

**GRADE 8 - PHYSICAL SCIENCE /ADVANCE – 2003010 / 2003020
CURRICULUM MAP SUMMARY 2015-2016**

MFA#	IFC Standards	Topic Covered	Number of Days
	SC.8.N.1.5 SC.8.N.1.6 SC.8.N.2.1 SC.8.N.2.2	Orientation, Team Building, Classroom safety procedures and expectations, Lab Safety, Lab equipment, Lab skills, Measurements, What is Science?, and Pre-Assessment	5
	SC.8.N.3.1 SC.8.N.3.2	Practice of Science, scientific process, steps of scientific method, credibility and validity of scientific claims, Science vs. Pseudoscience, Scientific Models, Development of Theories in Science	4
	SC.8.N.1.1 SC.8.N.1.2 SC.8.N.1.3 SC.8.N.1.4	Scientific Investigations, Testable hypothesis, Dependent & Independent variables, Importance of repeated trials, Importance of communicating results	5
	SC.8.N.3.1 SC.8.N.4.1 SC.8.N.4.2	Representing Data, Interpretation and analysis of data, Reliability and Validity of Scientific Claims, Evidence from data, Repeated trials, Science and Society, Importance of ethics in scientific research and reporting	5
	SC.8.P.8.2 SC.8.P.8.3 SC.8.P.8.4 SC.8.P.9.1 SC.8.P.9.2 SC.8.P.9.3 SC.8.N.1.6	Introduction to Matter, Properties of Matter, Physical and Chemical Changes	17
	SC.8.N.1.1 SC.8.N.3.1 SC.8.P.8.1 SC.8.P.8.5 SC.8.P.8.8 SC.8.P.8.9 SC.8.P.8.7 SC.8.P.8.6	States of Matter and Pure Substances and Mixtures, The Atom and The Periodic Table	20

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	SC.7.N.1.1 SC.7.P.10.3 SC.7.P.10.3 SC.7.P.10.1 SC.7.P.10.2 SC.7.P.10.3	Waves and Properties of Waves, The Electromagnetic Spectrum and Interactions of Light	18
	SC.7.P.11.2 SC.7.P.11.3 SC.7.P.11.1 SC.7.P.11.4 SC.7.P.11.1 SC.7.P.11.4 SC.7.N.1.1	Energy Conversions and Conservation, Temperature, Thermal Energy and Heat	15
	SC.6.P.11.1 SC.6.P.12.1 MA.6.A.3.6	Kinetic and Potential Energy, Motion and Speed, and Acceleration	12
	SC.6.P.13.1 SC.6.P.13.3 MA.6.A.3.6 SC.6.P.13.1 SC.6.P.13.2	Forces and Gravity and Motion	14
		SCIENCE FCAT EXAM	
		Family Life/Human Sexuality Curriculum BEEP	5
		HIV/AIDS Curriculum BEEP	5
		Optional Science Activities	Remainder of School Year

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PHYSICAL SCIENCE		COURSE CODE: 2003010	
PHYSICAL SCIENCE ADVANCE		2003020	
Unit#: 1	Unit Title: Introduction & Nature of Science	Based on 12 days Total Contact Days (1 Day equals approximately 1 class period)	
Body of Knowledge: Nature of Science		Pacing: 12/120 (10%)	
Standards: 1 - The Practice of Science; 2 - Characteristics of Scientific Knowledge; 3 – The Roles of Theories, Laws, Hypotheses, and Models		Schedule Type	Pacing (Days)
		Traditional	12
		Block	6
Essential Questions 1. How is science different from other fields of study? 2. How do we know about the world we live in? 3. How do scientists work? 4. In what ways can you organize data to fully understand them? (Lesson 4) 5. How does science affect our lives?		Standards Notes: Nature of Science Benchmarks should be taught ALL year. The following standards below are included in the <u>Physical Science</u> Course Description, but are not (assessed) on the FCAT 2.0 Science Assessment. SC.8.N.2.1 Distinguish between scientific and pseudoscientific ideas. SC.8.N.2.2 Discuss what characterizes science and its methods.	

Essential Content	Benchmarks (DOK): Objectives and Skills www.floridastandards.org	Instructional Resources: (select benchmark specific resource)	Instruction Strategies: (recommended activities and labs)	Benchmark Clarifications / Learning goals (BC) & Content Limits (CL)
Classroom orientation and safety procedures		SBBC Broward Safety Manual Safety Contract Pages R16, R17 in Science Fusion: Physical Science Discovery Education (log-in through BEEP) <ul style="list-style-type: none"> Lesson Activity - What Not To Do Lesson Activity – What Not To Do AnswerKey Video - Lab Safety and Compliance Video Video - Accident at Jefferson High Lab Activity - Accuracy and Precision Lab Lab Safety Memorial Lab 	Team building activity. Students sign and return Safety contract Lab Rules and Consequences Activity Stations – Create stations available where students can practice taking measurements in the science lab using Gizmo (one laptop available per station) and lab safety scenario incidents for the students to dissect and cite violations. If Gizmo access is not available then teacher can project and discuss how measurements are taken and allow students to perform a measurement lab in class in rotations.	
KEY TERMS (This list is not limited to all possible vocabulary within a specific unit): goggles, apron, beaker, broken glass, fire blanket, eyewash, science, reliability, investigations, empirical evidence, inference, observations				

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<p>Methods used to develop scientific explanation – Investigating Matter</p> <ul style="list-style-type: none"> Scientific thinking and problem solving usage in scientific investigation Experimental (Controlled vs. Natural) procedure used to identify design flaw Observational Investigation Descriptive Research 	<p>SC.8.N.1.5 (3): Analyze the methods used to develop a scientific explanation as seen in different fields of science. <i>(Assessed as SC.7.N.1.5 (2))</i></p> <p>SC.8.N.1.6 (2): Understand that scientific investigations involve the collection of relevant empirical evidence, the use of logical reasoning, and the application of imagination in devising hypotheses, predictions, explanations and models to make sense of the collected evidence. <i>(Assessed as SC.6.N.2.2 (2))</i></p> <p>SC.8.N.2.1 (2): Distinguish between scientific and pseudoscientific ideas. <i>(Not Assessed)</i></p> <p>SC.8.N.2.2 (2): Discuss what characterizes science and its methods. <i>(Not Assessed)</i></p>	<p>Florida Science Fusion: www.thinkcentral.com  https://app.discoveryeducation.com/learn/videos/2A63EC31-9A53-4254-9ABF-1C5295A4A26D  Scientific Method  Scientific Inquiry Activities, Scientific Methods  Glencoe How is a controlled experiment performed? Scientific Methods  Experimental Design  CPALMS Resources NASA Beginning Engineering, Science and Technology http://www.cpalms.org/Public/PreviewResource/Preview/22522</p>	<p> ExploreLearning Gizmos: SC.8.N.1.5 • Pendulum Clock SC.8.N.1.6 • Effect of Temperature on Gender</p> <p>Science Fair Project: Independent student research and experimentation</p> <p>Enrichment Activities Science Fair Science Olympiad</p> <p>Informational Text (Reading) Activity-</p>	<p>Benchmark Clarifications SC.8.N.1.5: 1. Students will describe and/or analyze common methods and/or models used in different fields of study. 2. Students will identify the benefits and/or limitations of the use of scientific models. 3. Students will identify how technology is essential to science.</p> <p>Content Limits SC.8.N.1.5: 1. Items assessing technology will focus on the role of technology in science as opposed to specific technologies.</p> <p>Benchmark Clarifications SC.6.N.2.2: 1. Students will explain that scientific knowledge may change as new evidence is discovered or new scientific interpretations are formed. 2. Students will explain that scientific explanations are based on empirical evidence, logical reasoning, predictions, and modeling. 2. Students will identify instances in the history of science in which scientific knowledge has changed as a result of new evidence.</p> <p>Content Limits SC.6.N.2.2: 1. Items will not require identification of the scientist(s) and/or details associated with a particular event/discovery.</p>
<p>KEY TERMS <i>(This list is not limited to all possible vocabulary within a specific unit):</i> analyze, scientific explanation, understand, scientific investigation, empirical evidence, logical reasoning, application of imagination, devise hypotheses, prediction, models, distinguish, discuss, pseudoscience.</p>				
<p>Analyzing common methods and models used</p> <p>Types of Scientific Explanations</p> <ul style="list-style-type: none"> Theory vs. Laws 	<p>SC.8.N.3.1 (3) Select models useful in relating the results of their own investigations. <i>(Not Assessed)</i></p> <p>SC.8.N.3.2 (3) Explain why theories may be modified but are rarely discarded.</p>	<p>Florida Science Fusion: www.thinkcentral.com  CPALMS Resources SuperModels of Science http://publications.nigms.nih.gov/classroom/supermodels/intro.html</p>	<p>Science Fair Project: Independent student research and experimentation</p> <p>Enrichment Activities Science Fair Science Olympiad</p>	<p>Benchmark Clarifications SC.8.N.3.2: 1. Students will explain the difference between theories and laws. 2. Students will identify examples of theories and/or laws. 3. Students will explain why theories may be modified but are rarely discarded.</p> <p>Content Limits SC.8.N.3.2: 1. Items addressing scientific theories and/or laws are limited to those found in the middle school science benchmarks, such as law of universal gravitation, law of superposition, theory of plate tectonics, atomic theory, law of conservation of mass, law of</p>


