



Alignment Document
State of Mississippi and Aventa Learning Physics

Physics
2005-2007 Benchmark Blueprint

Standards	Benchmarks	Unit Name	Course Topic Description
PI.1 Apply fundamental mathematics used in physical concepts.	PI.1.a Utilize fundamental SI base and derived units.	Covered in labs throughout the course	
		Physics and the Laws of Motion	Free-Fall Acceleration Lab
		Physics and the Laws of Motion	Projectile Motion Lab
		Physics and the Laws of Motion	Forces and Friction Lab
		Energy and Motion	Conservation of Mechanical Energy Lab
		Energy and Motion	Momentum Lab
		Energy and Motion	Machines and Efficiency Lab
		Heat and Thermodynamics	Thermal Equilibrium Lab
		Heat and Thermodynamics	Piston Lab
		Waves	Simple Harmonic Motion Lab



		Waves	Wave Lab
		Waves	Sound Lab
		Waves	Converging Lenses Lab
		Electricity	Electrostatics Lab
		Electricity	Current and Resistance Lab
		Electricity	Resistors in Series and Parallel Lab
		Magnetism and Atomic Physics	Magnetic Field of a Solenoid Lab
		Magnetism and Atomic Physics	Electromagnetic Induction Lab
		Magnetism and Atomic Physics	Photoelectric Effect Lab
	PI.1.b Demonstrate proper use of scientific notation and significant figures in calculations and measurements.	Physics and the Laws of Motion	Unit Exam
	PI.1.c Create, extend and record relationships from tables and graphs.	Covered in labs throughout the course	
		Physics and the Laws of Motion	Free-Fall Acceleration Lab
		Physics and the Laws of Motion	Projectile Motion Lab
		Physics and the Laws of Motion	Forces and Friction Lab



	Energy and Motion	Conservation of Mechanical Energy Lab
	Energy and Motion	Momentum Lab
	Energy and Motion	Machines and Efficiency Lab
	Heat and Thermodynamics	Thermal Equilibrium Lab
	Heat and Thermodynamics	Piston Lab
	Waves	Simple Harmonic Motion Lab
	Waves	Wave Lab
	Waves	Sound Lab
	Waves	Converging Lenses Lab
	Electricity	Electrostatics Lab
	Electricity	Current and Resistance Lab
	Electricity	Resistors in Series and Parallel Lab
	Magnetism and Atomic Physics	Magnetic Field of a Solenoid Lab
	Magnetism and Atomic Physics	Electromagnetic Induction Lab
	Magnetism and Atomic Physics	Photoelectric Effect Lab
	PI.1.d Manipulate equations to solve problems.	Covered in labs



		throughout the course	
		Physics and the Laws of Motion	Free-Fall Acceleration Lab
		Physics and the Laws of Motion	Projectile Motion Lab
		Physics and the Laws of Motion	Forces and Friction Lab
		Energy and Motion	Conservation of Mechanical Energy Lab
		Energy and Motion	Momentum Lab
		Energy and Motion	Machines and Efficiency Lab
		Heat and Thermodynamics	Thermal Equilibrium Lab
		Heat and Thermodynamics	Piston Lab
		Waves	Simple Harmonic Motion Lab
		Waves	Wave Lab
		Waves	Sound Lab
		Waves	Converging Lenses Lab
		Electricity	Electrostatics Lab
		Electricity	Current and Resistance Lab
		Electricity	Resistors in Series and

