Weeks 1 – 3T	Weeks 4 – 6G
Unit/Topic **Introductory Science Unit & Scientific Inquiry Skills**	**Unit/Topic** **Units of Measurement**
In this section IDENTIFY **CORE CONTENT 4.1** **Common Core Standards** SC-HS-1.2.1 Students will: • select or construct accurate and appropriate representations for motion (visual, graphical and mathematical); • defend conclusions/explanations about the motion of objects and real-life phenomena from evidence/data. Objects change their motion only when a net force is applied. Newton's Laws of motion are used to describe the effects of forces on the motion of objects. Conservation of mechanical energy and conservation of momentum may also be used to predict motion. DOK 3	**In this section IDENTIFY** **CORE CONTENT 4.1** **Common Core Standards** SC-HS-1.2.1 Students will: • select or construct accurate and appropriate representations for motion (visual, graphical and mathematical); • defend conclusions/explanations about the motion of objects and real-life phenomena from evidence/data. Objects change their motion only when a net force is applied. Newton's Laws of motion are used to describe the effects of forces on the motion of objects. Conservation of mechanical energy and conservation of momentum may also be used to predict motion. DOK 3

CURRICULUM			CURRICULUM		
Week 1	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**
Identify	**Identify**	**Identify**	**Identify**	**Identify**	**Identify**

Sub-Topics • **Scientific Method** • **Inquiry in the Lab**	**Sub-Topics** • **Analyzing Lab Results** • **Graphing**	**Sub-Topics** • **Lab Safety** • **Designing Inquiry Based Labs**	**Sub-Topics** **SI System** **Units of measurement** **Conversion factors**	**Sub-Topics** **Accuracy/Precision** **Scientific Notation**	**Sub-Topics** **Significant Figures** **Dimensional analysis**
I CAN STATEMENTS: **I can…** Design and conduct different kinds of biological investigations for a wide variety of reasons. Explain through analysis and correctness of scientific investigations. Communicate and defend your investigations using evidence and logical connections.	**I CAN STATEMENTS:** **I can…** Report investigation results with graphs, equations, and diagrams Evaluate a conclusion drawn from evidence/data. Accurately create graphs of the motion of an object using appropriate scales and labels.	**I CAN STATEMENTS:** **I can…** Explain that scientists use increasingly sophisticated lab techniques and equipment to solve problems and questions. Properly use equipment, tools, and techniques to improve scientific investigations.	**I CAN STATEMENTS:** Explain the Reasons the SI system has been adopted. Convert between units.	**I CAN STATEMENTS:** Distinguish between accuracy and precision. Write numbers in scientific notation. Perform calculations using scientific notation.	**I CAN STATEMENTS:** Apply rules for significant figures in solving problems. Convert using dimensional analysis.
Critical Vocabulary Hypothesis Independent Variables Dependent Variables Control Variables Data Analysis	**Critical Vocabulary** Accuracy Precision Metrics Volume Density Mass SI units Graph	• **Critical Vocabulary** Accuracy Precision Lab Safety Rules Light microscope (and parts) Transmission & Scanning Electron	**Critical Vocabulary** **SI System** **Giga** **Mega** **Kilo** **Hecto** **Deca** **Deci** **Centi**	**Critical Vocabulary** **Scientific notation**	**Critical Vocabulary** **Significant figures** **Dimensional analysis**

Indirect Relationship Direct Relationship Inferring Theory Law Observing Modeling Research		Microscope Various Lab Equipment Names	**Milli** **Micro** **Nano**		
Suggested Strategies/Activities Student Created Hypothetical Research Assignment: Instructions: You are a scientist conducting research at the University of Floyd. In order to receive money for your research, you need to convince the University that your topic is well thought out and that you are aware of what is needed to make this a valid study. Below you will find the specific headings that you need to address. Of course, this means	**Suggested Strategies/Activities** Mini-Measurement Lab in which students use the SI/metric system standard measurements to use correct values to calculate qualities such as density, mass, volume, etc. SI Conversions and dimensional analysis worksheets. Activities in which students must present data in graphical form.	**Suggested Strategies/Activities** Lab Safety Exam Student Designed Lab: Provide students will two-three "everyday" problems and have them work in small groups to design and complete and inquiry based lab that addresses them using scientific method, data analysis, and lab skills.	**Suggested Strategies/Activities** Mini-lab to convert measurements for comparison of SI system and English system.	**Suggested Strategies/Activities** Students will review the order of the planets from nearest to farthest from the sun and compare the size of the planets using scientific notation. Materials Needed: Marble, walnut, golf ball, raisin, acorn, basketball, soccer ball, softball, small grapefruit, kidney	**Suggested Strategies/Activities** Create and use representations to organize, record, and communicate significant figures. http://antoine.frostburg.edu/cgi-bin/senese/tutorials/sigfig/index.cgi Toss small balls on a bulls-eye to discover the relationship between technique and measurements. Concepts of accuracy and precision are explored. Use a meter stick which has

