2015 – 2016

Volusia County Schools
Created For Teachers By Teachers
Committee Teachers:
Twanna Bivins
Jennifer Coll
Angela Cox
Kellie McClarty
Tai Presley

Comprehensive Science III

Curriculum Map

Regular and Advanced

Parts of the Curriculum Map

The curriculum map defines the curriculum for each course taught in Volusia County. They have been created by teachers from Volusia County Schools on curriculum mapping and assessment committees. The following list describes the various parts of each curriculum map:

- **Units:** the broadest organizational structure used to group content and concepts within the curriculum map created by teacher committees.
- **Topics:** a grouping of standards and skills that form a subset of a unit created by teacher committees.
- **Learning Targets and Skills:** the content knowledge, processes, and skills that will ensure successful mastery of the NGSSS as unpacked by teacher committees according to appropriate cognitive complexities.
- **Standards:** the Next Generation Sunshine State Standards (NGSSS) required by course descriptions posted on CPALMS by FLDOE.
- **Pacing:** recommended time frames created by teacher committees and teacher survey data within which the course should be taught in preparation for the EOC.
- **Vocabulary:** the content-specific vocabulary or phrases both teachers and students should be familiar with and use during instruction and assessment.

Some maps may also contain other helpful information, such as:

- **Resources:** a listing of available, high quality and appropriate materials (strategies, lessons, textbooks, videos and other media sources) that are aligned to the standards. These resources may be found at www.edmodo.com within the group folders. Contact the District Science Office for assistance in joining groups.
- **Teacher Hints:** a listing of considerations when planning instruction, including guidelines to content that is inside and outside the realm of the course descriptions on CPALMS in terms of state assessments.
- **Sample FOCUS Questions:** sample questions aligned to the standards and in accordance with EOC style, rigor, and complexity guidelines; they do NOT represent all the content that should be taught, but merely a sampling of it.
- **Labs:** The NSTA and the District Science Office recommend that all students experience and participate in at least one hands-on, inquiry-based, lab or activity per week where students are collecting data and drawing conclusions. The district also requires that at least one (1) lab per grading period should have a written lab report with analysis and conclusion.
- **Common Labs (CL):** Each grade level has one common Lab (CL) for each nine week period. These common labs have been designed by teachers to allow common science experiences that align to the curriculum across the district.
- **Volusia Literacy Tasks (VLT):** Each grade level has one Volusia Literacy task (VLT) for each nine week period. These literacy experiences have been designed by teachers to provide common literacy activities that align to the curriculum across the district.
- **DIAS:** (District Interim Assessments: Science) are content-specific tests developed by the district and teacher committees to assist in student progress monitoring. The goal is to prepare students for the 8th grade FCAT 2.0 or Biology EOC using rigorous items developed using the FLDOE Item Specifications Documents.

  The opening pages of the map include information about the FCAT 2.0 content breakdown, the Volusia County Science 5E Instructional Model, cognitive complexity information for developing various levels of questions for classroom use, and the Florida ELA and Math Standard that may be in the course descriptions.

Florida FCAT 2.0 Science Information

Content Breakdown by Benchmark							
Nature of Science		Earth and Space Science		Physical Science		Life Science	
19% of FCAT Science		27% of FCAT Science		27% of FCAT Science		27% of FCAT Science	
8.N.1.1 6.N.1.1 6.N.1.3 7.N.1.1 7.N.1.3 7.N.1.4 8.N.1.3 8.N.1.4 **7.N.1.2** 6.N.1.2 6.N.1.4 8.N.1.2	**7.N.1.5** 7.N.3.2 8.N.1.5 E.5.10 **6.N.2.2** 7.N.1.6 7.N.1.7 7.N.2.1 8.N.1.6 **7.N.3.1** 6.N3.1 8.N.3.2	**8.E.5.3** 8.E.5.1 8.E.5.2 **8.E.5.5** 8.E.5.6 **8.E.5.7** 8.E.5.4 8.3.5.8 **8.E.5.9** **7.E.6.2** 6.E.6.1 6.E.6.2 7.E.6.6	**7.E.6.4** 7.E.6.3 **7.E.6.5** 7.E.6.1 7.E.6.7 **6.E.7.4** 6.E.7.2 6.E.7.3 6.E.7.6 6.E.7.9 **6.E.7.5** 6.E.7.1	**8.P.8.4** 8.P.8.3 **8.P.8.5** 8.P.8.1 8.P.8.6 8.P.8.7 8.P.8.8 8.P.8.9 **8.P.9.2** 8.P.9.1 8.P.8.3 **7.P.10.1** 8.E.5.11	**7.P.10.3** 7.P.10.2 **7.P.11.2** 6.P.11.1 7.P.11.3 **7.P.11.4** 7.P.11.1 **6.P.13.1** 6.P.13.2 8.P.8.2 **8.P.13.3** 6.P.12.1	**6.L.14.1** **6.L.14.2** 6.L.14.3 **6.L.14.4** **6.L.14.5** 6.L.14.6 **6.L.15.1** **7.L.15.2** 7.L.15.1 7.L.15.3 **7.L.16.1** 7.L.16.2 7.L.16.3	**7.L.17.2** 7.L.17.1 7.L.17.3 **8.L.18.4** 8.L.18.1 8.L.18.2 8.L.18.3

Item Cognitive Complexity		
Low	Moderate	High
10-20%	60-80%	10-20%

Duration and Length		
Sessions	Total Time	Total Items
2	160 minutes	60-66

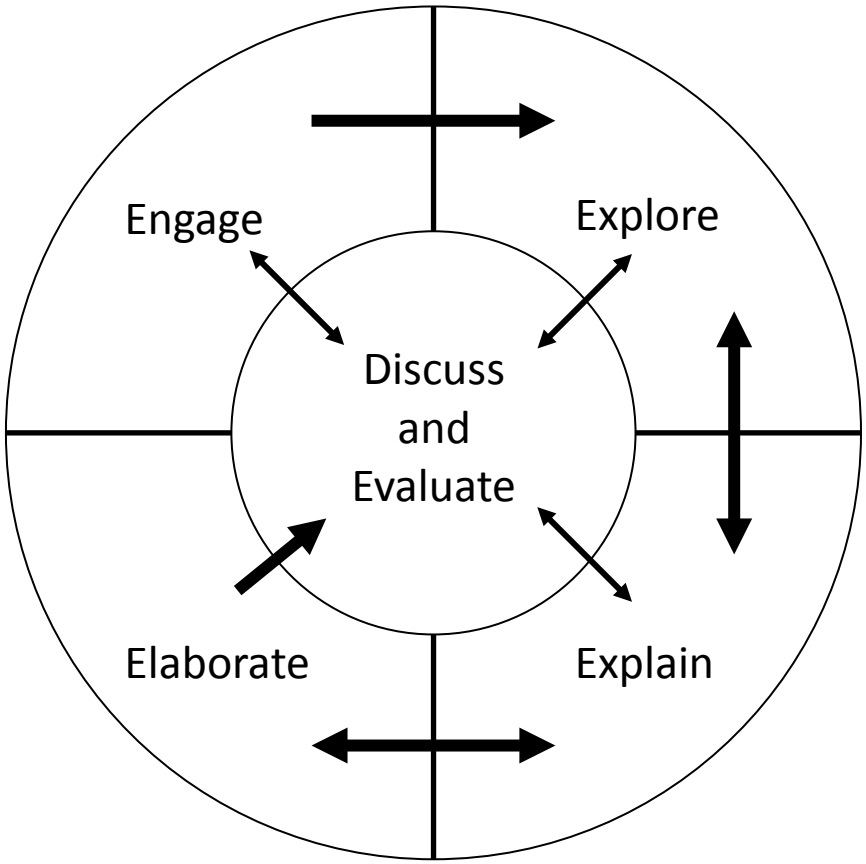
Use FCAT Explorer and Florida Achieves! For Student FCAT help and Teacher resources

Recommendations for success on the FCAT 2.0 Science:

1. Use frequent formative assessment of measurement topics.
2. Students should have access to and use FCAT Explorer and Florida Achieves!
3. Instruction should be at the same level of rigor as the learning targets in the curriculum map.

