



Course Title: Eighth-Grade Science

Instructors: Ms. Bercha

Instructors' Contact Info: lbercha@gomperscharter.org (classroom 51B)

Instructors' Availabilities: Office hours are by appointment only.

Course Description:

This year in Eighth-Grade Science, we will be covering the following concepts: the scientific method, astronomy, motion and force, kinetic and potential energies, the properties of waves, chemistry, metabolism, cellular reproduction, biodiversity, global climate change, the internet, as well as artificial intelligence. To help foster personal passions for self-education, students will receive engaging yet rigorous demonstrations, project-based assignments, as well as frequent rehearsal of academic skills and habits - i.e. reading, writing, public-speaking, organization, self-regulation, goal-setting, metacognitive, personal passion development, experimentative, and innovative.

GPA Grading Guidelines:

Category	Grading Criteria	Percentage
Classwork	<ul style="list-style-type: none">Completion/Quality (Must have a minimum of 1 weekly grade)	30%
Demonstrations of Learning	<ul style="list-style-type: none">Key Course Assignments (See course syllabus for Unit Key Assignments)	35%
Homework/Independent Learning	<ul style="list-style-type: none">Any work assigned to a student in which they complete on their own outside of class. (Must have a minimum of 1 weekly grade)	10%
Quarter Finals	<ul style="list-style-type: none">Quarter finals are course specific, standards based exams that cover content from the 9 week quarter.	25%

* Classwork/Participation and Homework/Independent Learning will be updated weekly.



Course Materials:

GPA Planner, science notebook, various handouts from NewsELA and the textbook, *Physical Science* (Holt, et al, 2007), various types of scientific lab equipment, classroom set of iPads, various iPad applications and online resources, Google Classroom, PowerSchool.

Course Structure:

This class will include lectures, project-based learning assignments, reflections, and lab activities. Throughout the year, the students will be able to utilize personal passions, practice using a growth mindset, and practice skill development through interactive activities.

Course of Study: *This is a tentative schedule that is subject to change.*

Scientific Method Unit (3 weeks, 14 lessons)

Content Standards	Learning Objectives	Key Assignments/Exams
<ul style="list-style-type: none">• GPA & Classroom Culture & Expectations• Scientific History, Method, Knowledge, & Innovation	<ul style="list-style-type: none">• See the Late Work Policy as well as the GPA Student Expectations above• Construct a scientific explanation based on evidence for how the historical development of science is connected to innovation and technology, the ever-growing body of scientific knowledge, as well as the scientific method.• Develop a theoretical model of the modern scientific method to describe how logical reasoning is connected to the cyclic pattern between the steps of purpose, research, hypothesis, experiment, analysis, and theory formation.• Ask questions to clarify evidence of the factors that enable science to be used for good and/or bad purposes and/or outcomes.	<ul style="list-style-type: none">• Vocabulary Flashcards• NewsELA Handout - "The Birth of Modern Science"• Theoretical Model of the concept of the Scientific Method• Science Timeline Presentation• Culture & Expectations Quiz• Science Basics Quiz• Quarter One Final



Astronomy Unit (5 weeks, 24 lessons)

Content Standards	Learning Objectives	Key Assignments/Exams
<ul style="list-style-type: none">ESS1A - The Universe & Its StarsESS1B - Earth & the Solar SystemESS1C - The History of Planet Earth	<ul style="list-style-type: none">Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.Analyze and interpret data to determine scale properties of objects in the solar system.Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.	<ul style="list-style-type: none">Vocabulary Flashcards<i>Cosmos</i> Worksheet - "Standing Up in the Milky Way"<i>Physical Science</i> Handouts - "Stars, Galaxies, & the Universe"NewsELA Handouts - "How Our Solar System Formed: A Close Look at the Planets Orbiting Our Sun," "What is an orbit?" & "Earth's Systems: Geologic Time"Models of the Solar System and the Galaxy<i>The Martian</i> Worksheet<i>The Mars Generation</i> WorksheetAstronomy QuizQuarter One Final