you must create a topic for your hypothetical research.				bean, post-it pads. The students will use scientific notation with positive exponents to represent large numbers. For this activity the numbers will be the distance from the sun and the diameter of the planet. Match up "pairs" of students for math practice or for a class activity. Prepare two sets of colored 3x5 cards. Let one color represent numbers written in standard decimal notation. Let the second color represent numbers written in scientific notation.	inaccurate markings to take measurements to reinforce that precise measurements are not always accurate. Use a balance with imprecise scales to limit the certainty in their measurements. **Small group Dimensional Analysis Activity** Convert measurements into a recipe for making fudge.

Balanced Assessment: Formative **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e.,**	**Balanced Assessment Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e.,**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)**

grade level, and/or depts..)		**grade level, and/or depts..)**			
Resources Needed Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables

Weeks 7-9	Weeks 10-12
Unit/Topic **Motion & Force**	**Unit/Topic** **Energy**
In this section IDENTIFY **CORE CONTENT 4.1** **Common Core Standards** SC-HS-1.1.2 Students will understand that the atom's nucleus is composed of protons and neutrons that are much more massive than electrons. When an element has atoms that differ in the number of neutrons, these atoms are called different isotopes of the element. SC-HS-2.3.1	**In this section IDENTIFY** **CORE CONTENT 4.1** **Common Core Standards** SC-HS-4.6.1 Students will: • explain the relationships and connections between matter, energy, living systems and the physical environment; • give examples of conservation of matter and energy. As matter and energy flow through different organizational levels (e.g., cells,

Students will: • explain phenomena (falling objects, planetary motion, satellite motion) related to gravity; • describe the factors that affect gravitational force. Gravity is a universal force that each mass exerts on every other mass. DOK 3 ***IDENTIFY GAPS for Math/Literacy in this section. These topics/skills need to be taught for 2 – 3 years to avoid gaps in student learning.***	organs, organisms, communities) and between living systems and the physical environment, chemical elements are recombined in different ways. Each recombination results in storage and dissipation of energy into the environment as heat. Matter and energy are conserved in each change. DOK 3 SC-HS-4.6.2 Students will: • predict wave behavior and energy transfer; • apply knowledge of waves to real life phenomena/investigations. Waves, including sound and seismic waves, waves on water and electromagnetic waves, can transfer energy when they interact with matter. Apparent changes in frequency can provide information about relative motion. DOK 3 *SC-HS-4.6.6* Students will understand that heat is the manifestation of the random motion and vibrations of atoms. SC-HS-4.6.7 Students will: • explain real world applications of energy using information/data; • evaluate explanations of mechanical systems using current scientific knowledge about energy. The universe becomes less orderly and less organized over time. Thus, the overall effect is that the energy is spread out uniformly. For example, in the operation of mechanical systems, the useful energy output is always less than the energy input; the difference appears as heat. DOK 2 ***IDENTIFY GAPS for Math/Literacy in this section. These topics/skills need to be taught for 2 – 3 years to avoid gaps in student learning.***