Volusia County Science 5E Instructional Model

	Description	Implementation
Engage	Learners engage with an activity that captures their attention, stimulates their thinking, and helps them access prior knowledge. A successful engagement activity will reveal existing misconceptions to the teacher and leave the learner wanting to know more about how the problem or issue relates to his/her own world. *(e.g. ISN-preview, Probe, Teacher Demonstration…)*	The diagram below shows how the elements of the 5E model are interrelated. Although the 5E model can be used in linear order (engage, explore, explain, elaborate and evaluate), the model is most effective when it is used as a cycle of learning.
Explore	Learners explore common, hands-on experiences that help them begin constructing concepts and developing skills related to the learning target. The learner will gather, organize, interpret, analyze and evaluate data. *(e.g. investigations, labs…)*	
Explain	Learners explain through analysis of their exploration so that their understanding is clarified and modified with reflective activities. Learners use science terminology to connect their explanations to the experiences they had in the engage and explore phases. *(e.g. Lecture, ISN-notes, Research, Close-reading, reading to learn, videos, websites…)*	
Elaborate	Learners elaborate and solidify their understanding of the concept and/or apply it to a real world situation resulting in a deeper understanding. Teachers facilitate activities that help the learner correct remaining misconceptions and generalize concepts in a broader context. *(e.g. labs, web-quest, presentations, debate, discussion, ISN-reflection…)*	
Evaluate	Teachers and Learners evaluate proficiency of learning targets, concepts and skills throughout the learning process. Evaluations should occur before activities, to assess prior knowledge, after activities, to assess progress, and after the completion of a unit to assess comprehension. *(i.e. formatives and summatives)*	Each lesson begins with an engagement activity, but evaluation occurs throughout the learning cycle. Teachers should adjust their instruction based on the outcome of the evaluation. In addition, teachers are encouraged to differentiate at each state to meet the needs of individual students.



*Adapted from The BSCS 5E Instructional Model: Origins, Effectiveness, and Applications, July 2006, Bybee, et.al, pp. 33-34.

Cognitive Complexity

The benchmarks in the Next **Generation Sunshine State Standards (NGSSS)** identify knowledge and skills students are expected to acquire at each grade level, with the underlying expectation that students also demonstrate critical thinking.

The categories—**low complexity**, **moderate complexity**, **high complexity**—form an ordered description of the demands a test item may make on a student. Instruction in the classroom should match, at a minimum, the complexity level of the learning target in the curriculum map.

Low	Moderate	High
This category relies heavily on the recall and recognition of previously learned concepts and principles. Items typically specify what the student is to do, which is often to carry out some procedure that can be performed mechanically. It is not left to the student to come up with an original method or solution.	This category involves more flexible thinking and choice among alternatives than low complexity items. They require a response that goes beyond the habitual, is not specified, and ordinarily has more than a single step or thought process. The student is expected to decide what to do—using formal methods of reasoning and problem-solving strategies—and to bring together skill and knowledge from various domains.	This category makes heavy demands on student thinking. Students must engage in more abstract reasoning, planning, analysis, judgment, and creative thought. The items require that the student think in an abstract and sophisticated way often involving multiple steps.
Students will: • **retrieve information** from a chart, table, diagram, or graph • **recognize** a standard scientific representation of a simple phenomenon • **complete** a familiar single-step procedure or equation using a reference sheet	Students will: • **interpret** data from a chart, table, or simple graph • **determine** the best way to organize or present data from observations, an investigation, or experiment • **describe** examples and non-examples of scientific processes or concepts • **specify** or **explain** relationships among different groups, facts, properties, or variables • **differentiate** structure and functions of different organisms or systems • **predict** or **determine** the logical next step or outcome • **apply** and **use concepts** from a standard scientific model or theory	Students will: • **analyze** data from an investigation or experiment and formulate a conclusion • **develop** a generalization from multiple data sources • **analyze** and **evaluate** an experiment with multiple variables • **analyze** an investigation or experiment to identify a flaw and propose a method for correcting it • **analyze** a problem, situation, or system and make long-term predictions • **interpret**, **explain,** or **solve** a problem involving complex spatial relationships

*Adapted from Webb's Depth of Knowledge and FLDOE FCAT 2.0 Specification Documentation, Version 2.

Middle Grades Weekly Curriculum Trace

2015	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9
6th Grade	The Nature of Science				Earth Structures and Changes			**DIAS**	Earth's Systems
7th Grade	The Nature of Science		EM Spectrum and Light	**DIAS**	Energy Temperature and Heat				**DIAS**
8th Grade	Get Ready, Get Set, GO DO SCIENCE!	**SMT 1**	Atomic Theory and Periodic Table		**DIAS**	Compounds and Mixtures			**DIAS**

2015	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18 (2016)	Week 19 (2016)
6th Grade	Earth Systems and Patterns		**DIAS**	The Sun's Energy Weather and Climate			**DIAS**	Energy, Forces, and Motion of Objects		
7th Grade	Earth Layers Plate Tectonics			**DIAS**	Rock Cycle Age of the Earth					**DIAS**
8th Grade	Properties of Matter		**DIAS**	Matter Cycles		**SMT 2**	Matter Cycles			**DIAS**

2016	Week 20	Week 21	Week 22	Week 23	Week 24	Week25	Week 26	Week 27	Week 28
6th Grade	Energy, Forces, and Motion of Objects			**DIAS**	Cell Theory, Structure, and Function				**DIAS**
7th Grade	Heredity and Reproduction Genetics				**DIAS**	Natural Selection Evidence of Evolution			
8th Grade	The Universe			**DIAS**	Solar System				**DIAS**

2015	Week 29	Week 30	Week 31	Week 32	Week 33	Week 34	Week 35	Week 36
6th Grade	Human Body Systems during **Standardized Testing**			**DIAS**	Classification			**DIAS**
7th Grade	Nat. Selec Evolution	**DIAS**	Interdependence Limiting Factors during **Standardized Testing**					**DIAS**
8th Grade	**FCAT** REVIEW		**FCAT** Administration		Transition to High School			

*DIAS (District Interim Assessments Science) are content-specific tests developed by the district and teacher committees to aid in student progress monitoring.
**Weeks 37-39 are set aside for course review and EOC administration.

The Nature of Science *Nature of Science Standards, NOS Focus, are explicitly applied in content throughout the year.		**Weeks 1 - 39**	
Topics	**Learning Targets and Skills**	**Standards**	**Vocabulary**
The Nature of Science	Students will: • **differentiate** between theories and laws • **analyze** the methods used to develop a scientific explanation • **discuss** how scientific theories are different than other theories	SC.8.N.2.2 SC.8.N.2.1 SC.8.N.4.1 SC.8.N.1.5 SC.8.N.3.1	laws non-example scientist theories
	Students will: • **differentiate** between an experiment (control group and variables) and other types of scientific investigations • **plan and carry out** various types of scientific investigations and experiments, such as: • **make** predictions or **form** a hypothesis • **differentiate** between replication and repetition • **identify** test variables (independent) and outcome variables (dependent) • **identify** control groups for each experiment • **collect and organize** data • **interpret** data • **defend** conclusions	SC.8.N.1.6 SC.8.N.1.1 SC.8.N.1.2	conclusions control group control group data differentiate experiment hypothesis inference interpret investigation observation outcome variable (dependent) prediction repetition replication senses test variable (independent) variables
	Students will: • **use phrases** such as “results support” or “fail to support” • **explain** why science does not offer conclusive “proof” of a knowledge claim • **explain how** hypotheses are valuable if they lead to further investigations, even if they turn out not to be supported by data	SC.8.N.1.3 SC.8.N.1.4	

Unit 1: Get Ready, Get Set, GO DO SCIENCE!		Weeks 1 – 2	
Topics	**Learning Targets and Skills**	**Standards**	**Vocabulary**
Get Ready	Students will: • **get to know YOU** as a scientist and WHY you LOVE science • **set up a science notebook** to be used all year long • **develop** a class list of lab safety procedures in the lab • **practice** classroom and laboratory routines and procedures		lab safety science notebook scientist
Get Set	Students will: • **describe** science as the study of the natural world • **cite examples** of science and pseudoscience (can it be tested?) • **understand** the need for a common system of measurement (metric system) among scientists • **discuss** the VARIOUS methods used by scientists to answer questions or solve problems (controlled experiments, observational studies, engineering by design, trial and error, simulations, modeling, etc.) *****Work to break the misconception that there is only 1 method used by scientists***** <u>NOS Focus: Differentiating science and pseudoscience; Methods used in science.</u>	SC.8.N.2.1 SC.8.N.2.2 SC.8.N.1.5	Science pseudoscience metric system mass volume length gram (g) liter (l) meter (m) degrees Celsius (^{0}C)
GO DO SCIENCE!	Students will: • **engage** in 1 OR MORE labs where students: ▪ form a hypothesis ▪ follow a procedure using repeated trials ▪ collect data ▪ draw a conclusion based on evidence ▪ use phrases such as "results support" or "fail to support" their hypothesis/claim (NOT PROVE OR DISPROVE) but may lead to further investigations <u>NOS Focus: Writing, testing and analyzing a hypothesis.</u>	SC.8.N.1.1 SC.8.N.1.2 SC.8.N.1.6 SC.8.N.1.3 SC.8.N.1.4	hypothesis repetition data evidence conclusion
	SMT 1	24 August – 4 September	

