

GBCS Curriculum Guide			GRADE: 9th		SUBJECT: IPS			
Chapter	Pacing	Topics	Standards	Enduring Understandings & Essential Questions	Learning Targets	Vocabulary	Materials	Assessments
Ch. 1 Volume and Mass	Approximately 12 class periods	1.1 Exp. Heating Baking Soda, 1.2 Volume, 1.3 Reading Scales, 1.4 Exp. Measuring Volume by Displacement of Water, 1.5 Equal Arm Balance, 1.6 Unequal Arm Balance, 1.7, Electronic Balance, 1.8 Exp. Balance Sensitivity	C1.1, C1.2, C4.3, P1.1, P1.2	<p>Scientific laws are generalizations based on measurements made many times under controlled conditions to assure their validity.</p> <p>How are scientific laws useful? How are scientific laws discovered?</p> <p>Matter is described and classified according to its characteristic properties.</p> <p>How can substances be distinguished from one another?</p>	Exp. 1.1: The students will determine what happens when baking soda is heated. 1.2 Volume: The students will be able to define volume and learn how it is used in measuring matter. 1.3 Reading Scales: The students will learn how to read scales accurately. 1.4 Measuring by Displacement: Students will measure volume by displacement of water. 1.5, 1.6, 1.7 Balances: The students will be able to distinguish between and describe differences between balances. 1.8 Balance Sensitivity: Students will learn the limitations of their electronic balance.	volume, mass, centimeter, cubic centimeter, meter, pound, scale, milliliter, water displacement, equal arm balance, unequal arm balance, gram, kilogram, calibrate, electronic balance, rider, balance sensitivity.	<p>IPS Equipment: Balance, Equal-Arm Balance, Electronic Beaker, 100 mL Beaker, 250 mL Test tube brush, nylon Bucket, Plastic 5 Quart Ring stand Ring Ring stand clamps (buret) Wire Gauze Bottles, small plastic Crucible, size 00, porcelain Cylinder, graduated 10 mL Cylinder, graduated 50 mL Dish, Evaporating, size 000 porcelain Electrolysis electrodes Funnel, plastic Gram mass set Metal cube, Cylinder, Slab set Bunsen burners Burner tubing, 3/16 I.D. x 3/8 O.D. Strikers Power supply, 6-12V Test tube rack Safety Glasses Scoopula Stirring rods, glass Policeman Stoppers, Rubber #2 Solid Stoppers, Rubber #4 Solid Stoppers, Rubber #4, 1-hole Stoppers, Rubber #4, 2-hole Test tube, Pyrex 20x150mm Test tube, Pyrex 25x150mm Thermometer, 76 mm immersion, -10-110°C Triangle, clay wire Tubing, glass, 6mm, straight Wire leads with Alligator Clips</p> <p>IPS Chemicals and Consumables:</p>	Chapter 1 summative assessment.
Ch. 2 Mass Changes in Closed Systems	Approximately 11 class periods	2.1 Exp. The Mass of Dissolved Salt, 2.2 Histograms, 2.3 Using a Computer to Draw Histograms, 2.4 Exp. The Mass of Ice and Water, 2.5 Exp. Mass of Copper and Sulfur, 2.6 Exp. Mass of a Gas, 2.7 Conservation of Mass, 2.8 Laws of Nature	C1.1, C1.2, C4.3, P5.p1, P1.1, P1.2		2.1, 2.4, 2.5, 2.6 The students be able to define a change in mass as a final value minus an initial value and will learn what a closed system is. 2.2, 2.3 Students will learn how to display class data graphically. 2.7 The students will be able to conclude, based upon lab results, that mass remains constant in closed systems. 2.8 Students will be able to differentiate between law of nature and laws of society.	change, conservation, closed system, histogram, laws of society, laws of nature, law of conservation of mass		Chapter 2 summative assessment

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Ch. 3 Characteristic Properties	Approximately 18 class periods	3.1 Properties of Substances and Objects. 3.2 Exp. Mass and Volume, 3.3 Density, 3.4 Dividing and Multiplying Measured Numbers, 3.5 Exp. Density of Solids, 3.6 Exp. Density of Liquids, 3.7 Exp. Density of a Gas, 3.8 Range of Densities, 3.9 Exp. Freezing and Melting, 3.10 Graphing, 3.11 Exp. Boiling Point, 3.12 Boiling Point and Air Pressure, 3.13 Identifying Substances	C2.2, C5.4, C5.4x, P1.1, P1.2, C3.3, C4.3,		3.1 Students will be able to differentiate between properties of substances and properties of objects. 3.2, 3.3 Students will discover that mass per unit volume is a characteristic property of a substance. 3.4 The students will learn how to correctly report calculated answers. 3.5 , 3.6, 3.7, 3.8 Student will learn how to measure the densities of solids, liquids and gases. 3.9 Students will determine that freezing/melting point is a characteristic property. 3.10 Students will learn proper graphing techniques. 3.11, 3.12 Student will determine that boiling point is a characteristic property which depends upon elevation. 3.13 Students will be able to identify substance based upon their density, melting point and boiling point.	density, characteristic property, property of objects, melting point/freezing point, boiling point, plateau, barometer, barometric pressure, elevation,		Chapter 3 summative assessment