CURRICULUM			**CURRICULUM**		
Week 7	**Week 8**	**Week 9**	**Week 10**	**Week 11**	**Week 12**
Identify Sub-Topics **Distance & Displacement** **Speed/Velocity** **Acceleration**	**Identify Sub-Topics** **Newton's Laws** **Universal Forces**	**Identify Sub-Topics** **Forces in Liquids** **Buoyancy**	**Identify Sub-Topics** **Forms of Energy**	**Identify Sub-Topics** **Energy Conversion** **Conservation of Energy** **Intro. To Nuclear Chemistry**	**Identify Sub-Topics** **Thermal Energy & Heat**
I CAN STATEMENTS: • Describe motion based on various frames of reference. • Analyze gravitational strength as variables change such as mass and distance.	**I CAN STATEMENTS:** • Use Free Body diagrams to predict predominant forces in a system. • Predict an objects' motion based on forces applied.	**I CAN STATEMENTS:** • Compare the strength of the electromagnetic force to the gravitational force.	**I CAN STATEMENTS:** **Distinguish among kinetic, potential and other forms of energy** **Describe energy transfers in chemical reactions**	**I CAN STATEMENTS:** Describe how energy is released in a nuclear reaction. Compare the amount of energy released in a nuclear reaction and a chemical reaction.	**I CAN STATEMENTS:** Explain the Law of Conservation of Energy.

Critical Vocabulary	Critical Vocabulary	Critical Vocabulary	Critical Vocabulary	Critical Vocabulary	Critical Vocabulary
Motion	Motion	Forces	**Energy**	**Law of conservation of mass and energy**	**Temperature**
Constant Motion	Constant Motion	System	**Potential energy**	**Nuclear fusion**	**Absolute zero**
Accelerated Motion	Accelerated Motion	Inertia	**Kinetic energy**	**Nuclear fission**	**Heat**
Relative Motion	Relative Motion	Gravity	**Mechanical energy**		**Thermal conduction**
Newton's Laws	Newton's Laws	Gravitational Acceleration	**Chemical energy**		**Specific heat**
Forces	Forces	Displacement			
System	System	Mass			
Inertia	Inertia				
Gravity	Gravity				
Gravitational Acceleration	Gravitational Acceleration				
Graph					
Scale					
Axis					
Speed					
Velocity					
Distance					
Displacement					
Mass					
Weight					
Average Velocity					
Instantaneous Velocity					

Suggested Strategies/Activities Conduct investigations involving the motion of objects. **Report investigation results with:** • **Graphs** • **Equations** • **Diagrams** Evaluate a conclusion drawn from evidence/data. .	**Suggested Strategies/Activities** Conduct investigations involving the motion of objects. **Report investigation results with:** • **Graphs** • **Equations** • **Diagrams** Evaluate a conclusion drawn from evidence/data. Accurately create graphs of the motion of an object using appropriate • Scales • Labels Accurately analyze	**Suggested Strategies/Activities** **Report investigation results with:** • **Graphs** • **Equations** • **Diagrams** Accurately create and analyze graphs of the motion of an object using appropriate • Scales • Labels	**Suggested Strategies/Activities** Labs Demonstrations Video clips Manipulatives Calculations Reports Graphs	**Suggested Strategies/Activities** Labs Demonstrations Video clips Manipulatives Calculations Reports Graphs	**Suggested Strategies/Activities** Labs Demonstrations Video clips Manipulatives Calculations Reports Graphs

	graphs of the motion of an object using appropriate • Scales • Labels				
Balanced Assessment: Formative **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response** **Common (PLC Teams will design**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response** **Common (PLC Teams will design the common**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e., grade**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e.,**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response** **Common (PLC Teams will design**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)**

the common assessments, i.e., grade level, and/or depts..)	**assessments, i.e., grade level, and/or depts..)**	**level, and/or depts..)**	**grade level, and/or depts..)**	**the common assessments, i.e., grade level, and/or depts..)**	
Resources Needed Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables

Weeks 13-15	Weeks 16-18
Unit/Topic **Simple Machines**	**Unit/Topic** **Electricity & Magnetism**
In this section IDENTIFY **CORE CONTENT 4.1** **Common Core Standards** SC-HS-4.6.1 Students will: • explain the relationships and connections between matter, energy, living systems and the physical environment; • give examples of conservation of matter and energy. As matter and energy flow through different organizational levels (e.g., cells, organs, organisms, communities) and between living systems and the physical environment, chemical elements are recombined in different ways. Each recombination results in storage and dissipation of energy into the environment as heat. Matter and energy are conserved in each change.	**In this section IDENTIFY** **CORE CONTENT 4.1** **Common Core Standards** SC-HS-1.2.2 Students will: • explain the relationship between electricity and magnetism; • propose solutions to real life problems involving electromagnetism. Electricity and magnetism are two aspects of a single electromagnetic force. Moving electric charges produce magnetic forces or “fields” and moving magnets produce electric forces or “fields”. This idea underlies the operation of electric motors and generators. DOK 3