		Magnetism and Atomic Physics	Parallel Lab Magnetic Field of a Solenoid Lab
		Magnetism and Atomic Physics	Electromagnetic Induction Lab
		Magnetism and Atomic Physics	Photoelectric Effect Lab
PI.2 Investigate the kinematics of physical bodies.	PI.2.a Identify terminology associated with kinematics and the history of the ideas associated with motion.	Physics and the Laws of Motion	Two Dimensional Motion and Vectors
		Physics and the Laws of Motion	Forces and the Laws of Motion
	PI.2.b Differentiate between vector and scalar quantities.	Physics and the Laws of Motion	Motion in One Dimension
		PI.2.c Observe, measure, record and graph experimental results involving bodies in motion.	Physics and the Laws of Motion
	Physics and the Laws of Motion		Projectile Motion Lab
	PI.2.d Interpret displacement, velocity, and acceleration graphs.	Physics and the Laws of Motion	Free-Fall Acceleration Lab
PI.2.e Solve problems involving kinematic relationships.	Physics and the Laws of Motion	Free-Fall Acceleration Lab	
	Physics and the Laws of Motion	Projectile Motion Lab	
PI.3 Investigate physical dynamics.	PI.3.a Solve vector problems mathematically and graphically.	Physics and the Laws of Motion	Free-Fall Acceleration Lab
		Physics and the Laws of Motion	Projectile Motion Lab
	PI.3.b Distinguish between weight and mass.	Physics and the Laws of Motion	Forces and the Laws of Motion

	PI.3.c Explain physical dynamics in terms of Newton's Three Laws of Motion.	Physics and the Laws of Motion	Forces and the Laws of Motion
	PI.3.d Solve problems using Newton Three Laws of Motion.	Physics and the Laws of Motion Physics and the Laws of Motion	Forces and the Laws of Motion Forces and Friction Lab
	PI.3.e Apply the principles of impulse and conservation of momentum to interpret Newton's Third Law of Motion.	Energy and Motion	Momentum Lab
	PI.3.f Explain the effects of the Law of Universal Gravitation and calculate the force between two masses.	Energy and Motion	Momentum and Collisions Circular Motion and Gravitation
	PI.3.g Explore the principles and applications for solving problems in two-dimensional motion.	Physics and the Laws of Motion Physics and the Laws of Motion	Motion in Two Dimensions Projectile Motion Lab
	PI.3.h Apply concepts of centripetal force and torque in solving circular motion problems.	Energy and Motion	Circular Motion and Gravitation
PI.4 Explore the concepts and relationships among work, power, and energy.	PI.4.a Identify terminology associated with work, power and energy.	Energy and Motion	Work and Energy
	PI.4.b Apply the Law of Conservation of Energy.	Energy and Motion	Momentum Lab
	PI.4.c Utilize the Work-Energy Theorem to solve problems.	Energy and Motion	Work and Energy
PI.5 Describe the characteristics and properties of mechanical waves.	PI.5.a Describe the types, characteristics and behavior of mechanical waves.	Waves	Vibrations and Waves
		Waves	Sound
		Waves	Light
		Waves	Wave Lab
	PI.5.b Explain conceptually and/or mathematically the Doppler Effect.	Waves	Sound Lab Sound



		Waves	Sound Lab
PI.6 Investigate the principles related to electromagnetic radiation.	PI.6.a Determine the relationship between frequency and wavelength using the constancy of the speed of light.	Waves	Vibrations and Waves
		Waves	Light
	PI.6.b Compare the various components of the electromagnetic spectrum.	Waves	Light
	PI.6.c Describe the characteristics of lenses and mirrors conceptually, mathematically and/or pictorially.	Waves	Light
		Waves	Converging Lenses Lab
PI.7 Measure and calculate the properties of static and current electricity.	PI.7.a Identify terminology and units associated with electricity.	Electricity	Electric Forces and Fields
		Electricity	Electrical Energy and Current
		Electricity	Circuits and Circuit Elements
	PI.7.b Describe the characteristics of an electric field.	Electricity	Electrostatics Lab
		Electricity	Electric Forces and Fields
	PI.7.c Describe, measure and/or calculate the properties of stationary and moving electric charges (using Coulomb's Law and Ohm's Law).	Electricity	Electrostatics Lab
		Electricity	Current and Resistance Lab
PI.7.d Determine current, voltage, and resistance involved in series and parallel circuits.	Electricity	Resistors in Series and Parallel Lab	
	Electricity	Circuits and Circuit Elements	