AVENTA LEARNING

Alignment Document
State of Kansas and Aventa Learning Physics

Physics
2005-2007 Benchmark Blueprint

Standards	Topics	Benchmarks	Unit Name	Course Topic Description
1 The student will develop the abilities necessary to do scientific inquiry and develop an understanding of scientific inquiry.	**1.1** The student will demonstrate the abilities necessary to do scientific inquiry.	**1.1.1** actively engages in asking and evaluating research questions.	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

1-800-594-5504 | info@aventalearning.com

			Heat and Thermodynamics	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
		1.1.2 actively engages in investigations, including developing questions, gathering and analyzing data, and designing and conducting research	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
			Heat and Thermodynamics	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

		1.1.3 actively engages in using technological tools and mathematics in their own scientific investigations.	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
			Heat and Thermodynamics	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
		1.1.4 actively engages in conducting an inquiry, formulating and revising his or her scientific explanations and models (physical, conceptual, or mathematical) using logic and evidence, and recognizing that potential alternative explanations and models should be considered.	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	Piston Lab

			Thermodynamics	
			Heat and Thermodynamics	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
		1.1.5 actively engages in communicating and defending the design, results, and conclusion of his/her investigation.	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	Forces and Friction Lab

			Laws of Motion	
			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
			Heat and Thermodynamics	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
2B The student will develop an understanding of the structure of atoms, compounds, chemical reactions, and the interactions of energy and matter.	**2B.1** The student will understand the relationships between force and motion.	**2B.1.1** understands Newton's Laws and the variables of time, position, velocity, and acceleration can be used to describe the position and motion of particles.	Physics and the Laws of Motion	Forces and the Laws of Motion
		2B.1.2 understands physicists use conservation laws to analyze the motion of objects.	Energy and Motion Energy and Motion	Work and Energy Momentum and Collisions
	2B.2 The student will understand the conservation of mass and energy, and the First and Second Laws of Thermodynamics.	**2B.2.1** understands matter has energy. Mass and energy can be interchanged. The total energy in the universe is constant, but the type of energy may vary.		
		2B.2.2 understands the first law of thermodynamics states the total internal energy of a substance (the sum of all the kinetic and potential energies of its constituent molecules) will change only if heat is exchanged with the environment or work is done on or by the substance. In any physical interaction, the total energy in the universe is conserved.	Heat and Thermodynamics	Heat
		2B.2.3 understands the second law of thermodynamics that states the entropy of the universe is increasing.	Heat and Thermodynamics	Thermodynamics
	2B.3 The student will understand the nature of the fundamental interactions of matter and energy.	**2B.3.1** There are four fundamental forces in nature: strong nuclear force, weak nuclear force, electromagnetic force, and gravitational force.		
		2B.3.2 understands waves have energy and can transfer energy when they interact with matter.	Waves Waves	Vibrations and Waves Sound
		2B.3.3 The student understands interference - how waves interact with other waves.	Waves	Light
		2B.3.4 The student will understand the	Waves	Light

		principles of reflection and refraction.		
		2B.3.5 understands electromagnetic waves result when a charged particle is accelerated or decelerated.		
		2B.3.6 The student understands basic electrostatics and circuits.	Electricity Electricity	Circuits and Circuit Elements Resistors in Series and Parallel Lab
5 The student will develop understandings about the relationship between science and technology.	**5.1** The student will develop an understanding that technology is applied science.	**5.1.1** understands technology is the application of scientific knowledge for functional purposes.	Electricity	Circuits and Circuit Elements
		5.1.2 understands creativity, imagination, and a broad scientific knowledge base are required to produce useful results.		
		5.1.3 understands science advances new technologies. New technologies open new areas for scientific inquiry.	Magnetism and Atomic Physics	Magnetism
7 The student will develop understanding of science as a human endeavor, the nature of scientific knowledge, and historical perspectives.	**7.1** The student will develop an understanding that science is a human endeavor that uses models to describe and explain the physical universe.	**7.1.1** demonstrates an understanding of science as both vocation and avocation.		
		7.1.2 explains how science uses peer review, replication of methods, and norms of honesty.		
		7.1.3 recognizes the universality of basic science concepts and the influence of personal and cultural beliefs that embed science in society.	Magnetism and Atomic Physics	Atomic Physics
		7.1.4 recognizes that society helps create the ways of thinking (mindsets) required for scientific advances, both toward training scientists and educating a populace to utilize benefits of science (e.g., standards of hygiene, attitudes toward forces of nature, etc.).	Electricity Magnetism and Atomic Physics	Circuits and Circuit Elements Electromagnetic Induction
		7.1.5 understands there are many issues which involve morals, ethics, values or spiritual beliefs that go beyond what		

		science can explain, but for which solid scientific literacy is useful.		
		7.1.6 recognizes society's role in supporting topics of research and determining institutions where research is conducted.	Electricity Magnetism and Atomic Physics	Circuits and Circuit Elements Electromagnetic Induction
	7.2 The student will develop an understanding of the nature of scientific knowledge.	**7.2.1** understands scientific knowledge describes and explains the physical world in terms of matter, energy, and forces. Scientific knowledge is provisional and is subject to change as new evidence becomes available.	Magnetism and Atomic Physics	Atomic Physics
		7.2.2 understands scientific knowledge begins with empirical observations, which are the data (also called facts or evidence) upon which further scientific knowledge is built.	Physics and the Laws of Motion	Motion in One Dimension
		7.2.3 understands scientific knowledge consists of hypotheses, inferences, laws, and theories.	Physics and the Laws of Motion	Motion in One Dimension
		7.2.4 understands a testable hypothesis or inference must be subject to confirmation by empirical evidence	Covered in labs throughout the course Physics and the Laws of Motion Physics and the Laws of Motion Physics and the Laws of Motion Energy and Motion	 Free-Fall Acceleration Lab Projectile Motion Lab Forces and Friction Lab 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
			Heat and Thermodynamics	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
	7.3 The student will understand science from historical perspectives.	**7.3.1** demonstrates an understanding of the history of science.		
		7.3.2 demonstrates a knowledge that		

		scientific method historically proceeded from an inductive approach rather than a deductive approach.		