DOK 3 ***IDENTIFY GAPS for Math/Literacy in this section. These topics/skills need to be taught for 2 – 3 years to avoid gaps in student learning.***			SC-HS-1.2.3 Students will understand that the electric force is a universal force that exists between any two charged objects. Opposite charges attract while like charges repel.		
CURRICULUM			**CURRICULUM**		
Week 13	**Week 14**	**Week 15**	**Week 16**	**Week 17**	**Week 18**
Identify Sub-Topics **Work and Power** **Work and Machines**	**Identify Sub-Topics** **Mechanical Advantage**	**Identify Sub-Topics** **Simple Machines**	**Identify Sub-Topics** **Electric Charge** **Static Electricity** **Current**	**Identify Sub-Topics** **Circuits** **Magnets & Magnetic Fields**	**Identify Sub-Topics** **Electromagnet-ism**
I CAN STATEMENTS: **Relate work to power** **Calculate the amount of work done by a given force exerted on a body**	**I CAN STATEMENTS:** **Calculate the mechanical advantage of a machine**	**I CAN STATEMENTS:** **Identify the 6 types of simple machines** **Identify the principal parts of a lever**	**I CAN STATEMENTS:** **Describe the different kinds of electric charge** **Explain how materials become charged when rubbed together**	**I CAN STATEMENTS:** **Describe how current moves through an electric circuit** **Describe the conditions under which magnetic fields are produced**	**I CAN STATEMENTS:** **Describe the conditions under which magnetic flux through a current loop will induce an electromagnetic field in the loop** **Describe how electromagnetic induction applies to the motor and generator**

Critical Vocabulary **Work** **Power** **Machines** **Mechanical advantage** **Simple Machine** **Compound machine**	**Critical Vocabulary** **Work** **Power** **Machines** **Mechanical advantage** **Simple Machine** **Compound machine**	**Critical Vocabulary** **Work** **Power** **Machines** **Mechanical advantage** **Simple Machine** **Compound machine**	**Critical Vocabulary** **Electric force** **Electric field** **Electric current** **Resistance** **Electric conductor** **Electric insulator**	**Critical Vocabulary** **Series circuit** **Parallel circuit** **Fuse** **Circuit breaker** **Magnetic pole** **Magnetic field**	**Critical Vocabulary** **Solenoid** **Electromagnet** **Electric motor** **Generator** **Alternating current** **Transformer**
Strategies/Activities Labs Demonstrations Video clips Manipulatives Calculations Reports Graphs	**Strategies/Activities** Labs Demonstrations Video clips Manipulatives Calculations Reports Graphs	**Strategies/Activities** Labs Demonstrations Video clips Manipulatives Calculations Reports Graphs	**Strategies/Activities** Labs Demonstrations Video clips Manipulatives Calculations Reports Graphs	**Strategies/Activities** Labs Demonstrations Video clips Manipulatives Calculations Reports Graphs	**Strategies/Activities** Labs Demonstrations Video clips Manipulatives Calculations Reports Graphs
Balanced Assessment: Formative **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs**

Summative Multiple choice/Constructed response **Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)**	**Summative Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)**	**Summative Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)**	**Summative Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)**	**Summative Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)**	**Summative Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)**
Resources Needed Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables

Weeks 19-21	Weeks 22-24

Unit/Topic Waves	Unit/Topic Matter
In this section IDENTIFY CORE CONTENT 4.1 Common Core Standards **SC-HS-4.6.2** **Students will:** • **predict wave behavior and energy transfer;** • **apply knowledge of waves to real life phenomena/investigations.** **Waves, including sound and seismic waves, waves on water and electromagnetic waves, can transfer energy when they interact with matter. Apparent changes in frequency can provide information about relative motion.** **DOK 3** *SC-HS-4.6.3* *Students will understand that electromagnetic waves, including radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, x-rays and gamma rays result when a charged object is accelerated.*	**In this section IDENTIFY CORE CONTENT 4.1 Common Core Standards** SC-HS-1.1.3 Students will understand that solids, liquids and gases differ in the distances between molecules or atoms and therefore the energy that binds them together. In solids, the structure is nearly rigid; in liquids, molecules or atoms move around each other but do not move apart; and in gases, molecules or atoms move almost independently of each other and are relatively far apart. The behavior of gases and the relationship of the variables influencing them can be described and predicted. SC-HS-1.1.4 Students will understand that in conducting materials, electrons flow easily; whereas, in insulating materials, they can hardly flow at all. Semiconducting materials have intermediate behavior. At low temperatures, some materials become superconductors and offer no resistance to the flow of electrons. SC-HS-1.1.5 Students will explain the role of intermolecular or intramolecular interactions on the physical properties (solubility, density, polarity, conductivity, boiling/melting points) of compounds. The physical properties of compounds reflect the nature of the interactions among molecules. These interactions are determined by the structure of the molecule including the constituent atoms. DOK 2