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				conservation of energy, cell theory, and the scientific theory of evolution.
KEY TERMS (This list is not limited to all possible vocabulary within a specific unit): explain, theory, laws, models, law of universal gravitation, law of superposition, theory of plate tectonics, atomic theory, law of conservation of mass, law of conservation of energy, cell theory, and the scientific theory of evolution.				
Types of scientific investigations Parts of scientific investigations Scientific Processes – Studying Matter • Observation in Properties of Matter • Inference/Hypothesis related to Matter and its Properties • Experiment (Control Group and Experimental Group) • Variables (Test, Outcome, and Constant) • Repetition & Replication	SC.8.N.1.1 (3) Define a problem from the eighth grade curriculum using appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions. SC.8.N.1.2 (3) Design and conduct a study using repeated trials and replication. SC.8.N.1.3 (2) Use phrases such as "results support" or "fail to support" in science, understanding that science does not offer conclusive 'proof' of a knowledge claim. SC.8.N.1.4 (3) Explain how hypotheses are valuable if they lead to further investigations, even if they turn out not to be supported by the data.	Florida Science Fusion: www.thinkcentral.com  CPALMS Resources New York Balance http://www.cpalms.org/Public/PreviewResource/Preview/124475 Ancient Archery: Scientific Method and Engineering http://www.cpalms.org/Public/PreviewResourceLesson/Preview/54384 How Science Works: Flowchart http://www.cpalms.org/Public/PreviewResource/Preview/50362  Discovery Education Scientific Method and Measurement https://app.discoveryeducation.com/learn/videos/3CDA9895-5BD1-4559-AC00-EF4E252BD55F	Advanced: Quick Lab, The Importance of Replication Counting Chocolate Chips in Cookies Lab: All about replication, allowing students to design the experiment, THEN talk about using the same procedures at the end. URL: http://serc.carlton.edu/files/sp/cause/conjecture/examples/directions_for_chips_ahoy.pdf  ExploreLearning Gizmos: • Force and Fan Carts • Triple Beam Balance • pH Analysis • Mystery Powder Analysis	Benchmark Clarifications SC.8.N.1.1: 1. Students will evaluate a scientific investigation using evidence of scientific thinking and/or problem solving. 2. Students will identify test variables (independent variables) and/or outcome variables (dependent variables) in a given scientific investigation. 3. Students will interpret and/or analyze data to make predictions and/or defend conclusions. 4. Students will distinguish between an experiment and other types of scientific investigations where variables cannot be controlled. 5. Students will explain how hypotheses are valuable. Content Limits SC.8.N.1.1: 1. Items addressing hypotheses will not assess whether the hypothesis is supported by data. 2. Items will not address or assess replication, repetition, or the difference between replication and repetition. Benchmark Clarifications SC.8.N.1.1: 1. Students will differentiate between replication and repetition. 2. Students will explain why scientific investigations should be replicable. 3. Students will compare methods and/or results obtained in a scientific investigation. 4. Students will evaluate the use of repeated trials or replication in a scientific investigation.
KEY TERMS (This list is not limited to all possible vocabulary within a specific unit): define, explain, evaluate, interpret, analyze, predict, defend, distinguish, science, experiment, scientific investigation, observations, inference, hypothesis, test variable, outcome variable, controlled variable, data, inquiry, claim, empirical evidence, reasoning, predicting, trial, repetition, replication, results support, results fail to support, analyze				
Making sense of Data • Experiment (Control Group and Experimental Group) • Variables (Test, Outcome, and Constant) • Repetition & Replication	SC.8.N.3.1 (3) Select models useful in relating the results of their own investigations. (Not Assessed)	Florida Science Fusion: www.thinkcentral.com  CPALMS Resources Tablet of Knowledge MEA http://www.cpalms.org/Public/PreviewResource/Preview/67405  Gizmos www.explorellearning.com	URL: http://www.teachology.com/worksheets/math/graph/ Enrichment Activities Science Fair Science Olympiad	N/A

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Types of models		ExploreLearning Gizmos: <ul style="list-style-type: none"> • Graphing Skills • Reaction Time 1 (Graphs and Statistics) • Describing Data Using Statistics 		
KEY TERMS (This list is not limited to all possible vocabulary within a specific unit): science, experiment, scientific investigation, observations, inference, hypothesis, test variable, outcome variable, controlled variable, data, inquiry, claim, empirical evidence, reasoning, predicting, trial, repetition, replication, results support, results fail to support, analyze, bar graph, line graph, circle graph, physical model, mathematical model				
Science and Society	<p>SC.8.N.4.1 (2) Explain that science is one of the processes that can be used to inform decision making at the community, state, national, and international levels. <i>(Not Assessed)</i></p> <p>SC.8.N.4.2 Explain how political, social, and economic concerns can affect science, and vice versa. <i>(Not Assessed)</i></p>	<p>Florida Science Fusion: www.thinkcentral.com</p> <p> CPALMS Resources Burning to Learn http://www.cpalms.org/Public/PreviewResource/Preview/66176</p> <p>Informational Text Resources for Florida Standards</p> <ul style="list-style-type: none"> • Spiders In Your Fruit: A Good Thing http://www.cpalms.org/Public/PreviewResource/Preview/56171 	<p>Read and select a content area passage. Give students a text coding bookmark and allow them to code the text. Teacher or students create Text Dependent Questions and pass them around for students to answer in their notebook using complete sentences.</p> <p>Enrichment Activities Science Fair Science Olympiad</p>	N/A
KEY TERMS (This list is not limited to all possible vocabulary within a specific unit):				

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PHYSICAL SCIENCE		COURSE CODE: 2003010	
PHYSICAL SCIENCE ADVANCE		2003020	
Unit#: II	Unit Title: Matter	Based on 37 days Total Contact Days (1 Day equals approximately 1 class period)	
Body of Knowledge: Physical Science		Pacing: 37/120 (31%)	
Standards: 8 – Properties of Matter, 9 – Changes in Matter		Schedule Type	Pacing (Days)
		Traditional	37
		Block	18
Essential Questions		Standards Notes: Nature of Science Benchmarks should be taught ALL year.	
<ul style="list-style-type: none"> What properties define matter? What are Physical and Chemical Properties of Matter? What are physical and chemical changes in matter? How do particles in solids, liquids, and gases move? How do pure substances and mixtures compare? What makes up an atom? How are elements arranged on the periodic table? 		<p>The following standards below are included in the <u>Physical Science</u> Course Description, but are not (assessed) on the FCAT 2.0 Science Assessment.</p> <p>SC.8.N.2.1 Distinguish between scientific and pseudoscientific ideas.</p> <p>SC.8.N.2.2 Discuss what characterizes science and its methods.</p>	

