

PCSD #1 Curriculum Map

Content Area: Science

Course Name: Integrated Science 9

**Honors Integrated Activities

Unit and Timeframe	Essential Questions/Content	Objectives and Learning Targets	Resources/Text	Projects/Activities	Assessment/ Proficiency Scales	Priority Performance Standards
Science as Inquiry: Engineering Design	Review of scientific discovery process, calculations/measurements, and presenting data. EQ: Generate a hypothesis to test an inference that you have observed. Summarize and analyze your findings.	Students will learn how to gather data. Students will learn how to report their findings in graph form, and what type of graph to use. Students will learn how to analyze data and communicate results.	CK12: Scientific Method	Senses Lab Gum Lab	Lab Rubric Informal Assessments: Bell work/exit slips/class lectures/discussions/check for understanding/guided reading answers/HW Formal Assessments: Scientific Method Test 80% of students will average a score of 80% on unit assessments.	ETS1-1: ETS1-2: ETS1-3: ETS1-4: ETS1-5:
Matter	The physical and chemical properties of different states of matter. EQ: Compare and contrast the properties of different states of matter. EQ: Provided examples in class, classify each as a state of matter and identify the criteria to be categorized as that state of matter.	Students will demonstrate knowledge of the states of matter with understanding the properties and identifying characteristics that are associated with each state of matter.	CK 12: Matter	Density Lab Physical Changes of Water Lab Chemical Changes Lab	Lab Rubric Informal Assessments: Bell work/exit slips/class lectures/discussions/check for understanding/guided reading answers/HW Formal Assessments: 80% of students will average a score of 80% on unit assessments.	PS1-5: Apply scientific principles and use evidence to provide an explanation about the effects of changing the temperature of the reacting particles on the rate at which a reaction occurs.
Atoms/Periodic Table	The study of atoms combines the study of	Students will demonstrate knowledge	CK 12: Atoms	PHET Lab: Build an Atom	Lab Rubric	PS1-1: Use the periodic table as a model to

	individual atoms and reasoning for elements organization in the periodic table. EQ: Explain verbally and via diagrams, the parts of an atom and their roles. EQ: Using element cues identify groupings of elements based on their atomic arrangement.	of atoms by illustrating models of atoms and identifying periodic trends of elements arranged in the periodic table.	CK 12: Metals CK 12: Nonmetals CK 12: Metalloids	Metals, Nonmetals, Metalloids Lab: Students identify/classify classroom items. **Crystal Lab: Honors Crystal Lab **Microscope Crystals: Honors Crystals	Informal Assessments: Bell work/exit slips/class lectures/discussions/check for understanding/guided reading answers/HW Formal Assessments: Atoms & Periodic Table Test 80% of students will average a score of 80% on unit assessments.	predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.
Chemical Reactions	The study of chemical reactions examines the types of chemical bonds, reaction energies, and properties of specific reactions. EQ: Identify the different types of chemical bonds and the molecular compounds these bonds create. EQ: Name compounds understanding nomenclature depends on types of bonds. EQ: Combine molecular formulas and balance chemical equations.	Students will demonstrate knowledge of chemical reactions by illustrating chemical bonds, naming/writing formulas for compounds, balancing equations, and identifying chemical reaction types. Develop a model to show the release or absorption of energy from a chemical reaction. Explain the effects of changing temperature or concentration of reacting particles on the rate of reaction.	CK 12: Covalent Bonds CK 12: Ionic Bonds CK 12: Ionic Compounds	Chemistry Practice: 1) Polyatomic Ions-Notes and Practice Problems 2) Common Polyatomic Ions Table-http://home.miraclista.edu/dlr/names.htm 3) Ionic Compounds Containing Transition Metals 4) Ionic Compounds Summary **Ionic/Covalent Bonds: Honors Guide **Polyatomics: Honors Practice	Informal Assessments: Bell work/exit slips/class lectures/discussions/check for understanding/guided reading answers/HW Formal Assessments: Atoms & Periodic Table Test 80% of students will average a score of 80% on unit assessments.	PS1-2: Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties. PS1-4: Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.
Electromagnetic Waves and Their Applications	The study of light explores the electromagnetic spectrum, light, and optics. Topics:	Students will use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed	CK 12: EM Waves Slide Show: Waves Cornell Notes: Wave Energy	EM Wave Poster	Informal Assessments: Bell work/exit slips/class lectures/discussions/check for understanding/guided reading answers/HW Formal Assessments:	PS 4-3: Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle

	The Electromagnetic Spectrum and Light Optics	of waves traveling in various media. EQ: Connect what our eyes and ears are actually sensing when our brains see different colors or hear different sounds. EQ: Students will demonstrate knowledge of electromagnetic spectrum, light, and optics by understanding and applying concepts to their lives.	CK 12: Radio Waves CK 12: Microwave Radiation (1) Microwave Radiation (2) CK 12: Infrared Radiation CK 12: Visible Light CK 12: Infrared Radiation CK 12: X-Ray CK 12: Gamma Radiation		EM Test, quizzes, assignments, bell work, homework, class work, labs. 80% of students will average a score of 80% on unit assessments.	model, and that for some situations one model is more useful than the other.
Energy	The study of energy applies the laws of energy to different types of energies and waves. Topics: Energy Light Energy Thermal Energy and Heat Mechanical Waves and Sound	Students will know the forces involved in simple harmonic motion, the concepts of wave motion, the concepts of pendulum motion, what the Doppler Effect is, how to measure sound intensity, and work with standing waves on a string or in pipes. EQ: How do we use principles of wave motion to solve problems involving sound. Students will know the components of the electromagnetic	CK12:Energy Cornell Notes: What is Energy? CK12: Sound CK 12: Light Slide Show: What is Light Slides EM Spectrum Guide CK 12: Thermal Energy Cornell Notes:	Sound Lab Stations of Light Lab Light Energy Worksheet Thermal Insulation Lab Thermal Bottle Lab **Bird House Lab	Informal Assessments: Bell work/exit slips/class lectures/discussions/check for understanding/guided reading answers/HW Formal Assessments: Energy Test, quizzes, assignments, bell work, homework, class work, labs. 80% of students will average a score of 80% on unit assessments.	PS 4-1:Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media. PS 4-5:Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.

		spectrum, how light reflects in flat, concave and convex mirrors, the phenomenon of polarization, how light refracts in different media, and natural phenomena associated with light refraction. EQ: How do we use the nature of light to solve problems involving reflection and refraction? EQ: Explain the role energy plays in all forms of matter. EQ: Students will visually and verbally explain how waves move and transfer information.	Thermal Energy Notes Template CK 12: Thermal Radiation			
Forces	Topics: Speed Velocity Acceleration Newton's Laws	Students will know what force is, be able to apply Newton's Laws of Motion to cases involving mass, acceleration, and inertia, and understand weight, friction and normal force. EQ: How do we use Newton's Laws of Motion to solve problems involving force?	CK12: Speed CK12: Velocity Slide Show: Velocity & Energy Slides Cornell Notes: Velocity Notes Slide Show: Velocity & Acceleration Slide Show Cornell Notes: Velocity & Acceleration	Speed Trap Lab Velocity Lab Slide Show Velocity Lab Guide/Handout Calorimetry Lab Marble Lab	Informal Assessments: Teacher questioning/class discussion, bell work/exit slips/class lectures/discussions/check for understanding/guided reading answers/HW Formal Assessments: Forces Test, quizzes, assignments, bell work, homework, class work, labs. Evidence Outcomes: Students can describe Newton's Laws of Motion to	NGSSS SC.912.P.12.3 NGSSS SC.912.P.12.7

			CK 12: Newton's First Law Google Slides: Motion and Forces CK 12: Newton's Second Law Google Slides: Newton's Second Law of Motion Slide Show Notes: Google Slide Show Notes Worksheet: Newton's 2nd Law Problem Set CK12: Newton's Third Law Google Slides: Accelerated Motion Cornell Notes: Newton's Third Law Notes Template		cases involving mass, acceleration, and inertia, and understand weight, friction and normal force. 80% of students will average a score of 80% on unit assessments.	
Astronomy	Describe and interpret how Earth's geologic history and place in space are relevant to our understanding of the processes that have shaped our planet. Topics: Seasons	EQ: What causes different seasons in different parts of the world? EQ: What causes lunar and solar eclipses and why do they occur in different parts of the world?	CK 12: Sun Cornell Notes: Sun Notes CK 12: Electromagnetism	Sundial Lab Gravity and Orbits Lab Magnets and Compass Lab Star Wheel Lab	Informal Assessments: Bell work/exit slips/class lectures/discussions/check for understanding/guided reading answers/HW Formal Assessments: Solar System Test	HS-ESS1-6: Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history.