Get Ready, Get Set, GO DO SCIENCE! Resources		
Textbook and NOS Focus	Text pg. 1 - 21 NOS Focus – Science vs. Pseudoscience; Scientists use various methods to learn about natural world; Hypothesis- Data supports or fails to support	
Safari Montage and Videos	Steve Spangler's alka seltzer experiment clip - YouTube Making Peace With Lions - YouTube	
Websites	District Science Website – http://myvolusiaschools.org/science/Pages/default.aspx Lab Safety Manual - http://myvolusiaschools.org/science/Pages/Lab-Safety-Manual.aspx Safety Contract - http://www.nsta.org/docs/SafetyInTheScienceClassroom.pdf EDMODO- www.edmodo.com Pearson textbook - www.pearsonsuccessnet.com (instructions for login on EDMODO)	
Keeley Probes	Volume 2 #14 (Plants in the Dark) Volume 4 #9 (Magnets and Water)	
Teacher Hints & Instruction Focus	• Students need to understand that scientists do not only learn from doing investigations but also from reading non-fiction reference materials, such as, journals, newspapers, reference books etc. • Students need to know that scientists gain knowledge from many different methods and use sound scientific reasoning. • **The DOE is asking that we no longer have students memorize an artificial number of steps called the scientific method but that students learn scientific reasoning to evaluate whether something is sound or not.**	• Have students differentiate between replication and repetition and why they are important. • Teachers should continue to model limiting variables and testing a control group for comparison purposes. • Cover the importance of multiple trials and large experimental group. • Students need to understand the importance of researching a topic before forming a hypothesis or conducting an investigation. • Students need to differentiate experiment and investigation. • www.HappyScientist.com for benchmark aligned teacher demonstrations and lab ideas. (Login information may be found on EDMODO.)
Science Best Practices	Measurement processes and lab equipment should be discussed and used during a lab, not in isolation. Teachers should choose a lab that contains an independent and dependent variable, constants, and controls to complete with class during the first two weeks. **Research and data does not support front-loading vocabulary. The Nature of Science, referred to as the NOS Focus, are stated throughout the map to engage students in Activity Before Content (AbC) and Content Before Vocabulary (CbV).** There are many NOS Focus activities that can be found on EDMODO in the 8th Grade Science Nature of Science Folder.	

Common Labs (CL) and Activities	Sample FOCUS Question
Common Lab (CL) CL 1- Alka Seltzer Lab All information for this lab can be found in 8th Grade CL folder on EDMODO . This lab is recommended during the 1st or 2nd week of school to introduce and emphasize writing, testing, and analyzing a hypothesis as well as scientific thinking. **The following activities can be found on EDMODO in the Get Read, Get Set, Go Do Science Folder.** Gems of Wisdom Science Processes NOS Focus Writing, Testing, and Analyzing, a hypothesis Formative Activity Pseudoscience Means Fake Article Song Metric System	Jay and Shanna think their classmates get more schoolwork done before lunch; they suspect that eating lunch makes people less productive. They come up with a six-week-long classroom experiment to test this, which will involve some people having to eat a smaller lunch every other day. What is the FIRST thing they need to do? A. Ask for permission from the parents of their classmates. **B. Divide their class into a control group and a test group.** C. Keep their idea a secret so no one can influence the outcome. D. Tell a few people in class to help them get the outcome they want.
Prefix / Suffix	*No/Non – not* *Sciencia- wisdom* *Pre-* before *Dici- to say*	

Unit 2: Atomic Theory and Periodic Table		Weeks 3 – 6	
Topics	**Learning Targets and Skills**	**Standards**	**Vocabulary**
Atomic Theory	Students will: • **recognize** that atoms are the smallest unit of an element • **recognize** that atoms are composed of subatomic particles: o Electrons o Neutrons o Protons • **create a model or diagram** of an atom (nucleus and subatomic particles) o **discuss** the benefits and limitations of various atomic models o <u>NOS Focus- benefits and limitations of models</u> • **explain** that theories may be modified based on new evidence, but are rarely discarded (in the context of atomic theory) o <u>NOS Focus- Scientific Theories; Technology is essential to science</u>	SC.8.P.8.7 SC.7.N.3.2 SC.8.N.3.2 SC.8.E.5.10	electrons model neutrons nucleus protons subatomic particle theory technology
	Advanced: 1. Explain that electrons, protons and neutrons are parts of the atom and that the nuclei of atoms are composed of protons and neutrons, which experience forces of attraction and repulsion consistent with their charges and masses	**Advanced**: SC.912.P.8.4	
The Periodic Table of Elements	Students will: • **recognize** that elements are grouped in the periodic table according to similar properties • **predict** properties of an element using a periodic table when given information about other elements in the same column o <u>NOS Focus- Science is open to change with new evidence</u>	SC.8.P.8.6 SC.6.N.2.2	columns families groups period periodic table properties rows trend
	Advanced: 1. Use the periodic table and electron configuration to determine an element's number of valence electrons and its chemical and physical properties 2. Explain how chemical properties depend almost entirely on the configuration of the outer electron shell	**Advanced**: SC.912.P.8.5	
	Unit DIAS: Atomic Theory and Periodic Table	1 October – 2 October	

Atomic Theory and Periodic Table Resources		
Textbook and NOS Focus	Text: Pg. 260-281, 318-331; Investigations, pg. 157-159, Pg. 378-381 NOS Focus- Benefits and limitations of Scientific Models; Scientific Theories; Science is open to change with new evidence; Technology is essential to science	
Safari Montage and Videos	Safari Montage - Schlessinger Media: "Atoms and Molecules," [1:00-22:00], Schlessinger Media: 'The Periodic Table, " 23 minutes	
Websites	http://www.ptable.com/ - Interactive Periodic Table Virtual Build An Atom – Use with worksheet	
Keeley Probes	Volume 1 #10 (Is it Matter?) Volume 3 #1 (Pennies) Volume 3 #2 (Is it Solid)	
Teacher Hints & Instruction Focus	• Students need to know how particles move in solids, liquids and gases. • Items assessing subatomic particles are limited to protons, neutrons and electrons. • Items will not assess valence electrons or electron configurations or chemical bonding. • **Topics are conceptual only; students should not memorize The Periodic Table**	• Students will know how elements are grouped in the periodic table according to similar properties. • Items referring to elements are limited to the elements 1-57 and 72-89. • Students will identify how technology is essential to science. This may be explained in Atomic Theory through Rutherford's experiment. • Teachers with iPads can use the Elements 4D by DAQRI app.
Volusia Literacy Tasks (VLT)	**Volusia Literacy Task (VLT)** VLT 1 – Solving Bad Breath One Walnut at a Time Students will read the article (digital or print version) and complete the Writing Prompt VLT – 1 on the writing template. All resources can be found in the 8th grade VLT folder on EDMODO.	

