Perris Union High School District
Course of Study

A. COURSE INFORMATION

Course Title:
(limited to 34 characters with spaces in Infinite Campus)

Science 6

- ☐ New
- ☑ Revised

If revised, the previous course name if there was a change

Transcript Course Code/Number:

904063

(To be assigned by Educational Services if it's a new course)

CREDIT TYPE EARNED:	CALPADS CODE:
science	9320

Subject Area:

- ☐ Social Science
- ☐ English
- ☐ Mathematics
- ☑ Laboratory Science
- ☐ World Languages
- ☐ Visual or Performing Arts
- ☐ College Prep Elective
- ☐ Other

Is this classified as a Career Technical Education course?

- ☐ Yes
- ☑ No

If yes, which pathway does this course align to?
Pathway Name:

CTE CDE Code:

Grade Level(s)

- ☐ MS
- ☐ HS
- ☐ 5
- ☑ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10
- ☐ 11
- ☐ 12

Was this course *previously approved by UC* for PUHSD?

- ☐ Yes
- ☐ No

(Will be verified by Ed Services)

Which A-G Requirement does/will this course meet?

☐ Pending

Credential Required to teach this course:
To be completed by Human Resources only.

SS: Science: Biological Sciences; Science: Chemistry; Science: Geosciences; Science: Physics; Foundational-Level General Science

Signature

Date 2/28/2024

Submitted by: Julie Harris
Site: SSC
Date: 02/15/2024
Email: julie.harris@puhsd.org

Unit Value/Length of Course:

- ☐ 0.5 (half-year or semester equivalent)
- ☑ 1.0 (one-year equivalent)
- ☐ 2.0 (two-year equivalent)
- ☐ Other:

Approvals	Name/Signature	Date
Director of Curriculum & Instruction		
Asst. Superintendent of Educational Services	Kirsty Lee Madamel	3/7/24
Governing Board		

Prerequisite(s) (REQUIRED):

Corequisite(s) (REQUIRED):

Brief Course Description (REQUIRED):

Sixth-grade science is a standard and laboratory-based program. Focusing on exploring the introductory principles of Earth, Physical, and Life Sciences through an integrated approach. Science activities are based on the Next Generation Science Standards, which allow students to explore connections across the four domains of science. This employment of the various cross-cutting concepts helps students develop a coherent and scientifically-based view of the world around them while utilizing the skills and techniques outlined in the Investigation and Experimentation Strand of the Content Standards.

B. COURSE CONTENT

Course Purpose (REQUIRED):
What is the purpose of this course? Please provide a brief description of the goals and expected outcomes. Note: More specificity than a simple recitation of the State Standards is needed.

The purpose of this course is to expose students to research-based 5E instruction(Engage, Explore, Explain, Elaborate, and Evaluate) while utilizing phenomena designed to inspire and ask questions. Through this instruction criteria, students will be able to explain and analyze the various concepts within each unit.

Course Outline (REQUIRED):
Detailed description of topics covered. All historical knowledge is expected to be empirically based, give examples. Show examples of how the text is incorporated into the topics covered.

<u>Unit 1: Systems on Earth</u>
Concept 1.1 Body Systems-
Students will be able to develop and evaluate models of the endocrine system to make predictions of how changes in a subsystem can affect a larger system.

Assessment Criteria: Endocrine Eddie Project

Objectives- After this section students will be able to:

- Use arguments supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
- Cite specific textual evidence to support analysis of science and technical texts.

Concept 1.2 The Cell as a System-
Students will be able to provide evidence that living things are made of cells and explain the function of a cell as a whole and how a cell is a part of an interacting system within the body.

Assessment Criteria: Build a plant or animal cell model.

Objectives- After this section students will be able to:

- Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to its function.

Concept 1.3 Earth's Interacting Systems:
Students will be able to communicate how Earth's systems interact by transferring matter and energy.

Assessment Criteria: Lab write-up on diffusion within liquids. Lab write-up of egg floating model on salinity and density.

Objectives- After this section students will be able to:

- Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
- Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.

<u>Unit 2: Causes of Weather</u>
Concept 2.1 Energy Transfer in the Water Cycle:
Students will be able to explain the relationships between the temperature and total energy of a system depending on the types, states, and amount of matter present; and how energy is spontaneously transferred out of hotter regions or objects and into colder ones.

Assessment Criteria: Water Cycle Model/Drawing

Objectives- After this section students will be able to:

- Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
- Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.

- Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.

Concept 2.2 Weather Patterns:
Students will be able to explain how weather is influenced by interactions involving sunlight, the ocean, the atmosphere, and landforms.