Forces & Motion Unit (3 weeks, 14 lessons)

Content Standards	Learning Objectives	Key Assignments/Exams
<ul style="list-style-type: none">PS2A - Forces and MotionPS2B - Types of InteractionsPS2C - Stability & Instability in	<ul style="list-style-type: none">Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.Plan an investigation to provide evidence that the change in an object's motion	<ul style="list-style-type: none">Vocabulary Flashcards<i>Cosmos</i> Worksheet - "When Knowledge Conquered Fear"<i>Physical Science</i> Handouts - "Matter in



Physical Systems	<p>depends on the sum of the forces on the object and the mass of the object.</p> <ul style="list-style-type: none">• Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.• Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.• Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.	<p>Motion" & "Forces & Motion"</p> <ul style="list-style-type: none">• Collision Reduction Project• Gravity & Magnetism Presentation• Forces & Motion Quiz• Quarter Two Final
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Energy Unit (2 weeks, 10 lessons)

Content Standards	Learning Objectives	Key Assignments/Exams
<ul style="list-style-type: none">• PS3A - Definitions of Energy• PS3B - Conservation of Energy & Energy Transfer• PS3C - Relationships between Energy & Forces	<ul style="list-style-type: none">• Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.• Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.• 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.	<ul style="list-style-type: none">• Vocabulary Flashcards• NewsELA Handouts - "Matter & Energy: What is Energy?" & "Everyday Mysteries: Why don't I fall out of an upside-down roller coaster?"• Models of Kinetic & Potential Energies• Thermal Energy Transfer Project• Energy Quiz• Quarter Two Final



	<ul style="list-style-type: none">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.	
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Waves Unit (3 weeks, 12 lessons)

Content Standards	Learning Objectives	Key Assignments/Exams
<ul style="list-style-type: none">PS4A - Wave PropertiesPS4B - Electromagnetic RadiationPS4C - Information Technologies and Instrumentation	<ul style="list-style-type: none">Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.	<ul style="list-style-type: none">Vocabulary Flashcards<i>Cosmos</i> Worksheet: "Hiding in the Light"NewsELA Handout - "Earth's Systems: What are Waves?" & "Issue Overview: The spectrum"Models of Light & Sound WavesDigitized vs Analog Signals PresentationWaves QuizQuarter Two Final

Chemistry Unit (5 weeks, 25 lessons)

Content Standards	Learning Objectives	Key Assignments/Exams
<ul style="list-style-type: none">PS1A - Structure & Properties of MatterPS1B - Chemical ReactionsPS1C - Nuclear Processes	<ul style="list-style-type: none">Develop models to describe the atomic composition of simple molecules and extended structures.Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.	<ul style="list-style-type: none">Vocabulary Flashcards<i>Cosmos</i> Worksheet: "Deeper, Deeper, Deeper Still"<i>Physical Science</i> Handouts - "States of Matter," "Introduction to the Atom," "Elements, Compounds, & Mixtures," as well as



	<ul style="list-style-type: none">• Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.• Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.• Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.	<p>"Chemical Bonding"</p> <ul style="list-style-type: none">• Models of States of Matter, Atoms, & Molecules• Chemistry Quiz• Quarter Three Final
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Metabolism & Cellular Reproduction Unit (4 weeks, 18 lessons)

Content Standards	Learning Objectives	Key Assignments/Exams
<ul style="list-style-type: none">• LS1A - Structure & Function• LS3A - Inheritance of Traits• LS3B - Variation of Traits	<ul style="list-style-type: none">• Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.• Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.• Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.• Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.• Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and	<ul style="list-style-type: none">• Vocabulary Flashcards• <i>Cosmos</i> Worksheet - "The Lost Worlds of Planet Earth"• NewsELA Handouts - "Immune Cells Work Overtime to Protect against Illness" & "Explainer: What is a gene?"• Models of Metabolism, Cellular Reproduction, & Genetic Mutations• Metabolism & Cellular Reproduction Quiz• Quarter Three Final



	sexual reproduction results in offspring with genetic variation.	
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Biodiversity Unit (3 weeks, 15 lessons)