Labs and Activities	Sample FOCUS Question
The following activities can be found on EDMODO in the 8th grade Atomic Theory folder: Atomic Structure Battleship (Version 1 and 2) Virtual Build an Atom (website above with worksheet) Lab Making Models of Atoms and Isotopes **The following labs and activities can be found digitally on EDMODO in the 8th Grade Science Periodic Table folder or paper copies in the Pearson LabZone Ancillaries:** Chapter Activities and Projects: Lab - Survey Properties of Metal pg. 358-364 **The following activities can be found on EDMODO in the 8th grade Periodic Table folder:** Lab Is Density A Periodic Table Trend	Using a periodic table, determine which of the following pairs of elements would have the most similar properties. A. hydrogen (H) and helium (He) **B. sodium (Na) and potassium (K)** C. nitrogen (N) and silicon (Si) D. calcium (Ca) and iron (Fe)

Prefix / Suffix	*Nuc- center Sub- under/below Proto- first Neut- neither… nor Peri- around (H)odus- journe*

Unit 3: Compounds and Mixtures		Weeks 7 – 9	
Topics	**Learning Targets and Skills**	**Standards**	**Vocabulary**
Compounds and Mixtures	Students will: • **differentiate** between atoms, elements, and compounds • **explain** how elements combine to form compounds that make up all living and non-living things, for example: o *atoms share electrons to create a bond between them*	SC.8.P.8.5	atom attraction bond compound dissolving element evaporation heterogeneous homogeneous mixtures molecule pure substance solution prediction
	Students will: • **differentiate** between pure substances, mixtures, and solutions, including: o *solutions are mixtures that may include multiple states of matter* • **investigate** different ways of making and separating mixtures and solutions, including: o *using a funnel and filter paper, a magnet, dissolving substances, screens, evaporation, etc.* o <u>NOS Focus: Making predictions; Introduction of variables</u>	SC.8.P.8.9 SC.8.N.1.1	
	Advanced: 1. Write chemical formulas for simple covalent (HCl, SO_2, CO_2, and CH_4), ionic ($Na^+ + Cl^-$ --> NaCl) and molecular (O_2, H_2O) compounds 2. Predict the formulas of ionic compounds based on the number of valence electrons and the charges on the ions	**Advanced**: SC.912.P.8.7	
Acids and Bases	Students will: • **cite** common examples of acids, bases, and salts • **Investigate to classify** various substances using the pH scale as an acid, base, or neutral o <u>NOS Focus: Replication vs repetition; Data collection and defend conclusions</u>	SC.8.P.8.8 SC.8.N.1.1 SC.8.N.1.2	acids bases pH pH Scale salts replication repetition (repeated trials)
	Advanced: 1. Use experimental data to illustrate and explain the pH scale to characterize acid and base solutions 2. Compare and contrast the strengths of various common acids and bases	**Advanced**: SC.912.P.8.11	
	Unit DIAS: Compounds and Mixtures	22 October – 23 October	

Compounds and Mixtures and Acids and Bases Resources		
Textbook and NOS Focus	Text: Pg. 390-401, 403-405, 378-379 NOS Focus: Making predictions; Introduction of variables; Replication vs repetition; Data collection and drawing conclusions	
Safari Montage and Videos	Safari Montage - Schlessinger Media: "Elements, Compounds, and Mixtures," 33 minutes	
Websites	www.TheHappyScientist.com Study Jams	
Keeley Probes	Volume 4 #1 (Sugar Water)	
Teacher Hints & Instruction Focus	• Solutions may use different states of matter, i.e. air is a solution. • Items will not assess types of bonds in terms of ionic, covalent, polar covalent, metallic, hydrogen, and van der waals.	• Students need to be able to identify common examples of acids, bases, and or salts. • This is the first time this concept is taught in middle school. • Items assessing acids and bases are limited to pH. • **Students should not memorize the specific pH value of substances**

Labs and Activities	Sample FOCUS Question
The following labs and activities can be found on EDMODO in the 8th grade Compounds and Mixtures folder: Worksheet Elements, Compounds, and Mixtures Lab Separating a Mixture Activity Mixtures and Pure Substances **The following labs and activities can be found digitally on EDMODO or paper copies in the Pearson LabZone Ancillaries:** Teacher's Lab Resource Physical Science: Lab Separating Mixtures pg. 119-123 Lab Differences in Compounds pg. 45 **The following labs and activities can be found digitally on EDMODO in the 8th grade Acids and Bases folder or paper copies in the Pearson LabZone Ancillaries:** Teacher's Lab Resource Physical Science: Lab What Color Does Litmus Turn pg. 106 Lab pHone Home pg. 116 Chapter Activities and Projects: Lab Make your own Indicator pg. 337-341 **The following labs and activities can be found on EDMODO in the 8th grade Acids and Bases folder:** The Happy Scientist- Activity Science and The Haunted Pumpkin The Happy Scientist- Robert Krampfs Color Changing Flower Lab pH Poinsettia Lab Study Jam- Acids and Bases Activity pH Scale Sort	Harriet is looking through the kitchen cabinet, trying to find something with a low pH to use in removing some calcium deposits on the kitchen sink. Which of the following things has the lowest pH and therefore would be best for her to use? A. baking soda B. bleach **C. vinegar** D. water
Prefix / Suffix	*Homo- same Hetero- different Gene- beginning*	

Unit 4: Properties of Matter		Weeks 10 – 11	
Topics	**Learning Targets and Skills**	**Standards**	**Vocabulary**
Physical Properties and Density	Students will: • **classify** substances based on their physical properties, including: o *thermal conductivity, electrical conductivity, solubility, magnetism, melting and boiling points, and density* • **investigate to explain** how the physical properties of matter are independent of the amount sampled, such as: *density and conductivity* o <u>NOS Focus – Design a controlled experiment</u> • **determine** the physical property being analyzed **given data from a table**	SC.8.P.8.4 SC.8.N.1.1	boiling point melting point degrees Celsius density electrical conductivity gas liquid magnetic properties mass matter physical properties saturation solid solubility solute solvent thermal conductivity volume weight
	Students will: • **calculate** the density of solids, liquids and gases using Density = mass ÷ volume o **measure** the mass and volume of solids, liquids and gases • **sequence** various substances in order of increasing or decreasing density • **differentiate** between mass and weight	SC.8.P.8.3 SC.8.P.8.2	
	Advanced: 1. Discuss compressibility, malleability, reactivity, and molecular composition 2. Describe simple laboratory techniques that can be used to separate homogeneous and heterogeneous mixtures (filtration, distillation, chromatography, evaporation)	**Advanced**: SC.912.P.8.2	
	Students will: • **differentiate** between solid, liquid, and gas based on their particle motion • **sequence** the states of matter by increasing or decreasing kinetic energy • **explain** how the state of matter of a substance is related to the average kinetic energy of its molecules • **predict** what happens to the motion of particles during a phase change	SC.8.P.8.1	kinetic energy phase change
	Advanced: 1. Differentiate among the four states of matter (solid, liquid, gas and plasma) in terms of energy, particle motion, and phase transitions	**Advanced**: SC.912.P.8.1	

Physical Properties and Density Resources

Textbook and NOS Focus	Text: Pg. 273, 275-276, Pg. 326 NOS Focus – Design a controlled experiment	
Safari Montage and Videos	Safari Montage - Schlessinger Media: "Properties of Matter," 23 minutes	
Websites	The Happy Scientist - conductivity Study Jams - Properties of Matter/Solid, Liquid, and Gas pHet simulation - density	
Keeley Probes	Volume 2 #2 (Floating Laws) Volume 2 #3 (Floating High and Low) Volume 2 #1 (Comparing Cubes) Volume 2 #6 (Boiling Time and Temp)	
Teacher Hints & Instruction Focus	• This is the first time this concept is taught in middle school. • This is a good opportunity to review how to design or evaluate an experiment based on scientific thinking. • Temperature will only be displayed in degrees Celsius. • Students need to know how particles move in solids, liquids, and gases. • Students may be required to calculate density, if so, the formula would be given.	• The middle school curriculum no longer includes chemical properties of matter only physical properties of matter. The textbook goes in depth in both. Do not spend time on chemical properties of matter unless your students have mastered physical properties of matter. • Items may assess the concept of saturation, conductivity, or magnetic properties but no calculations. • Students will not need to know specific melting or boiling points.

Labs and Activities

The following labs and activities can be found on EDMODO in the 8th grade Physical Properties and Density folder:
Picture Density Stacker
Notes States of Matter Energy Changes
Lab Salinity
Lab Molecular Motion
Lab Density of Candy Bars
Inquiry Lab Density of Candy Bars
The Happy Scientist - Conductivity

The following labs and activities can be found digitally on EDMODO in the 8th grade Physical Properties and Density folder or paper copies in the Pearson LabZone Ancillaries:
Teacher's Lab Resource Physical Science: Lab Copper or Carbon pg. 85-92
Lab Making Sense of Density pg. 65-73
Lab What are solids, liquids, gases pg. 47
Lab Sublimation pg. 62
Chapter Activities and Projects: Activity Build a Density Calculator pg. 365-371
Scenario-Based Investigations: Lab What a mass pg. 157-159

Sample FOCUS Question

Sam is trying to convince Alan that a substance that conducts heat does not necessarily conduct electricity as well. Which of the following would be the best example for him to use to convince Alan of this?

