing plan)**
- **Indicate references to state framework(s)/standards (If state standard is not applicable then national standard should be used)**
- **Student performance standards**
- **Evaluation/assessment/rubrics**
- **Include minimal attainment for student to pass course**

1st Grading Period

Cell Biology

Standards I&E, 1a-c, e, h, 10d

Academic Vocabulary

1. Cell Theory
2. Semi permeable membrane
3. Cellular Catalyst
4. Enzyme
5. Golgi Apparatus
6. Prokaryote cells
7. Eukaryote cells
8. Ribosome
9. Substrate ER
10. Polysaccharide
11. Protein
12. Lipid
13. Nucleic acids
14. Photosynthesis
15. Chloroplast
16. Mitochondria
17. Chromosome
18. Diffusion
19. Chlorophyll
20. Macromolecule
21. Osmosis
22. Amino acids
23. Cytoplasm

Verbs to get there

1. Construct
2. Compare
3. Identify
4. Explain
5. Classify
6. Categorize

Expected Learning/Results for

Standards

1c, e; 10d

Cell Biology (Students will be able to...)

- a.) Create a chart that represents the structure of a plant, animal, bacteria and virus.
- b.) Use a table to compare and contrast structures and functions of organelles

1e

Identify the organelles that packages and distributes materials out of a eukaryotic cell.

1a

- Demonstrate the structure and function of cell membrane.

1h

- Differentiate between the three nutritional macromolecules and their subunits.

1b

- Examine and enzyme as a biological catalyst
- Demonstrate how the environmental factors affect the rate of reaction.

1/E, 1a

- Effectively use a compound microscope.

2ND Grading Period

Photosynthesis, Cellular respiration & Cell Division

Standards 1f, g, 2b

Academic Vocabulary

1. Cellular Respiration
2. Photosynthesis
3. Calvin Cycle
4. Krebs Cycle
5. Fermentation
6. Aerobic
7. Anaerobic
8. Grana
9. Thylakoids
10. Mitosis
11. Meiosis
12. Glycolysis
13. Light dependent cycle
14. Crossing Over
15. Diploid
16. Haploid
17. Electron
18. Glucose
19. Somatic cell
20. Gamete

Verb to get there

1. Summarize
2. Identify
3. Explain
4. Differentiate
5. Compare
6. Contrast
7. Illustrate

Expected Learning/Results for

Standards	Learning Objectives (The student will be able to...)
1f	<ul style="list-style-type: none">• Refer to the photosynthesis equation to summarize the processes involved in the chloroplasts.• Differentiate between the reactants required and products created for the light dependent and light independent reactions of photosynthesis.
1g	<ul style="list-style-type: none">• Refer to the cellular respiration equation to summarize the processes involved in the mitochondria.• Explain how the Krebs cycle is the main source of carbon dioxide.
2a	<ul style="list-style-type: none">• Explain how the process of meiosis separates and segregates chromosomes randomly resulting in genetic variation
2b	<ul style="list-style-type: none">• Compare and contrast the stages of meiosis and mitosis• compare and contrast the somatic cells and gametes resulting from

the process of mitosis and meiosis

3RD Grading Period

Genetics

Standards 2a-g, 3a-c, 4a-e, 5a-c

Academic Vocabulary

Phenotype	Genotype
Allele	Gene
Heredity	Mutation
Dominant	Recessive
Genetics	Chromosomes
Heterozygous	Homozygous
F1 Generation	Fertilization
Haploid	Diploid
Sex Chromosome	Autosomes
Independent Assortment	Law of Segregation
Zygote	Mitosis
Meiosis	Amino Acids
Base Paring Rules	Semi Conservative Replication
mRNA, tRNA, rRNA	Protein Synthesis
Protein Synthesis	Transcriptions
Translation	

Verbs to get there

1. Identify
2. Apply
3. Outline
4. Recognize
5. Draw
6. Create
7. Describe
8. Explain
9. Predict
10. Differentiate
11. Distinguish
12. Demonstrate

Expected Learning/Results for

Standards Molecular Genetics (The students will be able to...)

- | | |
|------------|--|
| 5a, 1d, 1h | <ul style="list-style-type: none">• Identify that DNA is like a set of instructions for production of proteins• Compare and contrast the general structures and functions of DNA, RNA, and Proteins |
| 4b,5b,1b | <ul style="list-style-type: none">• Apply the base pairing rules to explain precise copying of DNA during semi-conservative replication and mRNA formulation (transcripts) |
| 4a | <ul style="list-style-type: none">• Outline the general pathway b which ribosome's (rRNA) synthesize proteins, using tRNA's to translate genetic information carried by mRNA |
| 4b, 1d | <ul style="list-style-type: none">• Apply the genetic code rules to predict the sequence of amino acids from a sequence of codons in RNA (translation). |

4e

- Recognize the types, sequences and numbers of amino acids used to determine the type of protein produced.

4d

- Explain that all cells have the same DNA, but depending on the location of the cell, only a certain part of the DNA molecule will be used for that cell protein.

Standards

Mendelian Genetics (Students will be able to...)

2a

- Compare and contrast the divisional process that occurs in sex cells and somatic cells. Differentiate the number of chromosomes in each (meiosis vs. mitosis). Define chromosomes, genes, alleles, and traits.

2b, 2e

- Demonstrate how the pairs of chromosomes separate and segregate randomly during meiosis to produce gametes containing one chromosome from each pair. Recognize that sperm and ovum cells contain haploid numbers of chromosomes.

2d

- Predict how combinations of alleles may be generated in a zygote through the fusion of male and female gametes (fertilization) through the use of a Punnett Square.

2c, 3b

- Outline the genetic basis for Mendel's laws of segregation and independent assortment.