	Eclipses Orbital Path Time Stars	EQ: What is the relationship between the positions and motions of the Sun and Earth and the days and years we experience on the Earth? EQ: Why do we see different stars at different times of the year.	CK 12: Earth as a Magnet Cornell Notes: Gravity and Magnetism CK 12: Revolutions of the Earth CK 12: Inner Planets Cornell Notes:Inner Planets Notes CK 12: Outer Planets Cornell Notes: Outer Planets Notes CK 12: Stars CK 12: Moon CK 12: Other Objects Cornell Notes: Moon and Other Objects Notes		Evidence Outcomes: Students can describe how relative positions and motions can explain the seasons, length of days and years on a planet, lunar and solar eclipses on Earth and lunar phases. Students can describe the reason that the appearance of the night sky and positions of the stars changes at different times. 80% of students will average a score of 80% on unit assessments.	HS- ESS2-4 : Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.
Plate Tectonics	Students will explain real-life phenomena caused by the convection of the Earth's mantle. Students will predict the consequences of this motion on humans and	The outward transfer of Earth's internal heat drives convection circulation in the mantle. This causes the crustal plates to move on the face of the Earth. EQ: What causes earthquakes and how do	CK 12: Inside the Earth Cornell Notes: Earth's Layers Notes CK 12: Convergent Boundaries	Earth's Layers Foldable PHET Plate Tectonics Lab Plate Tectonics Quest	Informal Assessments: Bell work/exit slips/class lectures/discussions/check for understanding/guided reading answers/HW Formal Assessments: Plate Tectonics Test	ESS-1-5 examine internal and external sources of energy. ESS-2-2 examine how internal sources of energy propel crustal plates across the face of the globe.

	other living things on the planet. Topics: Pangea Earth's Layers Convergent Boundaries Divergent Boundaries Transform Fault Boundaries	they affect Earth's surface? EQ: How are earthquakes and the destruction they cause measured?	CK 12: Divergent Boundaries CK12: Transform Fault Boundaries	Reading & Questions: Ring of Fire Lab: Tectonic Plates, Earthquakes, and Volcanoes	Evidence Outcomes: Students can describe how the Earth's layers are defined. Students can describe how plate tectonics explains the creation of continents and land formations. 80% of students will average a score of 80% on unit assessments.	ESS-10 examine and interpret ongoing changes of the Earth system (e.g., earthquakes, mountain building).
Biogeochemical Cycles	Natural processes that recycle nutrients in various chemical forms from the nonliving environment to living organisms and then back to the nonliving environment. Examples are the carbon, oxygen, nitrogen, phosphorus, sulfur, and hydrologic cycles. Topics: Energy Flow Water Carbon Nitrogen Phosphorus Eutrophication Global Climate	Students will use information from this unit to create a "booklet" about the biogeochemical cycles. They will include student-created diagrams as well as explanations. Students will write a brief reflection of their findings and propose some solutions to the negative impacts humans place on these cycles. EQ: How can human activities impact the nitrogen and carbon cycles?	CK 12: Water Cycle CK 12: Carbon Cycle Cornell Notes: Biogeochemical Cycles CK 12: Nitrogen Cycle CK 12: Mineral Formation Cornell Notes: Mineral Formation CK 12: Rock Cycle Cornell Notes: Rock Cycle Notes CK 12: Renewable Resources CK 12: Non Renewable Resources	Create Examples of Energy Flow Virtual Lab: Mineral ID Lab Mineral Formation Lab	Informal Assessments: Bell work/exit slips/class lectures/discussions/check for understanding/guided reading answers/HW Formal Assessments: Biogeochemical Cycles Test Evidence Outcomes: Students can describe how the Earth's layers are defined. Students can describe how biogeochemical cycles 80% of students will average a score of 80% on unit assessments.	HS-ESS3-6: Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