A. a piece of glass
B. a piece of copper wire
C. a steel nail
D. a paper clip

Prefix / Suffix	*Homo- same Hetero- different Gene- beginning Solvere- to dissolve Satur- full*

Unit 4: Properties of Matter		Weeks 12 – 13	
Topics	**Learning Targets and Skills**	**Standards**	**Vocabulary**
Chemical Changes	Students will: • **differentiate** physical and chemical changes in matter • **cite examples** of physical and chemical changes in matter • **investigate** physical and chemical changes in matter o NOS Focus – Inferences and Observations	SC.8.P.9.2 SC.8.N.1.1 SC.8.N.1.6	chemical change physical change inference observation interpret
	Students will: • **explain** how temperature influences chemical changes o NOS Focus – Independent and Dependent Variables and Control Groups	SC. 8.P.9.3 SC.8.N.1.1 SC7.N.1.4	Temperature Independent variable (test) Dependent variable (outcome) Control groups
	Students will: • **explain** why mass is conserved when substances undergo physical and chemical changes according to the Law of Conservation of Mass o **differentiate** between a law and a theory o NOS Focus- Theory vs. Law • **investigate** the law of conservation of mass using models, such as: o *chemical equations, experiments, and demonstrations* • **design an investigation** to explore the Law of Conservation of Mass o NOS Focus – Hypothesis, Collect and Analyze Data, Draw Conclusions, and Experimental Error ***STEM Lab #1 will be completed during Week 14***	SC.8.P.9.1 SC.7.N.3.1 SC.8.N.1.1	Law of Conservation of Mass Scientific Law Scientific Theory Experimental Error
	Unit DIAS: Properties of Matter	19 November – 20 November	

Chemical Changes Resources	
Textbook and NOS Focus	Text: Pg. 271, 298, 302-305, 418-421, 425 NOS Focus – Inferences and Observations; Independent and Dependent Variables and Control Groups; Hypothesis, Collect and Anaylze Data, Draw Conclusions, and Experimental Error; Theory vs. Law
Safari Montage and Videos	Safari Montage - Schlessinger Media: "Heat and Chemical Energy," 23 minutes
Websites	Study Jams – Physical and Chemical Changes of Matter Happy Scientist – Making Butter Physical and Chemical Changes - YouTube
Keeley Probes	Volume 1 #13 (Rusty Nail) Volume 2 #7 (Freezing Ice) Volume 4 #2 (Iron)
Teacher Hints & Instruction Focus	• This is the first time this concept is taught in middle school. • Students will not be assessed on balancing chemical equations. • The Law of Conservation of Mass will not require mathematical computations.
STEM Lab	STEM Lab #1 will be completed during week 14. All STEM Lab resources will be found in the "8th grade science STEM Lab" folder.

Labs and Activities	Sample FOCUS Question
The following labs and activities can be found on EDMODO in the 8th grade Chemical Changes folder: Worksheet Physical vs Chemical Changes Lab Rates of Reactions Rocket Lab Lab Rates of Reaction Lab Precipitates Lab Endo Exo Lab Elephant Toothpaste Activity Physical and Chemical Change Card Sort **The following labs and activities can be found digitally on EDMODO in the 8th grade Chemical Changes folder or paper copies in the Pearson LabZone Ancillaries:** Teacher's Lab Resource Physical Science: Lab Physical\Chemical Changes pg. 77 QuickLab Did you Lose Anything pg. 144 QuickLab Is Matter Conserved pg. 146 Chapter Activities and Projects: QuickLab A Story of Changes in Matter pg. 372-378	Hilary put some ice cubes in a glass of water, and the ice cubes melted. What is the best evidence she can use to show that the melting of the ice is a purely physical change and not a chemical change? A. Even though the ice and the liquid water look different, they can be shown to be made of the same molecules. **B. When liquid water is put into the freezer and cooled long enough, it will change into a solid form.** C. She did not need to add any extra heat in order to get the ice to melt in the glass of water. D. Although ice is more difficult to see through than liquid water, it does not change color when it melts

Prefix/Suffix	

Unit 5: Matter Cycles		Weeks 15 – 16	
Topics	**Learning Targets and Skills**	**Standards**	**Vocabulary**
Photosynthesis and Cellular Respiration	Students will: • **describe** the process of photosynthesis using word equations: o carbon dioxide + water + sunlight —> sugar (food) + oxygen + water • **describe** the role of light, carbon dioxide and water in photosynthesis • **describe** the role of chlorophyll in the process of photosynthesis • **differentiate** which organisms undergo photosynthesis o <u>NOS Focus- Making predictions and using evidence to draw conclusions</u>	SC.8.L.18.1 SC.8.N.1.6	chlorophyll chloroplasts organism photosynthesis
	Students will: • **describe** the process of cellular respiration using word equations: o oxygen + sugar (food) —— > carbon dioxide + water • **explain** how cellular respiration breaks down food to provide energy and releases carbon dioxide • **explain** why plants and animals undergo cellular respiration	SC.8.L.18.2	cellular respiration mitochondria
	Advanced: 1. Identify the reactants, products, and basic functions of photosynthesis 2. Identify the reactants, products, and basic functions of aerobic and anaerobic cellular respiration 3. Explain the interrelated nature of photosynthesis and cellular respiration	**Advanced**: SC.912.L.18.7 SC.912.L.18.8 SC.912.L.18.9	

Photosynthesis and Cellular Respiration Resources	
Textbook and NOS Focus	Text: Chapter 13.1, 13.2 NOS Focus- Making predictions and using evidence to draw conclusions.
Safari Montage and Videos	Safari Montage - "Photosynthesis," 23 minutes, "Respiration" – Bill Nye [10:10, 16:10, 17:30]
Websites	The Happy Scientist – Cellular Respiration The Happy Scientist - Photosynthesis
Keeley Probes	Volume 1 #20 (Functions of Living Things)
Teacher Hints & Instruction Focus	• This is the first time this concept is taught in middle school. • Items will not assess anaerobic respiration. • Items will not use the form ATP. • Items will not use term reactant. • Students should not memorize the full formulas for these processes but should know the products and reactants as words. • **SMT 2 will be administered during week 17.**
Volusia Literacy Tasks (VLT)	**Volusia Literacy Task (VLT)** VLT 2 – Changes In Leaf Color Students will read the article (digital or print version) and complete the Writing Prompt VLT 2 on the writing template. All resources can be found in the 8th grade VLT folder on EDMODO.

Labs and Activities	Sample FOCUS Question
The following labs and activities can be found on EDMODO in the 8th grade Photosynthesis and Cellular Respiration folder: Writing Activity Photosynthesis Acrostic Lab Respiration In Yeast Lab Photosynthesis and Cellular Respiration Lab Looking at Pigment Jeopardy Cycles of Nature Cellular Respiration and Photosynthesis Content Statements Photosynthesis Cell Respiration Review Formative Activity Photosynthesis Comic Strip Activity Photosynthesis Cell Cards Activity Photosynthesis and Respiration **The following labs and activities can be found digitally on EDMODO in the 8th grade Photosynthesis and Cellular Respiration folder or paper copies in the Pearson LabZone Ancillaries:** Teacher's Lab Resource Life Science: Lab Energy from Sun pg. 291 Lab Exhaling carbon dioxide pg. 295-302 Chapter Activities and Projects: Lab Shine On pg. 64-70	Which of the following best explains what happens to most of the heat generated when food molecules are broken down in the body during cellular respiration? **A. It is released to the surrounding environment.** B. It is used to power the body's processes. C. It is destroyed as it is used by the body for fuel. D. It is converted into fat and stored for later use.