Assessment Criteria: Cloud in a Bottle Lab, Weather Patterns in California (PBA).

Objective- After this section students will be able to:
- Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
- Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.
- Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.
- Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.

<u>Unit 3: Causes and Effects of Regional Climates</u>
Concept 3.1 Creating Climate Regions:
Students will be able to communicate how climate is influenced by the interactions of sunlight, oceans, the atmosphere, ice, landforms and living things.

Assessment Criteria: Socratic Seminar

Objectives- After this sections students will be able to:
- Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.
- Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
- Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.

Concept 3.2 Environmental and Genetic Influences:
Students will be able to identify genetic factors, as well as local conditions, that affect the growth of plants and animals.

Assessment Criteria: Socratic Circle - Inner/Outer Groups

Objectives- After this section students will be able to:

- Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

Concept 3.3 Reproductive Success:
Students will be able to identify how organisms reproduce, either sexually or asexually, and explain the transfer of their genetic information to their offspring.

Assessment Criteria: Build a Better Pollinator Project

Objectives- After this section students will be able to:
- Use arguments based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.
- Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.

Concept 3.4 Heredity:
Students will be able to explain sexual reproduction in organisms, and how each parent contributes half of the genes acquired, at random, by the offspring. Identify variations of inherited traits derived from genetic differences that result from the subset of chromosomes and genes that are passed down from parent to offspring.

Assessment Criteria: Making Monsters Lab

Objectives- After this section students will be to:
- Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.

<u>Unit 4: Our Changing Climate</u>

Concept 4.1 Causes of Climate Change:
Students will be able to identify and explain how climate change can be short-term or long-term, and provide evidence to support that climate change is being observed.

Assessment Criteria: Climate Change Model Written Explanation

Objectives: After this section students will be to:
- Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
- Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

Concept 4.2 Climate Change Impacts Organisms:
Students will be able to analyze the climate change impact on organisms based upon their habitats for food, shelter, water, and space.

Assessment Criteria: Migration Journey of the Monarch Butterfly Written Collaboration

Objectives: After this section students will be to:

- Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
- Use arguments based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.
- Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

Concept 4.3 Reducing Human Impact on the Environment:
Students will be able to demonstrate their understanding of human impacts on the environment.

Assessment Criteria: How do engineers reduce human impact on the environment? STEM activity

Objectives: After this section students will be to:

- Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
- Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
- Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Writing Assignments (REQUIRED):
Give examples of the writing assignments and the use of critical analysis within the writing assignments.

Unit 1 Projects:

- Endocrine Eddie Project: In this activity, students develop and evaluate models of the endocrine system to make predictions of how changes in a subsystem can affect a larger system.

- Build a Plant or Animal Cell Model: In this project, students develop a model of either a plant or animal cell and label the parts of the cell. Students present and explain how the parts of their cell

function together as a system.

- Diffusion Lab: In this lab, students will explain the process of diffusion and apply this process to the transfer of energy and matter in Earth's systems.

- Egg Float Lab: In this lab, students describe how the modeling of an egg floating in water simulates the transfer of energy and matter.

Unit 2 Projects:

- Water Cycle Model/Drawing: Students create a visual representation of the water cycle and identify where energy transfer occurs throughout the cycle.

- Cloud in a Bottle Lab: In this lab, students utilize the creation of a cloud in a bottle to simulate energy transfer within the water cycle.

- Weather Patterns in California (PBA): Students will use their observations, data, and evidence, to identify patterns and make connections between the geography of California and its unique climate and weather patterns.

Unit 3 Projects:

- Socratic Seminar: Students answer questions about patterns that determine regional climates, the distinctions between climate and weather, the characteristics of Earth's different climates and the effects of Earth's rotation on the oceans and atmosphere.

- Socratic Circle - Inner/Outer Groups:Students discuss organism adaptations influenced by environmental and genetic factors, types of adaptations, and factors that affect organism populations.

- Build a Better Pollinator Project: Students will design and build a model of a better pollinator and present their model to the class, by explaining what genetic features have been changed to improve its success at survival.

- Making Monsters Lab: Students develop a model that displays genetic variation in offspring and distinguish between dominant and recessive traits from the use of Punnett Square.

- Family Tree: Students analyze a model of a family tree and construct an explanation for the fact that siblings can inherit different traits from the same parents.

- Principles of Heredity: Students obtain and evaluate information from multiple sources about Mendel's contributions to our understanding of inheritance patterns and summarize what they have learned in written form.

- Explaining Trait Patterns: Students evaluate information in a scenario and construct an explanation for the observed pattern,defending their reasoning using text evidence and prior knowledge.