Content Standards	Learning Objectives	Key Assignments/Exams
<ul style="list-style-type: none">• LS4A - Evidence of Common Ancestry• LS4B - Natural Selection• LS4C - Adaptation• LS4D - Biodiversity & Humans	<ul style="list-style-type: none">• Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.• Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.• Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.• Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.• Gather and synthesize information about technologies that have changed the way humans influence the inheritance of desired traits in organisms.• Use mathematical representations to support explanations of how natural selection may lead to increases and	<ul style="list-style-type: none">• Vocabulary Flashcards• <i>Cosmos</i> Worksheet: "Some of the Things That Molecules Do"• NewsELA Handouts - "The Chicken Family Tree Branches Out to Dinosaurs, so Say Scientists" & "Family Tree Grows: Surprising Details Emerge on Human-like Species"• Family Tree / Tree of Life Project• DNA Ancestry & Biodiversity Presentation• Biodiversity Quiz• Quarter Four Final



	decreases of specific traits in populations over time.	
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Scientific Innovation Unit (4 weeks, 16 lessons)

Content Standards	Learning Objectives	Key Assignments/Exams
<ul style="list-style-type: none">Scientific History, Method, Knowledge, & TechnologyInnovation & Technology: The Internet, Robotics, and Artificial Intelligence	<ul style="list-style-type: none">Develop a theoretical model of the concept of science to show the connections between the historical development of science, the ever-growing body of scientific knowledge, the modern scientific method, as well as innovation and technology.Construct a scientific explanation based on evidence for how science can be used for good and/or bad purposes and/or outcomes.Ask questions to clarify evidence of the factors that developed the internet into a global computer network that provides a variety of information, communication, and commerce.Ask questions to clarify evidence of the potential factors that are necessary for robots to possess artificial intelligence.	<ul style="list-style-type: none"><i>Cosmos</i> Worksheet - "Unafraid of the Dark"<i>Bicentennial Man</i> (PG-13)<i>Hitchhiker's Guide to the Galaxy</i> (PG)NewsELA Handouts - "Issue Overview: The Internet of things," "Dream Jobs: Robotician," & "Sophia, the Robot, Says Artificial Intelligence is 'Good for the World'"Theoretical Model of the concept of Science

Accommodations/Modification and Supports:

In conjunction with the accommodations and modifications described in the course description, if a student requires further accommodations, modifications, or additional supports, please notify their teacher so that we may arrange for the necessary accommodations, modifications and supports. As our mission as teachers is to help each and every one of our



students discover and/or rediscover their own passion for education, we can assure that we will do everything in our power to assist each student according to his or her specific needs and abilities so that he or she is adequately prepared for high school next year.

GPA Student Expectations:

- School-wide Attendance:

All students are expected to be punctual and in their classroom seat, ready to learn for each day. Under California law (Ed. Code 48200) all children between the ages of six and eighteen are required to be enrolled and in regular attendance at school. GPA families know that school attendance is the critical first step to make sure that each student receives an education that will help them on their path to college. Students cannot learn what they need to be prepared for the next grade level, if they are not in school. The more absences from school a student has, the more they fall behind in their classes and the more difficult it will be to make it to college.

- Planner Use:

All students are expected to write all assignments in their GPA planner daily. Your first GPA planner will be provided by the school to support organization and time management.

- MLA Format:

Students are required to follow the MLA format for all written and/or typed assignments. MLA formatting rules are as follows:

- ❖ Typed, double-spaced: TIMES NEW ROMAN, 12 font, including title.

- ❖ Heading: 4 lines - UPPER LEFT corner.