Essential Content	Benchmarks (DOK): Objectives and Skills www.floridastandards.org	Instructional Resources: (select benchmark specific resource)	Instructional Strategies: (recommended activities and labs)	Benchmark Clarifications / Learning goals (BC) & Content Limits (CL)
Properties of Matter Measuring Matter	<p>SC.8.P.8.2 (2): Differentiate between weight and mass recognizing that weight is the amount of gravitational pull on an object and is distinct from, though proportional to, mass. (Assessed as SC.6.P.13.1)</p> <p>SC.8.P.8.3 (2): Explore and describe the densities of various materials through measurement of their masses and volumes. (Assessed as SC.8.P.8.4)</p>	<p>Florida Science Fusion: www.thinkcentral.com</p> <p>CPALMS Resources Sink or Swim http://www.cpalms.org/Public/PreviewResource/Preview/128545 Edible Mass vs. Weight http://www.cpalms.org/Public/PreviewResource/Preview/76462</p> <p>Informational Text Resources for Florida Standards</p> <ul style="list-style-type: none"> Will the World's Newest Lightest Material Be Instrumental in Cleaning Up Toxic Oil Spills? http://www.cpalms.org/Public/PreviewResource/Preview/66765 	<p>Density of Candy bars URL: http://www.prentice.org/ourpages/auto/2009/5/17/56561584/Density%20Sweet%20Density%20Lab.doc</p> <p>Gizmos www.explorelearning.com</p> <p>ExploreLearning Gizmos:</p> <ul style="list-style-type: none"> Density Laboratory Density via Comparison Density Experiment: Slice and Dice Determining Density via Water Displacement Density Weight and Mass 	<p>Benchmark Clarifications SC.6.P.13.1: 1. Students will identify and/or describe types of forces. 2. Students will describe the relationship among distance, mass, and gravitational force between any two objects. 3. Students will differentiate between mass and weight.</p> <p>Content Limits SC.6.P.13.1: 1. Items assessing gravity will use a conceptual understanding of the Law of Universal Gravitation by keeping either the mass or distance constant. 2. Items will not assess nuclear forces. 3. Items will not require the use of formulas or calculations.</p> <p>Benchmark Clarifications SC.8.P.8.4: 1. Students will classify and/or compare substances on the basis of their physical properties and/or explain that these properties are independent of the amount of the sample. 2. Students will describe density and/or calculate and compare the densities of various materials using the materials' masses and volumes.</p> <p>Content Limits SC.8.P.8.4: 1. Items may require use of the density formula to calculate density, mass, or volume when comparing substances. 2. Items that assess conductivity, solubility, or magnetic properties will be at a conceptual level only. Items will not require calculations for these topics. 3. Items addressing solubility may include the terms <i>solvent</i>, <i>solute</i>, and <i>saturation</i>. Items may assess the concept of saturation. 4. Items will not require memorization of the specific melting points and/or boiling points of substances.</p>

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KEY TERMS (This list is not limited to all possible vocabulary within a specific unit): differentiate, explore, describe, measurements, gravitational pull, matter, mass, weight, volume, density,

<p>Properties of Matter</p> <ul style="list-style-type: none"> Physical property Chemical property 	<p>SC.8.P.8.4 (2): Classify and compare substances on the basis of characteristic physical properties that can be demonstrated or measured; for example, density, thermal or electrical conductivity, solubility, magnetic properties, melting and boiling points, and know that these properties are independent of the amount of the sample.</p>	<p>Florida Science Fusion: www.thinkcentral.com</p> <p> CPALMS Resources Crime Scene Density Lab http://www.cpalms.org/Public/PreviewResource/Preview/76534 Determining the density of regular and irregular objects http://www.cpalms.org/Public/PreviewResourceLesson/Preview/48932</p> <p> Gizmos www.gizmoslearning.com ExploreLearning Gizmos:</p> <ul style="list-style-type: none"> Density Laboratory Density Mystery Powder Analysis pH Analysis Mineral Identification Circuit Builder <p>Informational Text Resources for Florida Standards</p> <ul style="list-style-type: none"> https://student.societyforscience.org/article/heat-resistant-makeup 	<p>Quick Labs:</p> <ul style="list-style-type: none"> Natural vs. Synthetic Fibers <p>Advanced: Guided Inquiry - Will it sink or float?</p> <p>Use various physical properties to separate a mixture into separate parts. Explain how physical properties help isolate/remove each part of the mixture. Discuss how the separation would work in a larger or smaller size/volume of the mixture.</p> <p>Enrichment Activities Science Fair Science Olympiad</p>	<p>Benchmark Clarifications SC.8.P.8.4: 1. Students will classify and/or compare substances on the basis of their physical properties and/or explain that these properties are independent of the amount of the sample. 2. Students will describe density and/or calculate and compare the densities of various materials using the materials' masses and volumes.</p> <p>Content Limits SC.8.P.8.4: 1. Items may require use of the density formula to calculate density, mass, or volume when comparing substances. 2. Items that assess conductivity, solubility, or magnetic properties will be at a conceptual level only. Items will not require calculations for these topics. 3. Items addressing solubility may include the terms <i>solvent</i>, <i>solute</i>, and <i>saturation</i>. Items may assess the concept of saturation. 4. Items will not require memorization of the specific melting points and/or boiling points of substances.</p>
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KEY TERMS (This list is not limited to all possible vocabulary within a specific unit): classify, compare, measure, demonstrate, independent, physical property, density, thermal conductivity, electrical conductivity, solubility, magnetic properties, melting point and boiling point.



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Changes in observable properties of matter	SC.8.P.9.2 (2): Differentiate between physical changes and chemical changes.	Florida Science Fusion: www.thinkcentral.com	Nylon Rope Trick – Innovative Science activity from Fisher Scientific. Product # S76784A	Benchmark Clarifications SC.8.P.9.2: 1. Students will differentiate between physical and chemical changes. 2. Students will explain that mass is conserved when substances undergo physical and chemical changes, according to the Law of Conservation of Mass. 3. Students will describe how temperature influences chemical changes.
Evidence of Chemical Changes	SC.8.P.9.1 (3): Explore the Law of Conservation of Mass by demonstrating and concluding that mass is conserved when substances undergo physical and chemical changes. <i>(Assessed as SC.8.P.9.2)</i>	 CPALMS Resources Lord of Fries Conservation - MEA http://www.cpalms.org/Public/PreviewResourceLesson/Preview/67962	Compare & Contrast Chart (CRISS)	Content Limits SC.8.P.9.2: 1. Items will not require balancing equations or analysis of chemical formulas. 2. Items will focus on a conceptual understanding of the Law of Conservation of Mass; items will not require mathematical computations. 3. Items will not assess reaction rates.
Conserving mass	SC.8.P.9.3 (3): Investigate and describe how temperature influences chemical changes. <i>(Assessed as SC.8.P.9.2)</i>	Chemical or Physical Change? That is the Question! http://www.cpalms.org/Public/PreviewResource/Preview/20148	http://www.fishersci.com:80/ecommerce/servlet/fsproductdetail?storeId=10652&productId=696807&catalogId=29104&matchedCatNo=S76784A&endecaSearchQuery=%23store%3DScentic%23N%3D0%23rpp%3D15&fromSearch=1&searchKey=S76784A&highlightProduct.sItemsFlag=Y	Benchmark Clarifications SC.8.N.1.6: 1. Students will explain that scientific knowledge may change as new evidence is discovered or new scientific interpretations are formed. 2. Students will explain that scientific explanations are based on empirical evidence, logical reasoning, predictions, and modeling. 3. Students will identify instances in the history of science in which scientific knowledge has changed as a result of new evidence.
	SC.8.N.1.6: Understand that scientific investigations involve the collection of relevant empirical evidence, the use of logical reasoning, and the application of imagination in devising hypotheses, predictions, explanations and models to make sense of the collected evidence.	The Nerve to Conserve http://www.cpalms.org/Public/PreviewResource/Preview/76429		Content Limits SC.8.N.1.6: 1. Items will not require identification of the scientist(s) and/or details associated with a particular event/discovery. 2. Items will not use the term <i>durable</i> .
		 Brain POP https://www.brainpop.com/science/matterandchemistry/propertychange/s/		
		 Gizmos ExploreLearning Gizmos: <ul style="list-style-type: none">• Phases of Water• Mystery Powder Analysis• Mineral Identification• Balancing Chemical Equations		
KEY TERMS <i>(This list is not limited to all possible vocabulary within a specific unit):</i> explore, demonstrate, conclude, differentiate, investigate, describe, mass, physical changes, chemical changes, law of conservation of mass				


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<p>Kinetic Theory of Matter</p>	<p>SC.8.P.8.1 (2): Explore the scientific theory of atoms (also known as atomic theory) by using models to explain the motion of particles in solids, liquids, and gases.</p> <p>SC.8.N.1.1 (3): Define a problem from the eighth grade curriculum using appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.</p> <p>SC.8.N.3.1(3): Select models useful in relating the results of their own investigations. <i>(Not Assessed)</i></p>	<p>Florida Science Fusion: www.thinkcentral.com</p> <p> CPALMS Resources Virtual Manipulative: States of Matter: Basics http://www.cpalms.org/Public/PreviewResource/Preview/51450 The movement of particles in solids, liquids, and gases. http://www.cpalms.org/Public/PreviewResource/Preview/18949</p> <p> ExploreLearning Gizmos:</p> <ul style="list-style-type: none"> • Phase Changes • Temperature and Particle Motion 	<p>States of Matter WebQuest URL: www.whitley.k12.ky.us/pages/mwilson/States%20of%20Matter%20Web-quest.doc</p> <p>Predict Observe Explain (Virtual Simulations)</p> <p>Enrichment Activities Science Fair Science Olympiad</p>	<p>Benchmark Clarification SC.8.P.8.5: 1. Students will describe how elements combine in a multitude of ways to produce compounds that make up all living and nonliving things. 2. Students will describe the motion of particles in solids, liquids, and/or gases. 3. Students will explain that elements are grouped in the periodic table according to similarities of their properties. 4. Students will explain that atoms are the smallest unit of an element and are composed of subatomic particles. 5. Students will identify common examples of acids, bases, and/or salts. 6. Students will compare, contrast, and/or classify the properties of compounds, including acids and bases. 7. Students will differentiate among pure substances, mixtures, and solutions.</p> <p>Content Limit SC.8.P.8.5: 1. Items referring to elements are limited to the elements 1–57 and 72–89. 2. Items referring to subatomic particles will only assess protons, neutrons, and electrons. 3. Items will not assess chemical bonding. 4. Items may assess a conceptual understanding of the pH scale. 5. Items will not require knowledge of the pH of specific substances. 6. Items addressing the properties of acids and bases are limited to pH. 7. Items assessing mixtures and solutions may include components in different states of matter (e.g., gas dissolved in liquid). 8. Items assessing periodic trends must be at the conceptual level. 9. Items will not assess valence electrons or electron configurations.</p>
<p>KEY TERMS <i>(This list is not limited to all possible vocabulary within a specific unit:</i></p>				