CURRICULUM			CURRICULUM		
Week 19	Week 20	Week 21	Week 22	Week 23	Week 24
Identify Sub-Topics Types of Waves	Identify Sub-Topics Doppler Effect	Identify Sub-Topics Wave Properties Reflection & Refraction	Identify Sub-Topics State of Matter Classifications of Mater	Identify Sub-Topics Physical & Chemical Properties	Identify Sub-Topics Phase Changes
I CAN STATEMENTS: Compare and contrast transverse and longitudinal waves Identify the factors that determine the energy of a wave	I CAN STATEMENTS: Describe the Doppler effect and give examples of its occurrences and applications	I CAN STATEMENTS: Describe the conditions in which constructive and destructive interference can be produced by waves Describe the reflection of a wave from the fixed end of a string and from the free end Describe the refraction of a wave as it passes from one medium to another	I CAN STATEMENTS: Compare the definition of matter and energy and the laws of conservation of matter and energy Describe how matter is classified by state of matter and by composition	I CAN STATEMENTS: Define chemical and physical properties and compare them by providing examples Explain the differences between chemical and physical changes Demonstrate how chemical and physical changes can be used to separate mixtures and compounds into their components	I CAN STATEMENTS: Describe the phase and energy changes associated with boiling/condensing, melting/freezing, and sublimation

		Identify the properties of waves			
Critical Vocabulary **Medium** **Mechanical wave** **Transverse wave** **Longitudinal wave** **Crest** **Trough** **Amplitude** **Wavelength** **Period** **Frequency**	**Critical Vocabulary** **Doppler effect** **Electromagnetic spectrum**	**Critical Vocabulary** **Reflection** **Diffraction** **Refraction** **Interference** **Constructive interference** **Destructive interference** **Standing wave**	**Critical Vocabulary** **Matter** **Element** **Atom** **Molecule** **Compound** **Pure substance** **Mixture**	**Critical Vocabulary** **Melting point** **Boiling point** **Density** **Reactivity** **Physical change** **Chemical change**	**Critical Vocabulary** **Energy** **Evaporation** **Sublimation** **Condensation**
Suggested Strategies/Activities Labs Demonstrations Video clips Manipulatives Calculations Reports Graphs	**Suggested Strategies/Activities** Labs Demonstrations Video clips Manipulatives Calculations Reports Graphs	**Suggested Strategies/Activities** Labs Demonstrations Video clips Manipulatives Calculations Reports Graphs	**Suggested Strategies/Activities** Labs Demonstrations Video clips Manipulatives Calculations Reports Graphs	**Suggested Strategies/Activities** Labs Demonstrations Video clips Manipulatives Calculations Reports Graphs	**Suggested Strategies/Activities** Labs Demonstrations Video clips Manipulatives Calculations Reports Graphs
Balanced Assessment: **Formative** **Quiz** **Exit slips**	**Balanced Assessment:** **Formative** **Quiz** **Exit slips**	**Balanced Assessment:** **Formative** **Quiz** **Exit slips**	**Balanced Assessment:** **Formative** **Quiz** **Exit slips**	**Balanced Assessment:** **Formative** **Quiz** **Exit slips**	**Balanced Assessment:** **Formative** **Quiz** **Exit slips**

Thumbs up/Thumbs down **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)**	**Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)**	**Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)**	**Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)**	**Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)**	**Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response** **Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)**
Resources Needed Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables	**Resources Needed** Textbook Video clips Discovery Education Internet Lab Equipment Consumables