Prefix / Suffix	*Photo- light Synth- to make Chloro- green Phylon- plant Plast- shape Respirare- breath Mitos- thread Khondros- grain Con- with Servare- to keep Sed- to sit*

Unit 5: Matter Cycles		Weeks 17 – 19	
Topics	**Learning Targets and Skills**	**Standards**	**Vocabulary**
Conservation of Matter and Energy	Students will: • **investigate** how living systems obey the Law of Conservation of Mass o NOS Focus – Design a controlled Experiment • **investigate** how living systems obey the Law of Conservation of Energy o NOS Focus – Interpreting data and developing a hypothesis	SC.8.L.18.4	Law of Conservation of Energy Law of Conservation of Mass
	Students will: • **explain** how matter and energy are transferred in the carbon cycle • **construct a scientific model** of the carbon cycle o NOS Focus- Discuss benefits and limitations of models • **identify** carbon reservoirs as the atmosphere, organisms, fossil fuels, sediments and oceans and other bodies of water	SC.8.L.18.3 SC.7.N.3.2	biomass carbon cycle carbon reservoirs environment fossil fuels sediments
	Unit DIAS: Matter Cycles	14 January – 15 January	

Conservation of Matter and Energy Resources	
Textbook and NOS Focus	Text: Chapter 13.3 (not the nitrogen cycle) NOS Focus- Design a controlled experiments; Interpreting data and developing a hypothesis; Limitations and benefits of scientific models
Safari Montage and Videos	Safari Montage - "The Transfer of Energy," 24 minutes
Websites	Study Jam – The Carbon Cycle
Keeley Probes	Volume 1 #8 (Seedlings in a Jar) Volume 3 #19 (Earth's Mass)
Teacher Hints & Instruction Focus	• Items referring to the carbon cycle may include carbon reservoirs, such as the atmosphere, organisms, fossil fuels, sediments, and oceans/water.
Common Labs (CL)	**Common Lab (CL)** CL 2 – Law of Conservation of Mass All information for this lab can be found in 8th Grade CL folder on EDMODO . This lab is recommended during the Conservation of Matter and Energy Unit. CL 2 gives students the opportunity to experience the Law of Conservation of Mass.

Labs and Activities	Sample FOCUS Question
The following labs and activities can be found on EDMODO in the 8th grade Conservation of Matter and Energy folder: Gems of Wisdom Matter Cycle (Version 1 and Version 2) Worksheet water carbon and oxygen cycle notes Powerpoint matter cycles photosynthesis and cellular respiration Notes cycles powerpoint Poster Project Carbon Cycle Matter cycles exit slip questions Lab reactions Law of Conservation Lab carbon cycle dinosaur breath Game Carbon Cycle **The following labs and activities can be found digitally on EDMODO in the 8th grade Conservation of Matter and Energy folder or paper copies in the Pearson LabZone Ancillaries:** Teacher's Lab Resource Life Science: Activity Model Carbon Cycle pg. 306 Activity Conservation in Living Systems pg. 307 Chapter Activities and Projects: Activity Design and Build A Closed Reaction Chamber pg. 351	The average person eats tons of food during their life, yet an adult only weighs, at most, a few hundred pounds. Which answer best explains what happens to all of that food? A. Some is used to build body structures, and some disappears while being transported. **B. Some is used for growth, some may be stored, and some is excreted as waste.** C. Some is used for energy for the body, some may be stored, and some disappears. D. Some evaporates during the digestion process, and some gets used by the body
Prefix / Suffix	*Photo- light* *Synth- to make* *Chloro- green* *Phylon- plant* *Plast- shape* *Respirare- breath* *Mitos- thread* *Khondros- grain* *Con- with* *Servare- to keep* *Sed- to sit*	

Unit 6: Scale of The Universe and Gravity		Weeks 20 – 22	
Topics	**Learning Targets and Skills**	**Standards**	**Vocabulary**
Electromagnetic Spectrum	Students will: • **identify** the electromagnetic waves from the Sun, such as: o *infrared, visible light and ultraviolet* • **sequence** the order of frequencies and wavelengths in the electromagnetic spectrum *(radio to gamma)* • **identify** common uses and applications of electromagnetic waves*, such as:* o *satellite photographs, microscopes, laser devices, etc.* • **discuss** the importance of technology in studying various aspects of space	SC.8.E.5.11 SC.8.E.5.10	Electromagnetic spectrum Electromagnetic waves / radiation visible light frequency infrared light ultraviolet light satellite photographs wavelength
Scale of the Universe and Gravity	Students will: • **distinguish** the hierarchical relationships between planets, stars, moons, asteroids, nebulae, galaxies, dwarf planets and comets in the universe by comparing distance, relative size, and general composition	SC.8.E.5.3	relative size relative distance composition astronomical bodies
	Students will: • **describe** the distances (*in astronomical units and light years*) between objects in space in the context of light and space travel	SC.8.E.5.1	light years astronomical units (AU)
	Students will: • **recognize** that the universe contains billions of galaxies and stars	SC.8.E.5.2	universe space
	Students will: • **describe** the role gravity plays in the formation of planets, stars, and the solar system (Law of Universal Gravitation) • **differentiate** between weight and mass, such as: o *weight is the amount of gravitational pull on an object and is distinct from, though proportional to, mass* • **apply** the Law of Universal Gravitation to objects in space in terms of orbital path, weight, speed, etc. o <u>NOS Focus- Scientific Processes with observations and inferences</u>	SC.8.E.5.4 SC.8.P.8.2 SC.8.N.1.1	gravity weight mass gravitational pull force

EM Spectrum and The Scale of The Universe and Gravity Resources

Textbook and NOS Focus	Text: Pg. 232-239, Pg. 94-97, 98-103, 116-121, 162-167 NOS Focus- Scientific Processes with observations and inferences.
Safari Montage and Videos	EM Spectrum - YouTube Star Size Comparison – YouTube
Websites	Gravity Force Lab - https://phet.colorado.edu/en/simulation/gravity-force-lab
Keeley Probes	Volume 1 #3 (Birthday Candles), Volume 1 #13 (Gravity) Volume 4 #8 (Standing on a Foot)
Teacher Hints & Instruction Focus	• Items will not address hazards of electromagnetic radiation. • Energy and the electromagnetic spectrum are conceptual only. • The formula for the Law of Universal Gravitation or the gravitational constant is not required. • Students should not memorize quantitative astronomical data. • Items will not assess the relative distance of objects in our solar system from the Sun. • Students do not need to know chemical composition of solar bodies. • Items assessing astronomical bodies are limited to planets, stars, moons, asteroids, nebulae, galaxies, dwarf planets, and comets. • Items will not require calculations but may require comparison or use of quantitative data including tables. • Items addressing mass or weight will not assess units of measure of mass and weight.

Labs and Activities

The following labs and activities can be found on EDMODO in the 8th grade The Electromagnetic Spectrum folder:

Gems of Wisdom 8th grade Universe
Electromagnetic Content Statements (Version 1 and 2)
Electromagnetic Spectrum Powerpoint

The following labs and activities can be found digitally on EDMODO in the 8th grade EM Spectrum folder or paper copies in the Pearson LabZone Ancillaries:

Teacher's Lab Resource Physical Science: Lab How Fast Are EM Waves pg. 150
Lab What is an EM Wave Made Of pg. 151 Lab Parts of the Electromagnetic Spectrum," pg. 153
Lab Differences Between Waves pg. 152

The following labs and activities can be found on EDMODO in the 8th grade The Scale of The Universe and Gravity folder:

Gems of Wisdom The Universe and Gravity
Content Statements The Scale of the Universe and Gravity
Powerpoint Distance and Gravity in the Universe
Powerpoint Gravity in The Solar System
Lab Gravity Exploration
Worksheet Mass vs Weight
Lab Gravity with Graph on Back
Lab What Factors Affect Gravity
Gravity Force Lab

The following labs and activities can be found digitally on EDMODO in the 8th grade The Scale of the Universe and Gravity folder or paper copies in the Pearson LabZone Ancillaries:

Teacher's Lab Resource Earth/Space Science: Lab How far is that Star pg. 48-49
Activity How Big Is Earth pg. 74 Lab Measuring The Universe pg. 49

Common Lab (CL)

Common Lab (CL)

CL 3 – What's Doing The Pulling?

All information for this lab can be found in 8th Grade CL folder on EDMODO .

This lab is recommended during the Scale of the Universe and Gravity Unit. CL 3 allows students to experience the affects of gravity on objects of various masses.

Sample FOCUS Question

One type of light that comes from the Sun is called infrared. Human eyes can't see this type of light, but specially built cameras can. Why can't human eyes detect infrared light?

A. The energy of infrared light is too high for our eyes to detect.
B. The wavelength of infrared light is too long for our eyes to detect.
C. Infrared light is too fast for our eyes to detect.
D. The Sun does not give off enough infrared light for our eyes to detect.