Ch. 4 Solubility	Approximately 13 class periods	4.1 Exp. Dissolving a Solid in Water, 4.2 Concentration, 4.3 Exp. Comparing Concentrations of Saturated Solutions, 4.4 Exp. The Effect of Temperature on Solubility, 4.5 Wood Alcohol and Grain Alcohol, 4.6 Exp. Isopropanol as a Solvent, 4.7 Exp. Solubility of Carbon Dioxide, 4.8 Solubility of Gases, 4.9 Acid Rain, 4.10 Drinking Water	C1.1, C1.2, C3.4, C4.3, C4.7, P1.1, P1.2		4.1 Students will discover that amount of solid that dissolves in a liquid is dependant on the volume of the liquid. 4.2 Students will be able to calculate concentration of a solution. 4.3 Students will learn that solubility is the concentration of a saturated solution. 4.4 Students will learn that solubility of solids increases as the temperature of the liquid increases. 4.5 Student will learn properties of commonly used alcohols. 4.6 Students will learn that solids can be differentiated by comparing solubilities in different solvents. 4.7 Students will determine the solubility of carbon dioxide in water. 4.8 Student will learn that the solubility of gases decreases as the temperature of the solvent increases. 4.9 Students will learn the certain gases, when dissolved, will cause water to become acidic. 4.10 Students will learn that many things are dissolved in the water that they drink.	solution, solute, solvent, saturated solution, unsaturated solution, precipitate, solubility, concentration, isopropanol, methanol, ethanol, acid rain, hard water		Chapter 4 summative assessment

Chapter	Pacing	Topics	Standards	Enduring Understandings & Essential Questions	Learning Targets	Vocabulary	Materials	Assessments
Ch. 5 Separation of Mixtures	Approximately 16 class periods	5.1 Exp. Fractional Distillation, 5.2 Petroleum, 5.3 Separation of Insoluble Solids, 5.4 Exp. Separation of a Mixture of Solids, 5.5 Separation of a Mixture of Soluble Solids, 5.6 Exp. Paper Chromatography, 5.7 A Mixture of Gases: Nitrogen and Oxygen, 5.8 Mixture and Pure Substances.	C1.1, C1.2, C3.3, C4.3, P4.p2, C5.2, C5.8 P1.1, P1.2		5.1 Students will separate and identify a mixture of liquids using characteristic properties 5.2 Students will investigate the use of fractional distillation in the petroleum industry. 5.3 Students will investigate how to separate insoluble solids based on density. 5.4. Students will separate a mixture of solids using solubility. 5.5 Students will investigate separating soluble solids based on changing temperature. 5.6 Students will separate a mixture that is in minute quantities using paper chromatography. 5.7 Students will Investigate the separation of gas mixtures. 5.8 Students will be able to differentiate between mixtures and pure substances.	fractional distillation, petroleum, crude oil, fractionating column, separation by floatation, fractional crystallization, separation by filtration, paper chromatography, mixtures, pure substances		Chapter 5 summative assessment
Ch. 6 Compounds and Elements	Approximately 17 class periods	6.1 Breaking Down Pure Substances, 6.2 Exp. Decomposition of Water, 6.3 Synthesis of Water, 6.4 Exp. Synthesis of Zinc Chloride, 6.5 Law of Constant Proportions, 6.6 Exp. A Reaction with Copper, 6.7 Exp. Separation of a Mixture of Copper Oxide and Copper, 6.8 Complete and Incomplete Reactions, 6.9 Exp. Precipitating Copper, 6.10 Elements, 6.11 Elements Near the Surface of the Earth.	C1.2, C1.1, C2.2, C2.3x, P4.p2, C4.1x, C4.2, C5.2, C5.rlx. C5.7, P1.1, P1.2		6.1 Students will be introduced to idea that some pure substances can be decomposed. 6.2 Students will decompose the pure substance water using electrolysis. 6.3 Students will investigate the process of synthesizing water. 6.4 Students will synthesize the compound zinc chloride. 6.5 Students will investigate the history behind the development of the law of constant proportions. 6.6, 6.7, 6.8, 6.9 Students will investigate the rate of reaction of copper and copper compounds to explore the topics of complete and incomplete reactions, as well as speed of reactions. 6.10 Students will investigate the history of the development of the periodic table of elements. 6.11 Students will survey the most common elements near the surface of the earth.	decomposition, electrolysis, synthesis, compound, law of constant proportions, complete reaction, incomplete reaction, element		Chapter 6 summative assessment