Student name: "Sammy Gompers"

Teacher name: Ms. Bercha

Course name, period: Science, Period 3

Date 06 February 2018

- ❖ All pages numbered: upper right corner, last name and page number; no punctuation, no "p." or "pg."

- ❖ Title: centered, upper and lower case.

- ❖ Work Cited/ Documentation Format: It is necessary to credit any source that is used in a paper or project. Plagiarism is considered cheating. All sources must be



documented. Citing sources in a paper must be thorough and accurate. MLA formatting for in-text citations and works cited is mandatory.

- Electronic Device Policy:

Cell phones, smart watches, and other electronic communication devices that can send and/or receive data are not permitted to be visible, heard, or used in any manner during school hours except by approval of school authorities. Any violation and/or disruption of the learning process will result in the confiscation of the item. The parent/guardian must pick up the confiscated item from the Office of Student Conduct or the teacher.

- Homework Completion:

As a school working toward college preparation, all GPA students are expected to complete their daily/weekly assignments. Students who fail to complete their homework assignments on time, and are unexcused, will be required to attend lunch and after school tutoring support daily until completed. Until all assignments are completed, students may not be eligible for athletics, clubs, and other extracurricular activities.

- Academic Integrity:

Honest behavior is an expectation for all students at Gompers Preparatory Academy. Our goal is to create and maintain an ethical academic atmosphere. Students found in violation of GPA's Academic Integrity Policy will be disciplined appropriately, which may lead to formal suspension. Consequences for offenses may include, but are not limited to, detention, *lowering of academic and citizenship grade and/or suspensions/exclusion from extracurricular activities*. Acts of academic dishonesty that will not be tolerated at GPA are listed below:

- ❖ Cheating on any classroom assignment, test, or quiz.
- ❖ Plagiarism - copying or representing another's ideas, words, or work as one's own, without properly citing the source. Plagiarism includes the misuse of published material, electronic material, and/or the work of other students. The original writer who intentionally shares his/her work for another to copy, without the permission of the teacher, is also engaged in plagiarism.
- ❖ Fabrication (any falsification or invention of date, citation, or other authority in an assignment); theft or alteration of materials.
- ❖ Unauthorized collaboration.



- ❖ Unauthorized use of electronic devices.

- Computer/Internet Usage Policy:

Students may not use computers and/or the GPA network without proper adult supervision. The teacher/staff will choose resources on the Internet that are appropriate for classroom instruction and/or research for the needs, maturity, and ability of their students. *Acceptable Use:*

- ❖ Access to any site that provides information relevant to current class assignments.
- ❖ Access to college or university websites.
- ❖ Use of teacher approved educational software (games, instructional tools, etc).

Late Work Policy:

Students are expected to complete ALL assignments to the best of their ability by the assigned due dates. Due date extensions will be granted upon reasonable requests prior to assignment due date. Within *one* school-day late, the highest score an assignment can receive is an F (50%). After five school-days late, the assignment will no longer be accepted. All homework assignments will be posted on Google Classroom and will be an extension of classwork. No new material will be sent home as homework.

Important Dates:

Quarter 1:

- Q1 Finals Week: October 23rd and 27th
- Parent Conferences: October 23rd - 27th
- End Date: October 30th

Quarter 2:

- Q2 Finals Week: January 22nd - 26th
- Parent Conferences: January 16th - 22nd
- End Date: January 31st

Quarter 3:

- Q3 Finals Week: April 9th - 13th
- Parent Conferences: April 16th - 20th
- End Date: April 23rd

Quarter 4:

- Q4 Finals Week: May 29th - June 1st



GOMPERS PREPARATORY ACADEMY *A UCSD Partnership*

1005 47th Street, San Diego, CA 92102 p. (619) 263-2171 f. (619) 264-4342 www.gompersprep.org

- End Date: June 26th

Student Signature : _____ Parent/Guardian Signature: _____

Date: _____