Prefix / Suffix	*Infra- below Ultra- beyond Astro- star Nomos- arrange Planetia- wonderer -oid- "-like" Uni- one Verse- voice Gravis- heavy*

Unit 6: The Scale of The Universe and Gravity		Weeks 23 – 24	
Topics	**Learning Targets and Skills**	**Standards**	**Vocabulary**
The Stars and Our Sun	Students will: • **describe** the physical properties of main sequence stars, including: o *apparent brightness (magnitude), temperature (color), size, and absolute brightness (magnitude)* • **understand** how technology is essential to science for such purposes as access to outer space and other remote locations, sample collections, measurement, data collection and storage, computation, and communication of information.	SC.8.E.5.5 SC.8.E.5.10	absolute brightness apparent magnitude physical properties temperature
	Students will: • **describe** the properties and characteristics of the Sun, including: o *rotation, structure, convection, sunspots, solar flares, and prominences* • **create** models of various solar phenomena o NOS Focus- identify the benefits and limitations of the use of scientific models	SC.8.E.5.6 SC.8.N.3.1 SC.7.N.3.2	convection rotation solar flares solar prominences solar properties sun sunspots
	Advanced: 1. Describe the physical properties of the Sun (sunspot cycles, solar flares, prominences, layers of the Sun, coronal mass ejections, and nuclear reactions) and the impact of the Sun as the main source of external energy for the Earth	**Advanced**: SC.912.E.5.4	
	Unit DIAS: Universe and Gravity	18 February – 19 February	

<table>
<tr><th colspan="3">The Stars and Our Sun Resources</th></tr>
<tr><td>Textbook and NOS Focus</td><td colspan="2">Text: Pg. 110-115, 122-127
NOS Focus- Technology to study outer space; Benefits and limitations of scientific models</td></tr>
<tr><td>Safari Montage and Videos</td><td colspan="2">Safari Montage - “Planets and Solar System,” 24 minutes.</td></tr>
<tr><td>Websites</td><td colspan="2">www.nasa.gov</td></tr>
<tr><td>Keeley Probes</td><td colspan="2">Volume 4 #23 (Moonlight)</td></tr>
<tr><td>Teacher Hints & Instruction Focus</td><td>• This is the first time this concept is taught in middle school.
• Items will not assess the stages of stellar evolution.
• Students will not need to know specific chemical composition of the stars.
• Stellar distance will be given in AU or light years.
• Items will focus on main sequence stars and their properties.</td><td>• Absolute brightness should be used instead of absolute luminosity.
• Models may be 2D, 3D, computer generated, diagrams etc.
• Interpret models of solar properties including rotation, structure, convection, sunspots, solar flares and prominences. Students on FCAT will not be able to create a model of solar properties but they will be expected to evaluate models that they are given and explain their solar characteristics.</td></tr>
<tr><th colspan="2">Labs and Activities</th><th>Sample FOCUS Question</th></tr>
<tr><td colspan="2">The following labs and activities can be found on EDMODO in the 8th grade The Scale of The Stars and Our Sun folder:
Powerpoint Stars and Sun

The following labs and activities can be found digitally on EDMODO in the 8th grade The Stars and Our Sun folder or paper copies in the Pearson LabZone Ancillaries:

Teacher’s Lab Resource Earth/Space Science:
Lab How do Stars Differ pg. 57
Lab HR Diagrams Pg. 67
Lab What Determines How Long Stars Live pg. 68
Lab Viewing Sunspots pg. 73

From Student Textbook
Apply It- Spectrum Analysis, Pg. 112</td><td>Sunspots are dark regions on the visible surface of the Sun. Which of the following is responsible for sunspots?

A. fusion reactions in the Sun
B. gravitational force between Earth and the Sun
C. the Sun's magnetic field
D. solar flares</td></tr>
<tr><td>Prefix / Suffix</td><td colspan="2">Ab- from/not Solvere- dissolve Sol- sun Rota- turn Vect- to carry Orb- sphere Atmos- gas Geo- earth Helio- sun Centric- centered</td></tr>
</table>

Unit 7: The Solar System		Weeks 25 – 26	
Topics	**Learning Targets and Skills**	**Standards**	**Vocabulary**
The Solar System	Students will: • **differentiate** between the various historical models of the solar system, including geocentric and heliocentric o <u>NOS Focus- theories may be modified but are rarely discarded</u> • **create a model** of the solar system o <u>NOS Focus-using models to make sense of the collected evidence</u> o <u>NOS Focus- scientific knowledge changes with new evidence</u>	SC.8.E.5.8 SC.8.N.3.2 SC.8.N.1.6 SC.7.N.2.1	geocentric heliocentric
	Students will: • **differentiate** between characteristics of objects in the solar system (including the sun, planets and their moons) with Earth in terms of: o *gravitational force, distance from the Sun, speed, movement, orbital path, temperature, and atmospheric conditions* • **explain** how surface temperature and length of year of a planet are related to the distance from the sun • **compare** the atmospheres of the planets to the atmosphere of Earth in terms of surface temperature, including: o *presence, absence, or relative thickness*	SC.8.E.5.7	Atmospheric conditions Earth gravitational force moon motion orbital path planets solar system speed

The Solar System Resources	
Textbook and NOS Focus	Text: Pg. 70-71, 104-107, 138-139, 143-163, 168-172 NOS Focus- Modification of theories , Collection of scientific evidence, Science changes with evidence
Safari Montage and Videos	Safari Montage - "Renaissance Science & Investigation: Geo vs. Helio" [6:30-11:10]
Websites	www.nasa.gov
Keeley Probes	Volume 4 #22 (Where would it Fall)
Teacher Hints & Instruction Focus	• This is the first time this concept is taught in middle school. • Items will not assess the chemical composition of the atmospheres. • Items will not assess the order of the planets in the Solar System in isolation but that knowledge may help them answer a conceptual question about how their characteristics are different from Earth.
Volusia Literacy Tasks (VLT)	**Volusia Literacy Task (VLT)** VLT 3- Urine May Make Mars Travel Possible Students will read the article (digital or print version) and complete the Writing Prompt VLT 3 on the writing template. All resources can be found in the 8th grade VLT folder on EDMODO.

Labs and Activities	Sample FOCUS Question
The following labs and activities can be found on EDMODO in the 8th grade The Solar System folder: Gems of Wisdom The Solar System (Version 1 and 2) Powerpoint Eclipses ADI Planets in the Star System and DATA for the ADI Activity Pocket Solar System **The following labs and activities can be found digitally on EDMODO in the 8th grade The Solar System folder or paper copies in the Pearson LabZone Ancillaries:** Teacher's Lab Resource Earth/Space Science: Lab Speeding Around The Sun pg. 75-83 Activity Clumping Planets pg. 84 Activity Characteristics of Inner Planets pg. 88 Activity How Big Are The Planets pg. 90 Activity Density Mystery pg.91 Activity Going Around In Circles pg. 96 Chapter Activities and Projects: Activity Space Exploration Vehicle pg. 316-322 Activity Build a Model of the Solar System pg. 323-329 Interdisciplinary Activities (Math/Reading): Activity Journey to Mars pg. 42-49	Saturn is 9.5 astronomical units (AU) from the Sun and Mars is only 1.5 AU from the Sun. Saturn is also much larger than Mars. Based on this information, how does the average surface temperature on Mars compare to the average surface temperature on Saturn? **A. Since Mars is closer to the Sun than Saturn, it has a higher average surface temperature.** B. Saturn is larger than Mars and absorbs more light, so it has a higher average surface temperature. C. Since both planets are more than 1 AU from the Sun, their average surface temperatures are equal. D. Even though Saturn is further away, Saturn's rings cause it to have a lower average surface temperature
Prefix / Suffix	*Ab- from/not Solvere- dissolve Sol- sun Rota- turn Vect- to carry Orb- sphere Atmos- gas Geo- earth Helio- sun Centric- centered*	