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<p>Classifying matter</p>	<p>SC.8.P.8.5: Recognize that there are a finite number of elements and that their atoms combine in a multitude of ways to produce compounds that make up all of the living and nonliving things that we encounter.</p> <p>SC.8.P.8.8: Identify basic examples of and compare and classify the properties of compounds, including acids, bases, and salts. <i>(Assessed as SC.8.P.8.5)</i></p> <p>SC.8.P.8.9: Distinguish among mixtures (including solutions) and pure substances. <i>(Assessed as SC.8.P.8.5)</i></p>	<p>Florida Science Fusion: www.thinkcentral.com</p> <p>Have students explore the physical properties of matter with the “What’s the Matter” activity (http://matse1.matse.illinois.edu/concrete/f.html)</p> <p> ExploreLearning Gizmos:</p> <ul style="list-style-type: none"> • Bohr Model of Hydrogen • Element Builder • Electron Configuration • Ionic Bonding • Covalent Bonding • Balancing Chemical Equations • Solubility and Temperature • Colligative Properties <p>Informational Text Resources for Florida Standards</p> <ul style="list-style-type: none"> • Readworks.org – non-fiction passages • ScienceNews for Kids • K12Reader 	<p>Interactive pH Panel – URL: www.miamisci.org/ph/</p> <p>Where does gold come from? How is it harvested or mined? Use the Youtube video, Modern Day Gold Rush, (https://youtu.be/90e7b7k1SRo) to engage students in the use of physical properties</p> <p>During the video: Have students make observation of the landscape from which gold is mined and describe how the gold is being processed.</p> <p>After the video: Have students discuss the following questions: What processes would need to take place to extract gold from the land? How can physical properties be used to isolate gold from the land?</p>	<p>Benchmark Clarification SC.8.P.8.5: 1. Students will describe how elements combine in a multitude of ways to produce compounds that make up all living and nonliving things. 2. Students will describe the motion of particles in solids, liquids, and/or gases. 3. Students will explain that elements are grouped in the periodic table according to similarities of their properties. 4. Students will explain that atoms are the smallest unit of an element and are composed of subatomic particles. 5. Students will identify common examples of acids, bases, and/or salts. 6. Students will compare, contrast, and/or classify the properties of compounds, including acids and bases. 7. Students will differentiate among pure substances, mixtures, and solutions.</p> <p>Content Limit SC.8.P.8.5: 1. Items referring to elements are limited to the elements 1–57 and 72–89. 2. Items referring to subatomic particles will only assess protons, neutrons, and electrons. 3. Items will not assess chemical bonding. 4. Items may assess a conceptual understanding of the pH scale. 5. Items will not require knowledge of the pH of specific substances. 6. Items addressing the properties of acids and bases are limited to pH. 7. Items assessing mixtures and solutions may include components in different states of matter (e.g., gas dissolved in liquid). 8. Items assessing periodic trends must be at the conceptual level. 9. Items will not assess valence electrons or electron configurations.</p>
<p>KEY TERMS <i>(This list is not limited to all possible vocabulary within a specific unit):</i></p>				


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Atomic structure	<p>SC.8.P.8.7 (1): Explore the scientific theory of atoms (also known as atomic theory) by recognizing that atoms are the smallest unit of an element and are composed of subatomic particles (electrons surrounding a nucleus containing protons and neutrons). (Assessed as SC.8.P.8.5)</p>	<p>Florida Science Fusion: www.thinkcentral.com</p> <p> CPALMS Resources http://www.cpalms.org/Public/PreviewResource/Preview/32738</p> <p> Brain POP https://www.brainpop.com/science/matterandchemistry/atoms/</p> <p> Gizmos www.gizmos.com</p> <p>ExploreLearning Gizmos:</p> <ul style="list-style-type: none"> • Bohr Model of Hydrogen • Element Builder • Electron Configuration <p>Informational Text Resources for Florida Standards</p> <ul style="list-style-type: none"> • Readworks.org – non-fiction passages http://www.readworks.org/ • ScienceNews for Kids https://student.societyforscience.org/sciencenews-students • K12Reader http://www.k12reader.com/ 	<p>Atomic Structure Lab URL: http://www.ttaonline.org/d/sol/Science/Sci6_OT02LN02.pdf</p> <p>After watching videos infuse one of the following CRIS Discussion Strategies:</p> <ul style="list-style-type: none"> • Read and Say Something • Three Minute Pause • Think-Pair-Share <p>Enrichment Activities</p> <p>Science Fair Science Olympiad</p>	<p>Benchmark Clarification</p> <p>SC.8.P.8.5: 1. Students will describe how elements combine in a multitude of ways to produce compounds that make up all living and nonliving things. 2. Students will describe the motion of particles in solids, liquids, and/or gases. 3. Students will explain that elements are grouped in the periodic table according to similarities of their properties. 4. Students will explain that atoms are the smallest unit of an element and are composed of subatomic particles. 5. Students will identify common examples of acids, bases, and/or salts. 6. Students will compare, contrast, and/or classify the properties of compounds, including acids and bases. 7. Students will differentiate among pure substances, mixtures, and solutions.</p> <p>Content Limit</p> <p>SC.8.P.8.5: 1. Items referring to elements are limited to the elements 1–57 and 72–89. 2. Items referring to subatomic particles will only assess protons, neutrons, and electrons. 3. Items will not assess chemical bonding. 4. Items may assess a conceptual understanding of the pH scale. 5. Items will not require knowledge of the pH of specific substances. 6. Items addressing the properties of acids and bases are limited to pH. 7. Items assessing mixtures and solutions may include components in different states of matter (e.g., gas dissolved in liquid). 8. Items assessing periodic trends must be at the conceptual level. 9. Items will not assess valence electrons or electron configurations.</p>
KEY TERMS (This list is not limited to all possible vocabulary within a specific unit): explore, atoms, unit, element, subatomic particles, nucleus, protons, neutrons				

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Arrangement of the periodic table	SC.8.P.8.6 (1): Recognize that elements are grouped in the periodic table according to similarities of their properties.	<p>Florida Science Fusion: www.thinkcentral.com</p> <p>Brain POP STUDY JAMS! Mc Graw Hill Glencoe CLASSZONE</p> <p>Informational Text Resources for Florida Standards</p> <ul style="list-style-type: none"> Readworks.org – non-fiction passages http://www.readworks.org/ ScienceNews for Kids https://student.societyforscience.org/sciencenews-students K12Reader http://www.k12reader.com/ 	<p>Periodic Table Activity – URL: http://science-class.net/Lessons/Chemistry/Periodic%20Table/PT_Project.pdf</p> <p> ExploreLearning Gizmos:</p> <ul style="list-style-type: none"> Element Builder Electron Configuration <p>Enrichment Activities Science Fair Science Olympiad</p>	<p>Benchmark Clarifications: SC.8.P.8.6: 1. Students will describe how elements combine in a multitude of ways to produce compounds that make up all living and nonliving things. 2. Students will describe the motion of particles in solids, liquids, and/or gases. 3. Students will explain that elements are grouped in the periodic table according to similarities of their properties. 4. Students will explain that atoms are the smallest unit of an element and are composed of subatomic particles. 5. Students will identify common examples of acids, bases, and/or salts. 6. Students will compare, contrast, and/or classify the properties of compounds, including acids and bases. 7. Students will differentiate among pure substances, mixtures, and solutions.</p> <p>Content Limit SC.8.P.8.6: 1. Items referring to elements are limited to the elements 1–57 and 72–89. 2. Items referring to subatomic particles will only assess protons, neutrons, and electrons. 3. Items will not assess chemical bonding. 4. Items may assess a conceptual understanding of the pH scale. 5. Items will not require knowledge of the pH of specific substances. 6. Items addressing the properties of acids and bases are limited to pH. 7. Items assessing mixtures and solutions may include components in different states of matter (e.g., gas dissolved in liquid). 8. Items assessing periodic trends must be at the conceptual level. 9. Items will not assess valence electrons or electron configurations.</p>
KEY TERMS (This list is not limited to all possible vocabulary within a specific unit): recognize, atoms, elements, groups, periods, periodic table, chemical properties, similarities				

