

Active Physics Correlation to Mississippi Standards

Correlation key:	Communication			Home			Medicine			Predictions			Sports			Transportation		
<p>"X" Coverage = Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept.</p> <hr/> <p>"XX" In-depth coverage = primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept.</p>	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3

Physics I

1. Apply fundamental mathematics used in physical concepts.

a. Utilize fundamental SI base and derived units.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
b. Demonstrate proper use of scientific notation and significant figures in calculations and measurements.										X								
c. Create, extend and record relationships from tables and graphs.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
d. Manipulate equations to solve problems.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

2. Investigate the kinematics of physical bodies.

a. Identify terminology associated with kinematics and the history of the ideas associated with motion.												XX	XX	XX	XX	XX	XX	XX	X
b. Differentiate between vector and scalar quantities.																			
c. Observe, measure, record and graph experimental results involving bodies in motion.	XX					X						XX	XX	XX	XX	XX	XX	XX	XX
d. Interpret displacement, velocity, and acceleration graphs.												XX	X	XX	XX	XX	XX	XX	X
e. Solve problems involving kinematics relationships.												XX	X	XX	XX	XX	XX	XX	X

3. Investigate physical dynamics.

a. Solve vector problems mathematically and graphically.																			
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b. Distinguish between weight and mass.											XX		X	XX	XX			XX
c. Explain physical dynamics in terms of Newton Three Laws of Motion.											XX			XX			XX	
d. Solve problems using Newton Three Laws of Motion.											XX			XX			XX	
e. Apply the principles of impulse and conservation of momentum to interpret Newton Third Law of Motion.														XX			XX	
f. Explain the effects of the Law of Universal Gravitation and calculate the force between two masses.												XX			X			
g. Explore the principles and applications for solving problems in two-dimensional motion.											XX	XX	XX	XX	XX	XX	XX	X
h. Apply concepts of centripetal force and torque in solving circular motion problems.											X			X		XX		
4. Explore the concepts and relationships among work, power, and energy.																		
a. Identify terminology associated with work, power and energy.	X			XX	XX	XX	X		XX			XX	XX	X				
b. Apply the Law of Conservation of Energy.					XX	X	X											
c. Utilize the Work-Energy Theorem to solve problems.																		
5. Describe the characteristics and properties of mechanical waves.																		
a. Describe the types, characteristics and behavior of mechanical waves.	XX	XX										XX						
b. Explain conceptually and/or mathematically the Doppler Effect.			X						X									

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6. Investigate the principles related to electromagnetic radiation.

a. Determine the relationship between frequency and wavelength using the constancy of the speed of light.			XX									XX						X
b. Compare the various components of the electromagnetic spectrum.	X		X															
c. Describe the characteristics of lenses and mirrors conceptually, mathematically and/or pictorially.	XX		XX					XX										

7. Measure and calculate the properties of static and current electricity.

a. Identify terminology and units associated with electricity.					XX	XX											X	
b. Describe the characteristics of an electric field.						XX												
c. Describe, measure and/or calculate the properties of stationary and moving electric charges (using Coulomb Law and Ohm Law).																		
d. Determine current, voltage, and resistance involved in series and parallel circuits.					XX	X												

Physics II

1. Investigate mechanics of physical motion (Review of Physics I).

a. Apply fundamental mathematics used in physical concepts.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
b. Investigate physical kinematics and dynamics of one and two-dimensional motion.																		

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c. Explore the concepts and relationships among work, power, energy, and momentum.	X			XX	XX	XX	X		XX			XX	XX	X				
2. Investigate the principles related to thermal energy.																		
a. Interpret the principles of the Kinetic Molecular Theory and the Laws of Thermodynamics.																		
b. Apply principles of the Kinetic Molecular Theory to changes of state for solids, liquids, gases, and plasma.																		
c. Solve problems with heat energy transfer, entropy and enthalpy.					X													
3. Investigate properties and principles of fluids.																		
a. Determine pressure using Pascal's Principle.																		
b. Differentiate between hydrostatics and hydrodynamics.																		
c. Interpret and apply Bernoulli principle.																		
d. Evaluate the behaviors of fluids (surface tension, capillary action adhesion, and effects of pressure on boiling and melting points).																		
e. Discuss the plasma state.																		
4. Investigate the principles and applications of magnetism.																		
a. Identify the properties of magnetism (fields, forces, etc.).		XX				XX						X						
b. Establish the interactions between current flow and magnetic fields.		XX				XX												
c. Explain the principle of induction.		XX				XX												

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d. Solve problems with magnetic fields, magnetic forces, and induction.		XX				X												
e. Relate principles of electromagnetism to the operation of motors, generators, transformers, electromagnets, etc.		X				XX												
5. Investigate the principles of the Quantum Theory.																		
a. Describe and analyze the dual nature of light.																		
b. Discuss the photoelectric and Compton effects.																		
c. Explain quantum energy absorption and emission spectra.			X															
6. Investigate the principles of nuclear physics.																		
a. Discuss types and properties of elementary and other subatomic particles.										X								
b. Discuss applications of nuclear energy.																		
c. Differentiate between nuclear fission and fusion and the net energy of both.																		
d. Write nuclear equations for fission and fusion reactions.																		
e. Examine creation of plasma and ionic propulsion.																		
7. Investigate relativity.																		
a. Define frames of reference and the space-time continuum.												XX						
b. Discuss the main components of Special Relativity Theory.												X						

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c. Investigate the applications of special relativity to motions of observer and observed.												XX						
d. Calculate relativistic length, time, and mass.											X							
e. Discuss the main components of General Relativity Theory.											X							
8. Investigate current theories of physics.																		
a. Discuss Grand Unification Theories.																		
b. Research black holes, worm holes, and dimensions.																		