			Cornell Notes: Earth's Energy			
Earth's Atmosphere & Weather	Earth systems have sources of energy that are internal and external to the Earth. The Sun is the major external source of energy. Two primary sources of internal energy are the decay of radioactive isotopes and the gravitational energy from Earth's original formation. Topics: Ozone Troposphere Stratosphere Mesosphere Thermosphere Exosphere Radiation Conduction Convection Dew point Condensation Humidity Relative humidity Meteorology Weather Air mass Coriolis effect Jet stream Thermometer Barometer Thunderstorm Tornado Hurricane	Global climate is determined by energy transfer from the Sun at and near Earth's surface. This energy transfer is influenced by dynamic processes such as cloud cover and the Earth's rotation and static conditions such as the position of mountain ranges and oceans. Interactions among the solid Earth, the oceans, the atmosphere, and living things have resulted in the ongoing development of a changing Earth system. EQ: What are the composition, structure, and properties that make up Earth's atmosphere? EQ: How does water continually move between Earth's surface and the atmosphere? EQ: How do air masses move and change and what weather conditions result from this movement?	CK 12: Earth's Atmosphere Cornell Notes: Earth's Atmosphere CK 12: Temperature of the Atmosphere Cornell Notes: Temperature CK 12: Mesosphere CK 12: Thermosphere CK 12: EM Radiation Cornell Notes: Mesosphere, Thermosphere, EM Radiation CK 12: Troposphere CK 12: Stratosphere Cornell Notes: Troposphere & Stratosphere	PHET Lab: States of Matter Current Event: Joe Kittenger's Jump Clip: Joe Kittenger's Jump Demo: Convection with Hot/Cold Water and dye. Tornado Data: Tornado Frequency Anemometer Lab Weather Webquest	Informal Assessments: Bell work/exit slips/class lectures/discussions/check for understanding/guided reading answers/HW Formal Assessments: Atmosphere/Weather Test Evidence Outcomes: Students can describe how the Earth's layers are defined. Students can describe how plate tectonics explains the creation of continents and land formations. 80% of students will average a score of 80% on unit assessments.	SC-HS-4.6.8 Students will describe the connections between the functioning of the Earth system and its sources of energy (internal and external). Students will predict the consequences of changes to any component of the Earth system. SC-HS-4.6.9 Students will explain the cause and effect relationship between global climate and weather patterns and energy transfer (cloud cover, location of mountain ranges, oceans). Students will predict the consequences of changes to the global climate and weather patterns.

		EQ:How do thunderstorms, tornadoes, and hurricanes form?	CK 12: Heat Transfer CK 12: Weather vs. Climate CK 12: Clouds Cornell Notes: Clouds/Weather Notes CK 12: Coriolis Effect CK 12: Global Winds CK 12: Local Winds Cornell Notes: Winds Notes CK 12: Weather Maps Cornell Notes: Reading Weather Maps			
Geologic Time	Students will compare the limitations/benefits of various techniques (radioactive dating, observing rock sequences, and comparing fossils) for estimating geological time. Students will justify deductions about age of geologic features. Topics: Geologic time scale	Techniques used to estimate geological time include using radioactive dating, observing rock sequences, and comparing fossils to correlate the rock sequences at various locations. EQ: How do geologists divide Earth's long history? EQ: How can certain geologic principles be	Slide Show: Geologic Time Slide Show: Relative Age Slide Show: Absolute Age Notes: Absolute Age Notes Slide Show: Fossils	Guide: Relative vs. Absolute Age Online Lab: Fossils Fossils Lab: Fossils Impressions Lab	Informal Assessments: Bell work/exit slips/class lectures/discussions/check for understanding/guided reading answers/HW Formal Assessments: Geologic Time Test Evidence Outcomes: Students can describe how the Earth's layers are defined. Students can describe how plate tectonics explains the	SC-HS-4.7.4 Students will understand that evidence for one-celled forms of life, the bacteria, extends back more than 3.5 billion years. The changes in life over time caused dramatic changes in the composition of the Earth's atmosphere, which did not originally contain oxygen.

	Eon, Era, Period, Epoch Uniformitarianism Principle of superposition Principle of original horizontality Principle of crosscutting relationships	used to interpret relative age in layered rocks? EQ: How are different techniques used to determine the absolute ages of rocks?	Notes: Fossils		creation of continents and land formations. 80% of students will average a score of 80% on unit assessments.	
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