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PHYSICAL SCIENCE		COURSE CODE: 2003010	
PHYSICAL SCIENCE ADVANCE		2003020	
Unit#: III	Unit Title:	Based on 18 days Total Contact Days (1 Day equals approximately 1 class period)	
Body of Knowledge: Physical Science		Pacing: 18/120 (15%)	
Standards: 10 – Forms of Energy		Schedule Type	Pacing (Days)
		Traditional	18
		Block	9
Essential Questions		Standards Notes: Nature of Science Benchmarks should be taught ALL year.	
What are waves?		The following standards below are included in the <u>Physical Science</u> Course Description, but are not (assessed) on the FCAT 2.0 Science Assessment.	
How can we describe a wave?			
What is the relationship between a various EM waves?			
How does light interact with matter?			

Essential Content	Benchmarks (DOK): Objectives and Skills www.floridastandards.org	Instructional Resources: (select benchmark specific resource)	Instruction Strategies: (recommended activities and labs)	Benchmark Clarifications / Learning goals (BC) & Content Limits (CL)
Waves	SC.7.P.10.3 (1): Recognize that light waves, sound waves, and other waves move at different speeds in different materials.	Florida Science Fusion: www.thinkcentral.com Florida Science Fusion: https://www.brainpop.com/science/energy/electromagneticspectrum/  ExploreLearning Gizmos:	Slinky Activities - http://www.nscdiscovery.org/TeacherTools/Adobe/Slinky-Waves.pdf	Benchmark Clarifications: SC.7.P.10.3: 1. Students will describe and/or explain that waves move at different speeds through different materials. 2. Students will explain that light waves can be reflected, refracted, and/or absorbed.
How Waves Transfer Energy	SC.7.N.1.1 (3): Define a problem from the seventh grade curriculum, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.	Informational Text Resources for Florida Standards NASA Electromagnetic Spectrum http://missionscience.nasa.gov/ems/01_intro.html	Enrichment Activities Science Fair Science Olympiad EPICS	Content Limits: SC.7.P.10.3: 1. Items may assess the general relative order of wave speed in different phases but will not assess the motion of the particles in the substance. 2. Items may assess pitch as related to frequency. 3. Items will not assess color as related to wavelength. 4. Items will not assess electromagnetic waves traveling in a vacuum. 5. Items will not require calculations of wave speed through different materials. 6. Items may address water waves but not in the context of water waves at the beach. 7. Items will not assess the interaction of multiple waves.
Types of Waves		<ul style="list-style-type: none"> • Sound Beats and Sine Waves • Longitudinal Waves • Ripple Tank • Herschel Experiment • Star Spectra 		
KEY TERMS (This list is not limited to all possible vocabulary within a specific unit): EM Spectrum, EM radiation, radiation, EM waves, wavelengths, infrared, visible light, ultraviolet, frequency, amplitude, trough, crest				



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Describing Waves	<p>SC.7.P.10.3 (1): Recognize that light waves, sound waves, and other waves move at different speeds in different materials.</p>	<p>Florida Science Fusion: www.thinkcentral.com  https://www.brainpop.com/science/energy/electromagneticspectrum/  ExploreLearning Gizmos: <ul style="list-style-type: none"> • Earthquake - Determination of Epicenter • Sound Beats and Sine Waves • Longitudinal Waves • Ripple Tank Concert Venue Building Materials- MEA http://www.cpalms.org/Public/PreviewResourceLesson/Preview/63170 Informational Text Resources for Florida Standards <ul style="list-style-type: none"> • Readworks.org – non-fiction passages http://www.readworks.org/ • ScienceNews for Kids https://student.societyforscience.org/sciencenews-students • K12Reader http://www.k12reader.com/ </p>	<p>Brainstorm in collaborative groups multiple types of waves movement</p> <p>Wave Simulation http://www.classzone.com/books/ml_science_share/vis_sim/wslm05_pg18_graph/wslm05_pg18_graph.html</p> <p>2-column notes on the different speed of waves movement in different materials</p> <p>Enrichment Activities Science Fair Science Olympiad EPICS</p>	<p>Benchmark Clarifications: SC.7.P.10.3: 1. Students will describe and/or explain that waves move at different speeds through different materials. 2. Students will explain that light waves can be reflected, refracted, and/or absorbed.</p> <p>Content Limits: SC.7.P.10.3: 1. Items may assess the general relative order of wave speed in different phases but will not assess the motion of the particles in the substance. 2. Items may assess pitch as related to frequency. 3. Items will not assess color as related to wavelength. 4. Items will not assess electromagnetic waves traveling in a vacuum. 5. Items will not require calculations of wave speed through different materials. 6. Items may address water waves but not in the context of water waves at the beach. 7. Items will not assess the interaction of multiple waves.</p>
<p>KEY TERMS (This list is not limited to all possible vocabulary within a specific unit): EM Spectrum, EM radiation, radiation, EM waves, wavelengths, infrared, visible light, ultraviolet, frequency, amplitude, trough, crest</p>				



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<p>Nature of Light</p> <p>Color of Light</p> <p>Parts of the EM Spectrum</p> <p>EM Radiation</p>	<p>SC.7.P.10.1 (1): Illustrate that the sun's energy arrives as radiation with a wide range of wavelengths, including infrared, visible, and ultraviolet, and that white light is made up of a spectrum of many different colors. <i>Also Assesses - SC.8.E.5.11 Identify and compare characteristics of the electromagnetic spectrum such as wavelength, frequency, use, and hazards and recognize its application to an understanding of planetary images and satellite photographs.</i></p>	<p>Florida Science Fusion: www.thinkcentral.com  http://studyjams.scholastic.com/studyjams/jams/science/energy-light-sound/light-absorb-reflect-refract.htm</p> <p>Informational Text Resources for Florida Standards Introduction to The Electromagnetic Spectrum http://missionscience.nasa.gov/ems/01_intro.html</p> <p> ExploreLearning Gizmos: Heat Absorption Herschel Experiment Radiation</p>	<p>X-rays Lesson: http://www.colorado.edu/physics/2000/index.pl</p> <p>Electromagnetic Waves: http://www.colorado.edu/physics/2000/index.pl</p> <p>EM Spectrum Project http://galileo.phys.virginia.edu/Education/outreach/8thgradesol/ElectromagSpect.htm</p> <p>Frequencies of Colors/EM Waves Activity http://imagine.gsfc.nasa.gov/docs/teachers/lessons/roygbiv/roygbiv.html</p> <p>Enrichment Activities Science Fair Science Olympiad EPICS</p>	<p>Benchmark Clarifications: SC.7.P.10.1: 1. Students will identify, compare and/or contrast the variety of types of radiation present in radiation from the Sun. 2. Students will identify and/or compare characteristics of the electromagnetic spectrum. 3. Students will identify common uses and/or applications of electromagnetic waves.</p> <p>Content Limits: SC.7.P.10.1: 1. Items may assess relative order of frequencies and wavelengths in the electromagnetic spectrum but will not require memorization of specific frequencies and wavelengths of electromagnetic radiation. 2. Items will not address hazards of electromagnetic radiation. 3. Items will address only electromagnetic waves and the electromagnetic spectrum. 4. Items will not require calculations.</p>
<p>KEY TERMS (This list is not limited to all possible vocabulary within a specific unit): light, color, EM Spectrum, EM radiation, radiation, EM waves, wavelengths, infrared, visible light, ultraviolet, frequency, amplitude, trough, crest</p>				