2f

- Distinguish the gametes that contain the XY chromosome (sperm) and the XX chromosome (ovum). Deduce that this is the factor responsible for sex determination.

2g, 3a

- Predict possible genotypes and phenotypes from a Punnett square and mode of inheritance (dominant, recessive, autosomal, x-linked).

5c

- Give examples of how man applies genetic engineering (biotechnology) to produce biomedical and agricultural products

4th Grading Period

Evolution & Ecology

Standards 6a-f, 7a-d, 8a-e

Academic Vocabulary

Geographic isolation
 Natural selection
 Heterozygous
 Genetic variation
 Genetic drift
 Population
 Biodiversity
 Ecosystem
 Water cycle
 Food web
 Producers
 speciation

Reproductive isolation
 Species
 Homozygous
 Community
 Diversity
 Fossil
 Succession
 Carbon cycle
 Nitrogen cycle
 Energy pyramid
 Decomposers

Verbs to get there:

Describe
 Illustrate
 Explain
 Analyze
 Summarize

Expected Learning/Results for

Standards

Evolution: (The student will be able to...)

- 8d
 - Describe the factors that lead to speciation within a changing environment (geographic and reproductive isolation).
- 8a
 - Describe the effects of natural selection on the phenotype of a species
- 7a, b, c
 - Explain that mutations can be maintained in the gene pool by heterozygous organisms, providing genetic variation in a gene pool.
- 7d
 - Describe how environmental changes determine the success of an organism within a species and throughout a community.
- 8c
 - Describe the effects of genetic drift on the diversity of organisms within a population.
- 8e
 - Analyze fossil evidence given a basic illustration and/or a geological time line.

Standards

Ecology: (The student will be able to...)

- 6a
 - Define biodiversity and give examples.
- 6b
 - Analyze ecological change (succession) by identifying the factors that cause them
- 6c
 - List the factors that cause change in population size within an ecosystem.
- 6d
 - Summarize the flow of matter through the following cycles: water, carbon, nitrogen.
- 6f
 - Describe the relationship between food webs and energy pyramids (emphasis on the roles of producers and decomposers).
- 6e
 - Illustrate the relationship between producers and decomposers.

5th Grading Period

Physiology

Standards 9,a-e &10,a-e

Academic Vocabulary

Hormone	Target cell
Endocrine gland	Homeostasis
Feedback inhibition	Specialized cell
Pathogen	Antibody
Immune System	Antigen
Vaccination	Pulmonary
System circulation	Plasma
Hemoglobin	Sensory Neuron
Respiratory System	Motor Neuron
Nonspecific Defense	Nervous System
Reflex Arc	Specific Defenses
Defenses	Circulatory System
Cerebellum	Cerebrum
White Blood Cells	Vision
HIV	Hearing
Vaccine	Axon
Taste	Dendrite
Smell	Synapse

Verbs to get there

Create
Describe
Differentiate
Explain
Identify
Outline
Illustrate

Expected Learning/Results for

Standards

Physiology

- | | |
|-----------|---|
| 9 | <ul style="list-style-type: none">• Create a flow chart which represents the levels of organization from molecule to organisms |
| 9a, b | <ul style="list-style-type: none">• Describe the general structure and function of:<ul style="list-style-type: none">a. The central nervous system vs. endocrine systemb. Circulatory vs. respiratory system |
| 9 c, d, e | <ul style="list-style-type: none">• Explain the interdependence of:<ul style="list-style-type: none">a. the central nervous and endocrine systemb. circulatory and respiratory system |
| 9 c, d, e | <ul style="list-style-type: none">• Differentiate between the major sensory organs. |
| 9 c, d, e | <ul style="list-style-type: none">• Describe the mechanism of a feedback loop using diagrams and flowcharts. |
| 9b | <ul style="list-style-type: none">• Using an illustration, identify the parts of a neuron and distinguish |

between the functions of each structure.

- 10
 - Differentiate between specific and non-specific immune response using examples
- 10 b
 - Outline the following processes:
 - a. phagocytosis by white blood cells
 - b. antibodies attack on pathogens
- 10 c
 - Describe the process and explain the purpose of vaccinations.
- 10e,I/E, 1d
 - Describe the consequences of a compromised immune system (AIDS).

6th Grading Period

Options:

Overflow/Re-teach

Lab Opportunities:

Biomes

Classification

Plants

Human Evolution

Animal Behavior

Marine Biology

Evaluation/assessment/rubrics including minimal attainment for student to pass course:

“A”-level work (90-100%): (Excellence overall; no major weaknesses).

This student demonstrates real achievement in grasping scientific thinking, along with development of specific geological thinking skills and abilities. This student’s work is clear, precise, and well reasoned.

“B”-level work (80-89%): (Moderate level of understanding and skill in geological thinking with some distinctive weaknesses; more strengths than weaknesses).

This student demonstrates a good level of achieving scientific thinking with occasional areas of weakness. This student’s work is essentially clear and precise with occasional lapses into weak reasoning.

“C”-level work (70-79%): (More than a minimum level of understanding and skill in geological thinking, but highly inconsistent with as many weaknesses as strengths).

This student demonstrates a mediocre level of achieving scientific thought with pronounced areas of weakness. This student’s work is inconsistent and shows only modest skills and reasoning.

“D”-level work (60-69%): (Minimal level of understanding and skill in biological thinking).

This student demonstrates a lack of clarity and discipline and appears to be only going through the motions. This student’s work does not show good scientific reasoning and skills and only rarely show any attempt to take charge of ideas.

“F”-level work (59% and below): (Far below minimal level of understanding and skill in geological thinking).

This student does not display any discernable scientific reasoning. This student failed to do the required work of the course, even at a level-approaching standard.

In this course, there will be standards-based 6, 12, 18 week exams to assess student achievement.