Unit 7: The Solar System		Weeks 27 – 29	
Topics	**Learning Targets and Skills**	**Standards**	**Vocabulary**
Relationships between Sun, Moon, and Earth	Students will: o **demonstrate** the effects of Earth's rotation and revolution in relationship to the sun, such as: o *day and night vs. length of a year* • **diagram to explain** how Earth's tilted axis and its revolution around the Sun produces seasons • **explain** how the Earth stays in orbit because of its inertia and the gravitational pull of the sun	SC.8.E.5.9.1	rotation revolution day / night year axis seasons gravitational attraction inertia
	Students will: • **demonstrate to explain** how the phases of the moon are created • **explain** how the tides are the result of the pull of gravity by the Sun and Moon. • **differentiate** between solar and lunar eclipses	SC.8.E.5.9.2	moon phases tides solar eclipses lunar eclipses
	Students will: o **discuss** the effects of space exploration on the economy and culture of Florida o **explain** how political, social, and economic concerns can affect science, and vice versa at the levels of community, state, national, and international levels	SC.8.E.5.12 SC.8.N.4.2 SC.8.N.4.1	
	Unit DIAS: Solar System	30 March – 1 April	

<table>
<tr><th colspan="3">Sun, Moon, and Earth Resources</th></tr>
<tr><td>Textbook and NOS Focus</td><td colspan="2">Text: Pg. 105, 182-189, 190-199</td></tr>
<tr><td>Safari Montage and Videos</td><td colspan="2"></td></tr>
<tr><td>Websites</td><td colspan="2"></td></tr>
<tr><td>Keeley Probes</td><td colspan="2">Volume 1 #25 (Going through a Phase) Volume 3 #23 (Summer Talk) Volume 4 #24 (Lunar Eclipse) Volume 4 #25 (Solar Eclipse)</td></tr>
<tr><td>Teacher Hints & Instruction Focus</td><td colspan="2">• Items on eclipses will not assess umbra or penumbra.</td></tr>
<tr><td colspan="2"></td><td>Sample FOCUS Question</td></tr>
<tr><td colspan="2">The following labs and activities can be found digitally on EDMODO in the 8th grade Sun, Moon, and Earth folder or paper copies in the Pearson LabZone Ancillaries:
Scenerio-Based Investigations: Activity Smearing causes Seasons pg. 133-135
Teacher’s Lab Resource Earth/Space Science:
Lab What Causes Day and Night pg. 98
Lab Reasons For The Seasons pg. 100-108
Lab Moon Phases and Eclipses pg. 110-111
Lab When Is High Tide pg. 112
Lab Moon’s Pull Of Gravity pg. 113
Lab Space Jobs pg. 146
Chapter Activities and Projects: Activity Track The Moon pg. 309-315</td><td>Which of the following statements correctly explains why we experience seasons?
A. As the Earth moves away from the Sun, we change from summer to fall to winter. As the Earth moves closer to the Sun, we change from winter to spring to summer.
B. As the Earth spins on its axis, we experience seasons. Each 1/4 spin of the Earth on its axis represents a change in season.
C. Earth's tilt on its axis means one hemisphere leans toward the Sun, causing it to experience warmer temperatures. As Earth revolves around the Sun, a different hemisphere leans toward the Sun, causes warmer temperatures in that hemisphere.
D. The Moon moving in front of the Sun causes temperatures on Earth to drop, which causes winter. When it moves behind the Sun, a rise in temperature causes summer.</td></tr>
<tr><td>Prefix / Suffix</td><td colspan="2">Rota- turn in place Rev- turn around Gravis- heavy Ad/at- towards Tract- to pull Sol-sun Luna- moon</td></tr>
</table>

FCAT REVIEW and ADMINSTRATION	
FCAT Review	Review for FCAT 2.0
FCAT Administration	Administer FCAT 2.0

Unit 8: Transition to High School/STEM/School Science Fair		After testing – Week 39	
Topics	**Learning Targets and Skills**	**Standards**	**Vocabulary**
Bridge to Earth Science (Regular)	Students will: • **describe** the processes of weathering, erosion, and deposition • **explain** how those processes impact current surface features and create new ones • **relate** weathering, erosion, and deposition to the rock cycle, *i.e. compaction of deposited material leading to sedimentary rock*	SC.6.E.6.1 SC.7.E.6.2	Weathering Erosion Deposition Rock cycle
	Students will: • **describe** how a fossil is formed • **relate** fossil formation to a time period based on fossil characteristics • **investigate** floral and faunal succession through stratigraphy • **explain** how the theory of evolution is supported by the fossil record, biogeography, and observed evolutionary change	SC.7.L.15.1	Evolution Fossil Biogeography Stratigraphy Faunal succession
Bridge to Biology (Advanced)	Students will: • **describe** how organisms are classified using evolutionary relationships • **classify** the three domains using distinguishing characteristics: o (*Archea, Bacteria, and Eukarya)* • **classify** the six kingdoms using distinguishing characteristics: o *(Archea, Eubacteria , Protista, Fungi, Plantae, and Animalia)* • **distinguish** whether organisms are: o prokaryotic vs. eukaryotic and unicellular vs. multi-cellular o autotrophs vs. heterotrophs	SC.6.L.15.1	Taxonomy Classification Hierarchy Binomial Nomenclature Autotroph Heterotroph
	Students will: • **predict** the impact of individuals on the environment and sustainability • **discuss** the need to monitoring environmental factors when making policy decisions • **evaluate** the possible environmental costs and benefits of using renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests	SC.7.L.17.3 SC.7.E.6.6	Non-/Renewable resources Fossil fuels Pollution / Smog Acid Rain Global warming Sustainability

Transition to High School Resources		
Textbook		
Safari Montage and Videos	YouTube- See any of the Biology by Crash Course (PREVIEW all videos first) YouTube- See any of the Bozeman Biology	
Websites	www.biologycorner.com www.biologyjunction.com www.cpalms.com	
Keeley Probes		
Teacher Hints & Instruction Focus		
Volusia Literacy Tasks (VLT) and Common Lab (CL)	**Volusia Literacy Task (VLT)** **VLT 4- Debate Over Genetically Modified Foods Continues** Students will read the article (digital or print version) and complete the Writing Prompt VLT 4 on the writing template. All resources can be found in the 8th grade VLT folder on EDMODO. **Common Lab (CL)** **CL 4- Hurricane-Proof House Design Challenge** All information for this lab can be found in 8th Grade CL folder on EDMODO . This lab is recommended during the Transition to High School (Bridge to Biology OR Bridge to Earth/Space) Unit. This STEM lab is a long term lab that allows students to build, test, and rebuild a house designed to withstand "hurricane-force" winds.	

Labs and Activities
The following labs and activities can be found on EDMODO in the 8th grade Bridge To Earth/Space folder: Scenario-Based Investigations: Lab The Last Survivors pg. 143-144 Lab Death of A Star pg. 70

Middle Grades ELA Florida Standards	
***English/Language Arts Florida Standards integrated during science labs and activities:** LAFS.68.RST.1.3 – Follow precisely a multistep procedure when carrying out experiments, taking measurement or performing technical tasks. LAFS.68.RST.3.7 – Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flow chart, diagram, model, graph, or table.) *During class discussion and debates (ADI): LAFS.68.SL.1.1 – Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly. a. Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion. b. Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed. c. Pose questions that connect the ideas of several speakers and respond to others' questions and comments with relevant evidence, observations, and ideas. d. Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.	***During Volusia Literacy Tasks (VLT) or ISN activities:** LAFS.68.WHST.1.2 – Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. a) Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension. b) Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples. c) Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts. d) Use precise language and domain-specific vocabulary to inform about or explain the topic. e) Establish and maintain a formal style and objective tone. f) Provide a concluding statement or section that follows from and supports the information or explanation presented. ***During reading in the content area (CLOSE reading, SLAM, ISN, etc.):** LAFS.68.WHST.3.9 – Draw evidence from informational texts to support analysis reflection, and research. LAFS.68.RST.2.4 – 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 6 – 8 text and topics. LAFS.68.RST.4.10 – By the end of grade 8, read and comprehend science / technical text in grades 6 – 8 text complexity band independently and proficiently.

Middle Grades Math Florida Standards	
***All Math Florida Standards integrated during science labs and activities:** MAFS.6.EE.3.9 – Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time. MAFS.6.SP.1.3 – Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. MAFS.8.G.3.9 – Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	MAFS.6.SP.2.5 – Summarize numerical data sets in relation to their context, such as by: a) Reporting the number of observations. b) Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. c) Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. d) Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. MAFS.8.F.2.5 – Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g. where a function is increasing or decreasing, linear or nonlinear.) Sketch a graph that exhibits the qualitative features of a function that have been described verbally.