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<p>How Matter interacts with Light</p>	<p>SC.7.P.10.2 (3): Observe and explain that light can be reflected, refracted, and/or absorbed.</p> <p>SC.7.P.10.3: Recognize that light waves, sound waves, and other waves move at different speeds in different materials.</p>	<p>Florida Science Fusion: www.thinkcentral.com</p> <p> CPALMS Resources Refraction of Light http://www.cpalms.org/Public/PreviewResource/Preview/17208 Law of Angle of Reflection http://www.cpalms.org/Public/PreviewResource/Preview/23747</p> <p> Gizmos www.explorelearning.com ExploreLearning Gizmos:</p> <ul style="list-style-type: none"> • Radiation • Color Absorption • Heat Absorption • Basic Prism • Refraction • Ray Tracing (Lenses) • Ray Tracing (Mirrors) • Laser Reflection <p>Informational Text Resources for Florida Standards</p> <ul style="list-style-type: none"> • Readworks.org – non-fiction passages http://www.readworks.org/ • ScienceNews for Kids https://student.societyforscience.org/sciencenews-students • K12Reader http://www.k12reader.com/ 	<p>Refraction Activity http://scifiles.larc.nasa.gov/text/kids/D_Lab/activities/scattering_light.html</p> <p>Picture Inquiry – Give students images of light interacting with the environment. What do you think is happening to the light? How would you explain the different behaviors of light through different medium?</p> <p>Enrichment Activities Science Fair Science Olympiad EPICS</p>	<p>Benchmark Clarifications: (10.3): 1. Students will describe and/or explain that waves move at different speeds through different materials. 2. Students will explain that light waves can be reflected, refracted, and/or absorbed.</p> <p>Content Limits: (10.3): 1. Items may assess the general relative order of wave speed in different phases but will not assess the motion of the particles in the substance. 2. Items may assess pitch as related to frequency. 3. Items will not assess color as related to wavelength. 4. Items will not assess electromagnetic waves traveling in a vacuum. 5. Items will not require calculations of wave speed through different materials. 6. Items may address water waves but not in the context of water waves at the beach. 7. Items will not assess the interaction of multiple waves.</p>
<p>KEY TERMS (This list is not limited to all possible vocabulary within a specific unit:</p>				

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PHYSICAL SCIENCE		COURSE CODE: 2003010	
PHYSICAL SCIENCE ADVANCE		2003020	
Unit#: IV Unit Title: Energy and Heat Body of Knowledge: Physical Science Standards: 11 – Energy Transfer and Transformations	Based on 15 days Total Contact Days (1 Day equals approximately 1 class period) Pacing: 15/120 (13%)		
	Schedule Type		Pacing (Days)
	Traditional		15
	Block		7.5
Essential Questions • How is energy conserved? • How is temperature related to kinetic energy? • What is the relationship between heat and temperature?	Standards Notes: Nature of Science Benchmarks should be taught ALL year. The following standards below are included in the Physical Science Course Description, but are not (assessed) on the FCAT 2.0 Science Assessment.		
	SC.912.P.10.1: Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.		
	SC.912.P.10.4: Describe heat as the energy transferred by convection, conduction, and radiation, and explain the connection of heat to change in temperature or states of matter.		
	SC.912.P.10.5: Relate temperature to the average molecular kinetic energy.		

Essential Content	Benchmarks (DOK): Objectives and Skills www.floridastandards.org	Instructional Resources: (select benchmark specific resource)	Instruction Strategies: (recommended activities and labs)	Benchmark Clarifications / Learning goals (BC) & Content Limits (CL)
Different forms of energy	SC.7.P.11.2 (2): Investigate and describe the transformation of energy from one form to another.	Florida Science Fusion: www.thinkcentral.com	Hook/engage students using the Making Menus lesson plan.	Benchmark Clarifications: SC.7.P.11.2: 1. Students will identify and/or describe the transformation of energy from one form to another. 2. Students will differentiate between potential and kinetic energy. 3. Students will identify and/or explain situations where energy is transformed between kinetic energy and potential energy. 4. Students will identify and/or describe examples of the Law of Conservation of Energy.
Explain Law of Conservation of Energy	SC.7.P.11.3 (3): Cite evidence to explain that energy cannot be created nor destroyed, only changed from one form to another.	Brain POP https://www.brainpop.com/science/energy/	Baggie Science Activity: http://www.youth.net/cec/ceesci/ceesci.13.txt	
Energy transformation	(Assessed as SC.7.P.11.2)	CPALMS Resources The Power of Energy http://www.cpalms.org/Public/PreviewResource/Preview/28413 Informational Text Resources for Florida Standards <ul style="list-style-type: none"> Readworks.org – non-fiction passages http://www.readworks.org/ ScienceNews for Kids https://student.societyforscience.org/sciencenews-students K12Reader http://www.k12reader.com/ 	Gizmos www.explorelarning.com ExploreLearning Gizmos: <ul style="list-style-type: none"> <u>Energy Conversion</u> <u>Energy Conversion in a System</u> <u>Inclined Plane - Sliding Objects</u> Enrichment Activities Science Fair Science Olympiad	Content Limits: SC.7.P.11.2: 1. Items will not assess transformations involving nuclear energy. 2. Items may address a maximum of five energy transformations. 3. Items will not require calculations. 4. Items assessing energy transformations will not be placed in a life science context.

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KEY TERMS (This list is not limited to all possible vocabulary within a specific unit): mechanical energy, sound energy, electromagnetic energy, chemical energy, thermal energy, heat, nuclear energy, temperature, heat.

<p>Temperature</p> <p>Kinetic energy and particle motion</p> <p>Develop the concept of Temperature</p> <p>Temperature conversions: Kelvin, Celsius, and Fahrenheit scales</p> <p>Heat and Thermal Energy</p> <p>Transfer of Heat:</p> <ol style="list-style-type: none"> 1. Conduction 2. Convection 3. Radiation <p>Heat transfer, winds, and currents</p>	<p>SC.7.P.11.4 (2): Observe and describe that heat flows in predictable ways, moving from warmer objects to cooler ones until they reach the same temperature. (Also assesses SC.7.P.11.1)</p> <p>SC.7.P.11.1 (1): Recognize that adding heat to or removing heat from a system may result in a temperature change and possibly a change of state.</p>	<p>Florida Science Fusion: www.thinkcentral.com</p> <p> http://www.classzone.com/books/ml_science_share/vis_sim/mem05_pg101_kintheory/mem05_pg101_kintheory.html</p> <p> CPALMS Resources Socks and Temperature (A Heat Transfer Activity) http://www.cpalms.org/Public/PreviewResource/Preview/46119</p> <p>Informational Text Resources for Florida Standards</p> <ul style="list-style-type: none"> • Readworks.org – non-fiction passages http://www.readworks.org/ • ScienceNews for Kids https://student.societyforscience.org/sciencenews-students • K12Reader http://www.k12reader.com/ 	<p>Dancing Penny Demonstration: http://www.mcrel.org/whelmers/whelm03.asp</p> <p> ExploreLearning Gizmos:</p> <ul style="list-style-type: none"> • Phase Changes • Temperature and Particle Motion • Calorimetry Lab <p>Show this 1 minute video of a chocolate Easter bunny melting. Melting bunny video</p> <p>After viewing the video clip with the class, have students move into small groups (2 students preferred) and discuss within their group why the bunny is melting and concentrate on the flow of energy.</p> <p>Ask students to share their answers but don't correct misconceptions at this time.</p> <p>Enrichment Activities Science Fair Science Olympiad</p>	<p>Benchmark Clarifications: SC.7.P.11.4: 1. Items will not address chemical changes. 2. Items will not require calculations. 3. Items will not assess the concepts of conductors and insulators or examples of either in isolation. 4. Items will not require the use or memorization of formulas or values of specific heat, heat of fusion, or heat of vaporization for substances. 5. Items may assess the concept of specific heat.</p> <p>Content Limits: SC.7.P.11.4: 1. Items will not address chemical changes. 2. Items will not require calculations. 3. Items will not assess the concepts of conductors and insulators or examples of either in isolation. 4. Items will not require the use or memorization of formulas or values of specific heat, heat of fusion, or heat of vaporization for substances. 5. Items may assess the concept of specific heat.</p>
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KEY TERMS (This list is not limited to all possible vocabulary within a specific unit): Temperature, Kinetic energy, Kelvin, Celsius, Fahrenheit, system, change of state, particle motion, Heat, temperature, intermolecular forces, melting point, boiling point, specific heat, calorimeter, thermal equilibrium, convection, conduction