Chapter	Pacing	Topics	Standards	Enduring Understandings & Essential Questions	Learning Targets	Vocabulary	Materials	Assessments
Ch. 12 Heating and Cooling	Approximately 11 class periods	12.1 Introduction, 12.2 Exp. Mixing Warm and Cool Water, 12.3 A Unit of Energy: The Joule, 12.4 Exp. Cooling a Warm Solid in Cool Water, 12.5 Specific Heats of Different Substances, 12.6 Exp. Melting Ice, 12.7 Heat of Fusion and Heat of Vaporization, 12.8 Exp. Heat of Reaction, 12.9 Comparing the Energy Involved in Different Processes	C1.1, C1.2, P4.p1, C2.2, P3.p2, P3.2x, P1.1, P1.2, P3.1, P3.1x, P3.2, P3.6, P4.1, P4.11x		12.1 Students will correlate changes in temperature with changes in energy, 12.2 Students will use a calorimeter to measure changes in temperature in warm and cool water, 12.3 Students will learn the meaning of the Joule, a measurement of energy, 12.4 Students will experimentally determine that the constant of proportionality that relates thermal energy change to the product of mass and temperature change is the specific heat, 12.5 Students will compare and calculate specific heats of different substances, 12.6 Students will use a calorimeter and the concept of specific heat to determine the amount of heat needed to change ice to water, 12.7 Students will learn the definitions of heat of fusion and heat of vaporization and complete practice problems, 12.8 Students will experimentally determine the heat of reaction for a reaction between acid and metal, 12.9 Students will compare and gain perspective on applications of the three heats (fusion, vaporization, and reaction).	temperature, calorimeter, Joule, thermal energy, specific heat, heat of fusion, heat of vaporization, heat of reaction		Chapter 12 summative assessment
Ch. 13 Potential Energy and Kinetic Energy	Approximately 11 class periods	13.1 Exp.: Heating Produced by a Slowly Falling Object, 13.2 Gravitational Potential Energy, 13.3 Kinetic Energy, 13.4 Kinetic Energy as a Function of Speed, 13.5 Exp.: Changing Gravitational Potential Energy to Kinetic Energy, 13.6 The Law of Conservation of Energy	P4.1E, P4.2A,B P4.3A-F,		13.1 Students will investigate if there is a change in energy when an object changes height. 13.2 Students will correlate the change in height to how many joules of energy are given off or produced. 13.3 Students will investigate whether or not a moving object has energy. 13.4 Students will be able to calculate how much energy a moving object has based on its speed and mass. 13.5 Students will be able to relate the amount of potential energy lost to the amount of kinetic energy gained in a system. 13.6 Students will construct a logical argument to explain that the total amount of energy in a closed system remains constant.	gravitational potential energy, kinetic energy, speed, circumference, transforms, elastic potential energy, law of conservation of energy		Chapter 13 summative assessment

Chapter	Pacing	Topics	Standards	Enduring Understandings & Essential Questions	Learning Targets	Vocabulary	Materials	Assessments
Ch. 14 Forces	Approximately 10 class periods	14.1 Introduction, 14.2 Exp. Weight: Gravitation Force, 14.3 Activity: The Elastic Force: Hooke's Law, 14.4 Exp.: The Magnetic Force, 14.5 Exp.: Sliding Friction, 14.6 Friction and Weight, 14.7 Newton's Third Law	C1.1, C1.2, P1.1, P1.2, P3.1, P3.1x, P3.2, P3.3, P3.6, P3.p8, P3.8x		14.1 Students will be able to define a force as a push or a pull. 14.2 Students will understand the difference between mass and weight and use the proportionalisty constant to convert between mass and weight. 14.3 Students will be able to define Hook's Law and understand the proportionality between force and stretch on a spring. 14.4 Students will investigate the inverse relationship between magnetic force and distance of separation. 