Weeks 25-27	Weeks 28-30
Unit/Topic **Introductory Chemistry**	**Unit/Topic** **Chemical Reactions & Reactions**
In this section IDENTIFY **CORE CONTENT 4.1** **Common Core Standards** SC-HS-1.1.1 Students will classify or make generalizations about elements from data of observed patterns in atomic structure and/or position on the periodic table. The periodic table is a consequence of the repeating pattern of outermost electrons. DOK 2 SC-HS-1.1.2 Students will understand that the atom's nucleus is composed of protons and neutrons that are much more massive than electrons. When an element has atoms that differ in the number of neutrons, these atoms are called different isotopes of the element. SC-HS-1.1.7 Students will: • construct diagrams to illustrate ionic or covalent bonding; • predict compound formation and bond type as either ionic or covalent (polar, nonpolar) and represent the products formed with simple chemical formulas. Bonds between atoms are created when outer electrons are paired by being transferred (ionic) or shared (covalent). A compound is formed when two or more kinds of atoms bind together chemically. DOK 2	**In this section IDENTIFY** **CORE CONTENT 4.1** **Common Core Standards** SC-HS-1.1.6 Students will: • identify variables that affect reaction rates; • predict effects of changes in variables (concentration, temperature, properties of reactants, surface area and catalysts) based on evidence/data from chemical reactions. Rates of chemical reactions vary. Reaction rates depend on concentration, temperature and properties of reactants. Catalysts speed up chemical reactions. DOK 3 ***IDENTIFY GAPS for Math/Literacy in this section. These topics/skills need to be taught for 2 – 3 years to avoid gaps in student learning.***

IDENTIFY GAPS for Math/Literacy in this section. These topics/skills need to be taught for 2 – 3 years to avoid gaps in student learning.					
CURRICULUM			**CURRICULUM**		
Week 25	**Week 26**	**Week 27**	**Week 28**	**Week 29**	**Week 30**
Identify Sub-Topics **Atomic Structure** **Periodic Table**	**Identify Sub-Topics** **Isotopes** **Formulas**	**Identify Sub-Topics** **Bonding**	**Identify Sub-Topics** **Types of Reactions** **Reaction Rates**	**Identify Sub-Topics** **Balancing Equations**	**Identify Sub-Topics** **Exothermic vs. Endothermic**
I CAN STATEMENTS: **Describe the importance of models for the study of atomic structure** **Describe the contributions of scientists and the critical experiments that led to the development of modern atomic theory** **Describe and explain**	**I CAN STATEMENTS:** **Compare the characteristics of isotopes of the same element** **Distinguish between chemical symbols, empirical formulas, molecular formulas, and structural formulas** **Interpret information conveyed by chemical formulas for numbers**	**I CAN STATEMENTS:** **Describe the characteristics of ionic and covalent bonding** **Explain the ionic stability, recognize ionic configurations, and predict ionic configurations for elements (Lewis dot models)** **Describe the nature of**	**I CAN STATEMENTS:** **Classify chemical reactions as being synthesis, decomposition, single replacement, or double displacement reactions** **Analyze factors (temperature , nature of reactants) affecting reaction rates** **Describe the meaning of activation energy**	**I CAN STATEMENTS:** **Write and balance chemical equations, given the names of reactants and products**	**I CAN STATEMENTS:** **Relate the types of reactions as endothermic or exothermic**

the organization of elements into periods and groups in the periodic table **Use the periodic table to determine the atomic number, atomic mass, mass number and number of protons, electrons, neutrons, and number of neutrons in an isotope** **Compare the periodic properties of the elements and how they relate to position in the periodic table**	**of atoms of each element represented** **Use the names, formulas, and charges of commonly referenced polyatomic ions**	**the chemical bond with respect valence electrons in bonding atoms** **Explain how ionic and covalent compounds differ**	**Explain the effects of catalysts on reaction rates**		
Critical Vocabulary **Protons** **Electrons** **Neutrons** **Energy levels** **Metals** **Non-metals** **Semiconductors** **Groups** **Periods**	**Critical Vocabulary** **Isotopes** **Chemical bond** **Empirical formula** **Molecular formula**	**Critical Vocabulary** **Ionic bond** **Covalent bond** **Metallic bond** **Polyatomic ion**	**Critical Vocabulary** **Synthesis reaction** **Decomposition reaction** **Combustion reaction** **Single-displacement reaction** **Double-displacement reaction** **Oxidation-reduction reaction** **Catalyst** **enzyme**	**Critical Vocabulary** **Chemical equation** **Reactants** **Product** **Oxidation number** **Polyatomic ion**	**Critical Vocabulary** **Exothermic reaction** **Endothermic reaction**