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<p>Thermal energy and heat</p> <p>Understanding the relationship between heat, temperature and thermal energy</p>	<p>SC.7.P.11.4 (2): Observe and describe that heat flows in predictable ways, moving from warmer objects to cooler ones until they reach the same temperature. <i>(Also assesses SC.7.P.11.1)</i></p> <p>SC.7.P.11.1 (1): Recognize that adding heat to or removing heat from a system may result in a temperature change and possibly a change of state.</p> <p>SC.7.N.1.1 (3): Define a problem from the seventh grade curriculum, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.</p> <p>LAFS.68.RST.1.3. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.</p>	<p>Florida Science Fusion: www.thinkcentral.com</p> <p> CPALMS Resources</p> <p>Too Hot to Handle http://www.cpalms.org/Public/PreviewResource/Preview/21857</p> <p>Frozen Treats Storage Dilemma - MEA http://www.cpalms.org/Public/PreviewResourceLesson/Preview/69758</p> <p>MIT BLOSSOMS - How Cold is Cold: What is Temperature? http://www.cpalms.org/Public/PreviewResource/Preview/19372</p> <p>Informational Text Resources for Florida Standards</p> <ul style="list-style-type: none"> • Readworks.org – non-fiction passages http://www.readworks.org/ • ScienceNews for Kids https://student.societyforscience.org/sciencenews-students • K12Reader http://www.k12reader.com/ <p> ExploreLearning Gizmos:</p> <ul style="list-style-type: none"> • Heat Transfer by Conduction • Calorimetry Lab 	<p>Testing Materials for Conductivity: http://www.infinitepower.org/pdf/09-Lesson-Plan.pdf</p> <p>Predict, Observe, Explain with PHeT virtual lab simulation.</p> <p>RACE – Have students answer the following question using the RACE method.</p> <p>Enrichment Activities</p> <p>Science Fair Science Olympiad EPICS</p>	<p>Benchmark Clarifications: SC.7.P.11.4: 1. Items will not address chemical changes. 2. Items will not require calculations. 3. Items will not assess the concepts of conductors and insulators or examples of either in isolation. 4. Items will not require the use or memorization of formulas or values of specific heat, heat of fusion, or heat of vaporization for substances. 5. Items may assess the concept of specific heat.</p> <p>Content Limits: SC.7.P.11.4: 1. Items will not address chemical changes. 2. Items will not require calculations. 3. Items will not assess the concepts of conductors and insulators or examples of either in isolation. 4. Items will not require the use or memorization of formulas or values of specific heat, heat of fusion, or heat of vaporization for substances. 5. Items may assess the concept of specific heat.</p> <p>Benchmark Clarifications: SC.7.N.1.1: 1. Students will evaluate a scientific investigation using evidence of scientific thinking and/or problem solving. 2. Students will identify test variables (independent variables) and/or outcome variables (dependent variables) in a given scientific investigation. 3. Students will interpret and/or analyze data to make predictions and/or defend conclusions. 4. Students will distinguish between an experiment and other types of scientific investigations where variables cannot be controlled. 5. Students will explain how hypotheses are valuable.</p> <p>Content Limits: SC.7.N.1.1: 1. Items addressing hypotheses will not assess whether the hypothesis is supported by data. 2. Items will not address or assess replication, repetition, or the difference between replication and repetition.</p>
<p>KEY TERMS <i>(This list is not limited to all possible vocabulary within a specific unit):</i> heat flow, temperature, change of state, thermal energy, relationship, heat, specific heat, heat of fusion, heat of vaporization</p>				

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School Board of Broward County Florida – Department of Math, Science, and Gifted

PHYSICAL SCIENCE COURSE CODE: 2003010 PHYSICAL SCIENCE ADVANCE 2003020



Unit#: V Unit Title: Energy, Motion and Forces Body of Knowledge: Physical Science Standards: 11 – Energy Transfer and Transformations; 12 – Motion of Objects; 13 – Forces and Changes in Motion	Based on 26 days Total Contact Days (<i>1 Day equals approximately 1 class period</i>) Pacing: 26/120 (22%) <table border="1" data-bbox="972 297 2030 394"> <thead> <tr> <th>Schedule Type</th><th>Pacing (Days)</th></tr> </thead> <tbody> <tr> <td>Traditional</td><td>26</td></tr> <tr> <td>Block</td><td>13</td></tr> </tbody> </table>	Schedule Type	Pacing (Days)	Traditional	26	Block	13
Schedule Type	Pacing (Days)						
Traditional	26						
Block	13						
Essential Questions <ul style="list-style-type: none"> How is mechanical energy conserved? How are distance, time, and speed related? How does motion change? What causes motion? How do objects move under the influence of gravity? 	Standards Notes: Nature of Science Benchmarks should be taught ALL year. The following standards below are included in the <u>Physical Science</u> Course Description, but are not (assessed) on the FCAT 2.0 Science Assessment. SC.912.P.10.1: Differentiate among the various forms of energy and recognize that they can be transformed from one form to others. SC.912.P.10.4: Describe heat as the energy transferred by convection, conduction, and radiation, and explain the connection of heat to change in temperature or states of matter. SC.912.P.10.5: Relate temperature to the average molecular kinetic energy.						

Essential Content	Benchmarks (DOK): Objectives and Skills www.floridastandards.org	Instructional Resources: (select benchmark specific resource)	Instruction Strategies: (recommended activities and labs)	Benchmark Clarifications / Learning goals (BC) & Content Limits (CL)
Transformations between kinetic and potential energy.	SC.7.P.11.2 (2): Investigate and describe the transformation of energy from one form to another. SC.7.P.11.3 (3): Cite evidence to explain that energy cannot be created nor destroyed, only changed from one form to another. (<i>Assessed as SC.7.P.11.2</i>) SC.6.P.11.1 (2): Explore the Law of Conservation of Energy by differentiating between potential and kinetic energy. Identify situations where kinetic energy is transformed into potential energy and vice versa. (<i>Assessed as SC.7.P.11.2</i>)	Florida Science Fusion: www.thinkcentral.com  https://www.brainpop.com/science/energy/formssofenergy/  http://www.classzone.com/books/ml_science_share/vis_sim/mem05_pg69_potential/mem05_pg69_potential.html  CPALMS Resources Potential/Kinetic Energy Simulation http://www.cpalms.org/Public/PreviewResource/Preview/410 Ready Aim Fire http://www.cpalms.org/Public/PreviewResource/Preview/124567  Gizmos www.explorelearning.com ExploreLearning Gizmos: <ul style="list-style-type: none"> Potential Energy on Shelves Roller Coaster Physics Energy of a Pendulum 	Happy/Sad balls - http://www.edufy.org/content/show/412 Roller Coaster Builder: http://www.jason.org/digital_library/4851.aspx Use content reading passages to complete the following, Main Idea – Detail Notes or Conclusion –Support Notes Enrichment Activities Science Fair Science Olympiad EPICS	Benchmark Clarifications: SC.7.P.11.2: 1. Students will identify and/or describe the transformation of energy from one form to another. 2. Students will differentiate between potential and kinetic energy. 3. Students will identify and/or explain situations where energy is transformed between kinetic energy and potential energy. 4. Students will identify and/or describe examples of the Law of Conservation of Energy. Content Limits: SC.7.P.11.2: 1. Items will not assess transformations involving nuclear energy. 2. Items may address a maximum of five energy transformations. 3. Items will not require calculations. 4. Items assessing energy transformations will not be placed in a life science context.

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KEY TERMS (This list is not limited to all possible vocabulary within a specific unit): Law of conservation of energy, energy transformation, energy conservation, energy conversion, mechanical energy, sound energy, electromagnetic energy, chemical energy, thermal energy, heat, nuclear energy

<p>Formula for average speed (avg. speed = d/t)</p> <p>Constant speed vs changing speed</p>	<p>SC.6.P.12.1 (3): Measure and graph distance versus time for an object moving at a constant speed. Interpret this relationship. (Assessed as SC.6.P.13.3)</p> <p>MA.6.A.3.6: Construct and analyze tables, graphs, and equations to describe linear functions and other simple relations using both common language and algebraic notation.</p>	<p>Florida Science Fusion: www.thinkcentral.com</p> <p> CPALMS Resources Tracking Distance Over Time http://www.cpalms.org/Public/PreviewResource/Preview/121858</p> <p> ExploreLearning Gizmos:</p> <ul style="list-style-type: none"> • Measuring Motion • Distance-Time Graphs • Distance-Time and Velocity-Time Graphs <p>Informational Text Resources for Florida Standards</p> <ul style="list-style-type: none"> • Readworks.org – non-fiction passages http://www.readworks.org/ • ScienceNews for Kids https://student.societyforscience.org/sciencenews-students • K12Reader http://www.k12reader.com/ 	<p>Motion Graphs http://www.mysciencesite.com/motion_graphs.pdf</p> <p>Domino Dash Activity – Measuring Speed http://www.science-class.net/Lessons/Physics/Force_Motion/domino_dash.pdf</p> <p>Enrichment Activities Science Fair Science Olympiad EPICS</p>	<p>Benchmark Clarifications: SC.6.P.12.1: 1. Students will interpret and/or analyze graphs of distance and time for an object</p> <p>Content Limits: SC.6.P.12.1: 1. Items requiring the interpretation and/or analysis of a graph may assess the relative speed of an object at various points or sections of the graph and the direction of motion. 2. Items will not require a comparison of the speeds of more than five different objects. 3. Items will not assess the addition of nonparallel vectors. 4. Items will not require the calculation of acceleration.</p>
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KEY TERMS (This list is not limited to all possible vocabulary within a specific unit): speed, average, constant speed, relative speed, motion, acceleration