14.5, 14.6 Students will investigate surface type, surface area, and weight and their affects on frictional force. 14.7 Students will be able to define Newton's third law.	force, weight, spring scale, Newton, Hooke's Law, proportionality, proportionality constant, magnetic force, friction, coefficient of friction, Newton's third law, gravitational force	FME Materials: Balance, electronic Beaker, 100ml Beaker, graduated, 250 ml Blocks, wood Clamp, C4 inch Computers, laptop Cylinder, graduated, 10ml Cylinder, graduated, 50 ml Eyedropper Goggles, safety Measuring tape, 50m Meter stick Metric ruler Motion detector Razor blades, single edged Scale, spring 0-5N Scale, spring 0-10N Spring coil (slinky) Stop watch Test tube, 25mm x 150mm, heat resistant Thermometer, -10 0C to 1100C Washers, O.D. 4.5 cm, 31g, (approximate) Air puck kit Force kit Friction block, large Magnetic force apparatus Motion detector protector Thermometer, high resolution Cleaning solution Coffee filters, 6-8 cup size Coffee stirrers, hollow package Container, 1/2 gal plastic Cups, Styrofoam 8.5 oz. Ice cubes Markers, transparency package Masking tape, role Paper, butchers Paper towels, roll Straws, wide, drinking package String, roll	IPS Chapter 14 summative assessment
Ch. 15 Forces Acting in Different Directions	Approximately 11 class periods	15.1 Balanced Forces on a Line 15.2 Representing Forces in a Plane, 15.3 Exp.: Balanced Forces in a Plane, 15.4 The Net Force, 15.5 Exp. Forces and their components, 15.6 Exp.: Forces Acting on Moving Objects, 15.7: Newton's First Law	C1.1, C1.2, C2.2, C3.3, P1.1, P1.2, P3.1, P3.1x, P3.2, P3.4, P3.6		15.1 Students will learn how forces balance on a line. 15.2 Students will learn how to use a scaling factor to represent forces on paper. 15.3 The students will learn how to combine vectors using parallelograms, 15.4 Students will study the effects of forces combining, called the Net force. 15.5 Students will identify components of a force, 15.6 Students will investigate the effects of forces on moving bodies. 15.7 Students will learn the two parts of Newton's First Law	vector, scaling factor, balanced forces and unbalanced forces, net force, resultant force, components, Newton's First Law.		Chapter 15 summative assessment

Chapter	Pacing	Topics	Standards	Enduring Understandings & Essential Questions	Learning Targets	Vocabulary	Materials	Assessments
FME CH. 4 Distance, Time and Speed	Approximately 9 class periods	4.1 Introduction to Black Boxes, 4.2 Exp. The Motion Detector - Measuring Distance, 4.3 Exp. The Motion Detector - Motion Graphs, 4.4 Distance, Time and Average Speed, 4.5 Exp. Terminal Speed, 4.6 Working with Distance, Time and Constant Speed	C1.1, C1.2, P1.1, P1.2, P2.1, P2.2, P2.3x, P3.1, P3.1x, P3.2, P3.4, P3.5x, P3.6		4.1 Students will be able to define a black box and give examples. 4.2 Students will learn how to use a motion detector. 4.3 Students will learn how to interpret motion from a motion graph. 4.4 Students will calculate speed using distance/time graphs and data tables. 4.5 Students will investigate terminal speed. 4.6 Students will calculate constant speed given distance/time data.	black box, motion detector, notion graphs, average speed, distance, time, terminal speed, constant speed		FME Chapter 4 summative assessment
FME Ch. 5 Waves	Approximately 9 class periods	5.1 Sound: Something that Moves, 5.2 Visualizing Sound: Longitudinal Waves, 5.3 Exp. The Speed of Sound, 5.4 Waves in Gases and Liquids, 5.5 Exp. Transverse Waves on a Coil Spring, 5.6 Waves in Solids, 5.7 Internet Activity: Locating an Earthquake	C1.1, C1.2, C3.3, P1.1, P1.2, P3.1, P3.1x, P3.2, P3.6, P4.4, P4.5, P4.6, P4.8		5.1 Students will learn the differences between wave motion and parical motion. 5.2 Students will witness longitudinal waves on a spring. 5.3 Students will measure and calculate the speed of sound. 5.4 Students will learn the diffence between wave propagation in gases and liquids. 5.5 Students will create transverse waves on a spring and measure the speed of the waves. 5.6 Students will discover how waves behave and travel in solids. 5.7 Students will compelte an internet activity on locating the epicenter of an earthquake.	waves, longitudinal waves, speed of sound, transverse waves, distance, speed, time, epicenter		FME Chapter 5 summative assessment