Lowndes County AP Biology Pacing Guide 2009-2010

MS Frameworks Pacing Guide Worksheet

Grade Level: 9-12
Grading Period: 1st—9 weeks

Chapter/Unit	Lesson Topic	Objective Number	Approximate Days Needed	Suggested Teaching Strategies
		1. Apply inquiry-based and problem-solving processes and skills to scientific investigations.		
Continuous		a. Use current technologies such as CD-ROM, DVD, Internet, and on-line data search to explore current research related to a specific topic. (DOK 3)		• **Nuclear Physics Project** • **Physics of a Sport Project** • **Quantum Physics Project** • **Amusement Park Physics Project**
Continuous		b. Clarify research questions and design laboratory investigations. (DOK 3)		• **Labs throughout** • **Design Your Own Lab Project**

Continuous		c. Demonstrate the use of scientific inquiry and methods to formulate, conduct, and evaluate laboratory investigations (e.g., hypotheses, experimental design, observations, data analyses, interpretations, theory development). (DOK 3)		• **Labs throughout** • **Design Your Own Lab Project**
Continuous		d. Organize data to construct graphs (e.g., plotting points, labeling x-and y-axis, creating appropriate titles and legends for circle, bar, and line graphs) draw conclusions and make inferences. (DOK 3)		• **Labs throughout** • **Design Your Own Lab Project**
Continuous		e. Evaluate procedures, data, and conclusions to critique the scientific validity of research. (DOK 3)		• **Labs throughout** • **Design Your Own Lab Project**

Continuous		f. Formulate and revise scientific explanations and models using logic and evidence (data analysis). (DOK 3)		• **Labs throughout** • **Design Your Own Lab Project**
Continuous		g. Collect, analyze, and draw conclusions from data to create a formal presentation using available technology (e.g., computers, calculators, SmartBoard, CBL's, etc.) (DOK 3)		• **Labs throughout** • **Design Your Own Lab Project**
		2. Develop an understanding of concepts related to forces and motion.		
Unit 1: Mechanics ***Chapter 3/4: Describing Motion/Vectors***	• **Speed** • **Velocity** • **Acceleration** • **Vectors**	a. Use inquiry to investigate and develop an understanding of the kinematics and dynamics of physical bodies. (DOK 3)	**15**	• **Metric Worksheet** • **Unit Table** • **Lab: To the Moon** • **Video: Powers of Ten** • **Lab: Motion in One Dimension** • **Vector Scavenger**

				Hunt Activity
Unit 1: Mechanics ***Chapter 5: A Mathematical Toolkit***	• **p-t graphs** • **v-t graphs** • **Free Fall**	b. Analyze, describe, and solve problems by creating and utilizing graphs of one dimensional motion (e.g., position, distance, displacement, time, speed, velocity, acceleration, the special case of freefall). (DOK 2)	**5**	• **Draw various graphs** • **Group Graphing Lab** • **Practice drawing motion diagrams** • **Parachutes** • **Practice Free Fall Problems** • **Video analysis**
Unit 1: Mechanics ***Chapter 6/7: Forces and Two Dimensional Motion***	• **Newton's Laws** • **Projectile Motion** • **Circular Motion**	c. Analyze real-world applications to draw conclusions about Newton's three laws of motion. (DOK 2)	**10**	• **Video: Newton** • **Practice Problems** • **Lab: Projectile** • **Video Analysis** • **Whirligig Activity** • **Tower Challenge**
Unit 1: Mechanics ***Chapter 8: Universal Gravitation***	• **Universal Gravitation**	d. Apply the effects of the universal gravitation law to graph and interpret the force between two masses, acceleration due to gravity, and planetary motion. (DOK 2)	**10**	• **Your Weight on Other Worlds** • **Your Age on Other Worlds** • **Lab: Pendulums on the Moon** • **Mass the Earth Activity**

Lowndes County Physics Pacing Guide 2009-2010

MS Frameworks Pacing Guide Worksheet

Grade Level: 9-12
Grading Period: 2nd—9 weeks

Chapter/Unit	Lesson Topic	Objective Number	Approximate Days Needed	Suggested Teaching Strategies
		3. Develop an understanding of concepts related to work and energy.		
Unit 1: Mechanics ***Chapter 9: Momentum***	• **Impulse** • **Momentum** • **Conservation of momemtum**	a. Explain and apply the conservation of energy and momentum. (DOK 2)	**10**	• **Lab: Sticky collisions** • **Airbag Activity**

Unit 1: Mechanics ***Chapter 10: Energy, Work, and Machines***	• **Energy** • **Work** • **Machines**	b. Analyze real-world applications to draw conclusions about mechanical potential energy (the energy of configuration). (DOK 3)	**10**	• **Illustrate simple machines** • **Lab: An Uphill Climb** • **Lab: Rube Goldberg** • **Video Analysis**
Unit 1: Mechanics ***Chapter 11 Energy***	• **Forms of Energy** • **Conservation of Energy**	c. Apply the principles of impulse and compare conservation of momentum and conservation of kinetic energy in perfectly inelastic and elastic collisions. (DOK 1)	**10**	• **Diagram energy conservation** • **Lab: Bouncing Ball** • **Video Analysis** • **Trebuchets**
Unit 2: States of Matter ***Chapter 12: Thermal Energy***	• **Temperature and Thermal Energy** • **Change of State and Laws of Thermo-dynamics**	d. Investigate and summarize the principles of thermodynamics. (DOK 2)	**5**	• **Practice Problems** • **Lab: Calorimetry**