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Changes in motion Calculate average acceleration	MA.6.A.3.6: Construct and analyze tables, graphs, and equations to describe linear functions and other simple relations using both common language and algebraic notation.	Florida Science Fusion: www.thinkcentral.com  ExploreLearning Gizmos: www.explorelearning.com Distance-Time and Velocity-Time Graphs	Acceleration Visualizations http://acme.highpoint.edu/~atitus/physlets/1Dmotion/x_t_graph.html Other Diagrams - http://acme.highpoint.edu/~atitus/physlets/1Dmotion/ Enrichment Activities Science Fair Science Olympiad EPICS	Stimulus Attribute: 1. Force diagrams may have a maximum of two sets of parallel forces acting on an object. 2. Scenarios addressing the calculation of average speed will not require the calculation of speed using data from a graph. 3. Graphs of distance and time may include no more than five constant speeds. Response Attributes: Responses will not require the creation of graphs.
KEY TERMS (<i>This list is not limited to all possible vocabulary within a specific unit</i>): motion, speed, bar graph, line graph, pie graph, force, parallel forces, distance, time, constant speed				

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<p>Different kinds of Forces</p> <p>Force diagrams</p> <p>What causes motion?</p>	<p>SC.6.P.13.1 (2): Investigate and describe types of forces including contact forces and forces acting at a distance, such as electrical, magnetic, and gravitational. <i>Also Assesses: SC.6.P.13.2 (1): Explore the Law of Gravity by recognizing that every object exerts gravitational force on every other object and that the force depends on how much mass the objects have and how far apart they are.</i></p> <p>SC.6.P.13.3 (2): Investigate and describe that an unbalanced force acting on an object changes its speed, or direction of motion, or both. <i>Also Assesses: SC.6.P.12.1 (3) Measure and graph distance versus time for an object moving at a constant speed. Interpret this relationship.</i></p> <p>MA.6.A.3.6: Construct and analyze tables, graphs, and equations to describe linear functions and other simple relations using both common language and algebraic notation.</p>	<p>Florida Science Fusion: www.thinkcentral.com</p> <p>Introduction to Forces http://www.science-class.net/Lessons/Physics/Force_Motion/forces_ws.pdf</p> <p> CPALMS Resources You've Got to Move It, Move it! http://www.cpalms.org/Public/PreviewResource/Preview/127495</p> <p> Gizmos ExploreLearning Gizmos:</p> <ul style="list-style-type: none"> • Force and Fan Carts • Fan Cart Physics • Inclined Plane – Rolling Objects • Roller Coaster Physics 	<p>Read and select a content area passage. Give students a text coding bookmark and allow them to code the text. Teacher or students create Text Dependent Questions and pass them around for students to answer in their notebook using complete sentences.</p> <p>Compare & Contrast Chart (CRISS)</p> <p>Triangular Comparison Diagram Concept Mapping</p> <p>Predict Observe Explain (Virtual Simulations)</p> <p>Enrichment Activities Science Fair Science Olympiad EPICS</p>	<p>Benchmark Clarifications: SC.6.P.13.1: 1. Students will identify and/or describe types of forces. 2. Students will describe the relationship among distance, mass, and gravitational force between any two objects. 3. Students will differentiate between mass and weight.</p> <p>Content Limits: SC.6.P.13.1: 1. Items assessing gravity will use a conceptual understanding of the Law of Universal Gravitation by keeping either the mass or distance constant. 2. Items will not assess nuclear forces. 3. Items will not require the use of formulas or calculations. 4. Items addressing mass and/or weight will not assess the units of measure for mass and weight.</p> <p>Benchmark Clarifications: SC.6.P.13.3: 1. Students will describe and/or explain that an unbalanced force acting on an object changes its speed and/or direction. 2. Students will interpret and/or analyze graphs of distance and time for an object moving at a constant speed.</p> <p>Content Limits: SC.6.P.13.3: 1. Items requiring the interpretation and/or analysis of a graph may assess the relative speed of an object at various points or sections of the graph and the direction of motion. 2. Items will not require a comparison of the speeds of more than five different objects. 3. Items will not assess the addition of nonparallel vectors. 4. Items will not require the calculation of acceleration. 5. Items may require the calculation of net force. 6. Items may assess the direction of net force. 7. Items addressing force and motion are limited to conceptual understanding. 8. Items will not require the use of the formula $F=ma$. 9. Items addressing changes in speed should use the terms <i>positive acceleration</i> and <i>negative acceleration</i>. 10. Items may assess understanding of friction as a force in both sliding and stationary situations. Items will not require knowledge of coefficient of friction. 11. Items will not imply that a calculation is required in scenarios assessing understanding of no acceleration or no net force.</p> <p>Stimulus Attributes - SC.6.P.13.3: 1. Force diagrams may have a maximum of two sets of parallel forces acting on an object. 2. Scenarios addressing the calculation of average speed will not require the calculation of speed using data from a graph. 3. Graphs of distance and time may include no more than five constant speeds.</p>
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KEY TERMS (This list is not limited to all possible vocabulary within a specific unit):

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Effect of gravity on matter	SC.6.P.13.1 (2): Investigate and describe types of forces including contact forces and forces acting at a distance, such as electrical, magnetic, and gravitational.	Florida Science Fusion: www.thinkcentral.com	Predict, Observe, Explain (POE) with Atomic Models Lesson	Benchmark Clarifications: SC.6.P.13.1: 1. Students will identify and/or describe types of forces. 2. Students will describe the relationship among distance, mass, and gravitational force between any two objects. 3. Students will differentiate between mass and weight.
Law of Universal Gravitation		Orbit simulator: Use your mouse to put a small object in Earth's orbit: http://www.colorado.edu/physics/2000/applets/satellites.html	Model Eliciting Activities (MEA)	
Orbits	SC.6.P.13.2: Explore the Law of Gravity by recognizing that every object exerts gravitational force on every other object and that the force depends on how much mass the objects have and how far apart they are. (Assessed as SC.6.P.13.1)	 CPALMS Resources Parachutes For Sale - MEA http://www.cpalms.org/Public/PreviewResourceLesson/Preview/54647 Gravitational Forces: Brick vs. Feather http://www.cpalms.org/Public/PreviewResourceLesson/Preview/77252	After watching videos infuse one of the following CRISS Discussion Strategies:	Content Limits: SC.6.P.13.1: 1. Items assessing gravity will use a conceptual understanding of the Law of Universal Gravitation by keeping either the mass or distance constant. 2. Items will not assess nuclear forces. 3. Items will not require the use of formulas or calculations. 4. Items addressing mass and/or weight will not assess the units of measure for mass and weight.
Formula: $F=mg$		 ExploreLearning Gizmos: • Gravity Pitch • Golf Range • Orbital Motion - Kepler's Laws • Solar System Explorer • Solar System • Gravitational Force • Free-Fall Laboratory Informational Text Resources for Florida Standards	• Read and Say Something • Three Minute Pause • Think-Pair-Share Enrichment Activities Science Fair Science Olympiad EPICS	

KEY TERMS (This list is not limited to all possible vocabulary within a specific unit): gravity, law of universal gravitation, orbits, force, mass, contact forces, distance, electrical force, magnetic force, weight

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Florida Standards

Each unit will incorporate Florida Standards while covering the required content. The particular core standard implemented will depend on the instructional strategy implemented.

[LAFS.68.RST.1.1](#)

[LAFS.68.RST.1.2](#)

[LAFS.68.RST.1.3](#)

[LAFS.68.RST.2.4](#)

[LAFS.68.RST.2.5](#)

[LAFS.68.RST.2.6](#)

[LAFS.68.RST.3.7](#)

[LAFS.68.RST.3.8:](#)

[LAFS.68.RST.3.9:](#)

[LAFS.68.RST.4.10:](#)

[MAFS.K12.MP.1.1](#)

[MAFS.K12.MP.2.1](#)

[MAFS.K12.MP.3.1](#)

[MAFS.K12.MP.4.1](#)

[MAFS.K12.MP.5.1](#)

[MAFS.K12.MP.6.1](#)

[MAFS.K12.MP.7.1](#)

[MAFS.K12.MP.8.1](#)

Cite specific textual evidence to support analysis of science and technical texts.

Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 68 texts and topics.

Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

Analyze the authors purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

Make sense of problems and persevere in solving them.

Reason abstractly and quantitatively.

Construct viable arguments and critique the reasoning of others.

Model with mathematics.

Use appropriate tools strategically.

Attend to precision.

Look for and make use of structure.

Look for and express regularity in repeated reasoning.