- Representing Alleles: Students obtain and synthesize information from text, and then explain the cause-effect relationship between genotypes and phenotypes.

- Genes That Influence More Than One Trait: Students gather information from text and use it to answer scientific questions about ways that a single gene can affect multiple traits.

- Breeding Pea Plants: Students use a model to analyze and interpret qualitative and quantitative patterns in the genotypes and phenotypes of offspring resulting from genetic crosses.

- Analyzing Hair Length and Analyzing Hair Color: Students will develop and use models to represent the cause-effect relationship between genotype and phenotype patterns in parents and their offspring. Students gather information from text and media about alleles, dominant and recessive genes, and the Punnett square to support or refute claims about a cause-effect relationship between traits and how they are inherited.

- Punnett Square: Students analyze a Punnett square model to determine the pattern of genotypes of the offspring. Genotypes and Phenotypes

Unit 4 Projects:

- Modeling the Sun's Energy on Earth- Students plan and conduct an investigation into the cause-effect relationship between the angle at which solar radiation strikes Earth's surface and climate.

- Heating of Earth and Climate Regions- Students gather, read, and synthesize information about the cause-effect relationship between solar radiation and regional climates, and communicate their understanding using a model of Earth.

- Solar Energy Distribution and Mixed Messages- Students construct an evidence-based explanation about the cause-effect relationship between Earth's shape and the climates of different regions.

- Traveling Rubber Ducks- Students will identify patterns in oceanic water movement by evaluating information from a rubber duck spill.

- Convection within Earth's Systems- Students obtain information from multiple sources, looking for patterns that will be useful in answering a scientific question about the relationship between wind, temperature, and climate.

- The Trade Winds- Students use a model to describe patterns of air temperature and movement on Earth.

- Hands-On Investigation: Density Currents-Students plan and conduct an investigation to produce data that will serve as evidence to explain the cause of density currents in the oceans.

- Explanation of Density Currents-Students obtain information from reading text and use that information to explain patterns of ocean water circulation on Earth.

- What Determines Climate?- Students use a model to investigate how patterns of ocean water circulation and latitude cause differences in regional climates.

- Climate Change Model Written Explanation, Migration Journey of the Monarch Butterfly Written Collaboration, and In the summative concept assessment, students answer questions about human impacts on the environment, methods for monitoring and reducing human impacts on the environment, human use of natural resources, and renewable vs. nonrenewable resources.

- Martian Biosphere-In this activity, students will obtain information about the challenges and results of Biosphere 2, then construct explanations about what Earth systems would need to be represented in a Martian habitat.

INSTRUCTIONAL MATERIALS (REQUIRED)	
Textbook #1	
Title: Discovery Education	Edition: Online
Author:	ISBN:
Publisher:	Publication Date:
Usage: ☑ Primary Text ☐ Read in entirety or near	
Textbook #2	
Title:	Edition:
Author:	ISBN:
Publisher:	Publication Date:
Usage: ☐ Primary Text ☐ Read in entirety or near	
Supplemental Instructional Materials *Please include online, and open source resources if any.*	

Estimated costs for classroom materials and supplies (REQUIRED). *Please describe in detail.* If more space is needed than what is provided, please attach a backup as applicable.	
Cost for a class set of textbooks: $	Description of Additional Costs:
Additional costs:$	
Total cost per class set of instructional materials:	$

Key Assignments (REQUIRED):

Please provide a detailed description of the Key Assignments including tests, and quizzes, which should incorporate not only short answers but essay questions also. How do assignments incorporate topics? Include all major assessments that students will be required to complete

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Instructional Methods and/or Strategies (REQUIRED):

Please list specific instructional methods that will be used.

- Oral In-Class Participation/Classwork/Homework
- Focus Activities
- Homework/Classwork
- Student Presentations
- Quizzes and Tests
- Writing Assessments
- Projects (including Artifact, Written and Oral Assessment)

Assessment Methods and/or Tools (REQUIRED):

Please list different methods of assessments that will be used.

- Vocabulary Assessments
- Grammar Assessments
- Lesson Assessments
- Unit/Chapter Assessments
- Individual Presentations
- Group Presentations
- Cumulative Semester Assessments

COURSE PACING GUIDE AND OBJECTIVES (REQUIRED)				
Day(s)	**Objective**	**Standard(s)**	**Chapter(s)**	**Reference**

C. HONORS COURSES ONLY
Indicate how much this honors course is different from the standard course.

D. BACKGROUND INFORMATION
Context for course (optional)
History of Course Development (optional)