Unit 2: States of Matter ***Chapter 13: States of Matter***	• **Gas Laws**	e. Develop the kinetic theory of ideal gases and explain the concept of Carnot efficiency. (DOK 2)	**5**	• **Hot Air Balloons** • **Practice Problems** • **PTV Activity**

Lowndes County Physics Pacing Guide 2009-2010

MS Frameworks Pacing Guide Worksheet

Grade Level: 9-12
Grading Period: 3rd—9 weeks

Chapter/Unit	Lesson Topic	Objective Number	Approximate Days Needed	Suggested Teaching Strategies
		4. Discuss the characteristics and properties of light and sound.		
Unit 3: Waves and Light ***Chapter 14: Waves***	• **Mechanical Waves** • **Wave Properties** • **Wave Behavior**	a. Describe and model the characteristics and properties of mechanical waves. (DOK 2)	**5**	• **Waves on a String Activity** • **Lab: Slinky** • **Draw and label wave**

Unit 3: Waves and Light ***Chapter 14: Waves***	• **Electromagnetic Waves**	e. Investigate and draw conclusions about the characteristics and properties of electromagnetic waves. (DOK 2)	**5**	• **Spectrum Worksheet** • **Draw the EM spectrum**
Unit 3: Waves and Light ***Chapter 15: Sound***	• **Properties of Sound** • **Doppler shift** • **Physics of Music**	b. Differentiate and explain the Doppler effect as it relates to a moving source and to a moving observer. (DOK 1)	**5**	• **Lab: Palm Pipes** • **Sound of Music Acitivity**
Unit 3: Waves and Light ***Chapter 16/17: Light/ Reflection and Refraction***	• **Light Fundamentals** • **Law of Reflection** • **Refraction of Light** • **Snell's Law** • **Applications**	c. Explain the laws of reflection and refraction and apply Snell's law to describe the relationship between the angles of incidence and refraction. (DOK 2)	**10**	• **Laser Light Show** • **Lab: Light, Mirrors, and Lenses**

Unit 3: Waves and Light ***Chapter 18 Mirrors and Lenses***	• **Mirrors** • **Lenses**	d. Use ray tracing and the thin lens equation to solve real-world problems involving object distance from lenses. (DOK 2)	**15**	**Lab: Light, Mirrors, and Lenses (cont)**

Lowndes County Physics Pacing Guide 2009-2010

MS Frameworks Pacing Guide Worksheet

Grade Level: 9-12
Grading Period: 4th—9 weeks

Chapter/Unit	Lesson Topic	Objective Number	Approximate Days Needed	Suggested Teaching Strategies
		5. Apply an understanding of magnetism, electric fields, and electricity.		

Unit 4: Electricity ***Chapter 20, 21,26: Static Electricity, Electric Fields, Electromagnetism***	• **Electrical Charge** • **Electrical Force** • **Electrical Fields** • **Electric and Magnetic Fields**	a. Analyze and explain the relationship between electricity and magnetism. (DOK 2)	**10**	• **Charging Ahead Worksheet** • **A Force to be Reckoned Activity**
Unit 4: Electricity ***Chapter 22/23: Current Electricity/ Series and Parallel Circuits***	• **Current** • **Parallel and Series Circuits** • **Ohm's Law** • **Applications**	b. Use schematic diagrams to analyze the current flow in series and parallel electric circuits, given the component resistances and the imposed electric potential. (DOK 2)	**10**	• **Lab: Ohm's Law** • **Lab: Circuits** • **Electric House Activity** • **Ohm on the Range Activity**
Unit 4: Electricity ***Chapter 24/ 25: Magnetic Fields /Electromagnetic Induction***	• **Magnets** • **Magnetic Fields** • **Electromagnetic Induction** • **Electromotive Force** • **Applications**	c. Analyze and explain the relationship between magnetic fields and electrical current by induction, generators, and electric motors. (DOK 2)	**10**	• **Seeing Magnet Fields Activity** • **Lab: Motor Madness**
		6. Analyze and explain concepts of nuclear physics.		

Unit 5: Modern Physics ***Chapter 30/31 The Nucleus/Nuclear Applications***	• **Radioactive Decay** • **Half Life** • **Particles** • **Particle Accelerators** • **Quark Model** • **Using Nuclear Energy**	a. Analyze and explain the principles of nuclear physics. (DOK 1)	**5**	• **Project: Models, Dioramas, PowerPoints** • **Video: Fat Man**
Unit 5: Modern Physics ***Chapter 27: Quantum Theory***	• **Wave Particle Duality** • **Photoelectric Effect** • **Compton Effect**	b. Defend the wave-particle duality model of light, using observational evidence. (DOK 3)	**5**	• **Video: Elegant Universe** • **Einstein's Riddle Activity** • **Video: Nobel Prize**