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Balanced Assessment: Formative Quiz Exit slips Thumbs up/Thumbs down Teacher circulation Question/Answer Think/Pair/Share Labs **Summative** **Multiple choice/Constructed response**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response**	**Balanced Assessment: Formative** **Quiz** **Exit slips** **Thumbs up/Thumbs down** **Teacher circulation** **Question/Answer** **Think/Pair/Share** **Labs** **Summative** **Multiple choice/Constructed response**

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Weeks 31-33	Weeks 34-36
Unit/Topic **Stoichiometry**	**Unit/Topic** **Gases**
In this section IDENTIFY **CORE CONTENT 4.1** **Common Core Standards** SC-HS-1.1.6 Students will:	**In this section IDENTIFY** **CORE CONTENT 4.1** **Common Core Standards** *SC-HS-1.1.3* *Students will understand that solids, liquids and gases differ in the distances*

• identify variables that affect reaction rates; • predict effects of changes in variables (concentration, temperature, properties of reactants, surface area and catalysts) based on evidence/data from chemical reactions. Rates of chemical reactions vary. Reaction rates depend on concentration, temperature and properties of reactants. Catalysts speed up chemical reactions. DOK 3 SC-HS-1.1.8 Students will: • explain the importance of chemical reactions in a real-world context; • justify conclusions using evidence/data from chemical reactions. Chemical reactions (e.g., acids and bases, oxidation, combustion of fuels, rusting, tarnishing) occur all around us and in every cell in our bodies. These reactions may release or absorb energy. DOK 3	*between molecules or atoms and therefore the energy that binds them together. In solids, the structure is nearly rigid; in liquids, molecules or atoms move around each other but do not move apart; and in gases, molecules or atoms move almost independently of each other and are relatively far apart. The behavior of gases and the relationship of the variables influencing them can be described and predicted.*

CURRICULUM			CURRICULUM		
Week 31	**Week 32**	**Week 33**	**Week 34**	**Week 35**	**Week 36**
Identify Sub-Topics **Mole-Mole, Mass-Mass, Mass-Volume Reactions**	**Identify Sub-Topics** **Limiting Reactants**	**Identify Sub-Topics** **% yield and theoretical yield**	**Identify Sub-Topics** **Molar Mass, Formula Mass**	**Identify Sub-Topics** **Gas Laws**	**Identify Sub-Topics** **Solutions, Molarity, Molality**

I CAN STATEMENTS: **Distinguish between composition stoichiometry and reaction stoichiometry** **Use mole ratios and molar masses to create conversion factors for solving stoichiometry problems**	**I CAN STATEMENTS:** **Distinguish between a limiting reactant and an excess reactant** **Identify the limiting reactant in a problem**	**I CAN STATEMENTS:** **Distinguish between theoretical yield and actual yield** **Use the actual yield and the quantity of the limiting reactant to calculate the percent yield** **Use the percent yield to calculate the actual yield**	**I CAN STATEMENTS:** **Use the mole as a counting unit for large numbers of atoms** **Solve problems with conversions between moles, Avogadro's number, and molar mass** **Calculate the mass of a single atom**	**I CAN STATEMENTS:** **Relate the ideal gas model to observed behavior of real gases** **Use basic gas relationships to solve mathematical problems**	**I CAN STATEMENTS:** **Distinguish between solutions and suspensions** **Distinguish among unsaturated, saturated, and supersaturated solutions** **Relate various ways of expressing concentration data** **Describe the procedure for making solutions of different molarities**
Critical Vocabulary **Stoichiometry**	**Critical Vocabulary** **Excess reactant** **Limiting reactant**	**Critical Vocabulary** **Theoretical yield** **Actual yield**	**Critical Vocabulary** **Atomic mass unit** **Atomic mass** **Molar mass**	**Critical Vocabulary** **Boyle's law** **Charles law** **Dalton's law of partial pressure**	**Critical Vocabulary** **Suspension** **Solvent** **Solute** **Miscible** **Immiscible** **Alloy** **Soluble** **Insoluble** **Solubility** **Unsaturated** **Supersaturated** **Saturated** **Molarity** **Molality**

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