

Correlation of *Physics: Principles and Problems* to Mississippi Science Framework, Physics I Competencies and Objectives Grade 11 By Lesson

Section	Mississippi Competencies and Objectives
Chapter 1 What is physics?	
Chapter 2 A Mathematical Toolkit	
2.1	1a, 1b
2.2	1b
2.3	1c
Chapter 3 Describing Motion	
3.1	2c
3.2	1a, 1b; 2c, 2e
3.3	2a, 2c, 2e
Chapter 4 Vector Addition	
4.1	2a, 2b, 2c, 2d, 2e; 3a
4.2	2a, 2b, 2c, 2e; 3a
Chapter 5 A Mathematical Model of Motion	
5.1	1c, 1d; 2a, 2c, 2d, 2e; 3a
5.2	1c; 2a, 2c, 2d; 3a
5.3	1c, 1d; 2a, 2c, 2d, 2e; 3a
5.4	1c; 2a, 2d
Chapter 6 Forces	
6.1	1a; 2a, 2b; 3a, 3c, 3d
6.2	1a, 1d; 2a, 2b; 3a, 3b, 3c, 3d
6.3	2a; 3c, 3d
Chapter 7 Forces and Motion in Two Dimensions	
7.1	1a, 1b, 1d; 3g
7.2	1a, 1b, 1d; 3g
7.3	1a, 1b, 1d; 3g, 3h
Chapter 8 Universal Gravitation	
8.1	1a, 1b, 1c, 1d; 2d; 3f, 3h
8.2	1a, 1d; 2d; 3b, 3f, 3h
Chapter 9 Momentum and Its Conservation	
9.1	3e
9.2	1a, 1b, 1d; 3e
Chapter 10 Energy, Work, and Simple Machines	
10.1	4a, 4c
10.2	4a, 4c
Chapter 11 Energy	
11.1	1a, 1b, 1d; 3f; 4a
11.2	1c; 4a, 4b

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Section	Mississippi Competencies and Objectives
Chapter 12 Thermal Energy	
12.1	4b
12.2	4b
Chapter 13 States of Matter	
13.1	1a, 1b, 1d
13.2	1b, 1d
Chapter 14 Waves and Energy Transfer	
14.1	5a
14.2	5a
Chapter 15 Sound	
15.1	5b
15.2	1c
Chapter 16 Light	
16.1	6a, 6b
16.2	
Chapter 17 Reflection and Refraction	
17.1	1a, 1b, 1d
17.2	1d
Chapter 18 Mirrors and Lenses	
18.1	6c
18.2	6c
Chapter 19 Diffraction and Interference of Light	
19.1	1a, 1b, 1d
19.2	1d
Chapter 20 Static Electricity	
20.1	7a, 7c
20.2	7a, 7c
Chapter 21 Electric Fields	
21.1	7a, 7b, 7c
21.2	7a, 7b, 7c
Chapter 22 Current Electricity	
22.1	7a, 7c
22.2	7a
Chapter 23 Series and Parallel Circuits	
23.1	7a, 7d
23.2	7d
Chapter 24 Magnetic Fields	
24.1	7c
24.2	1a, 1b, 1d; 7c

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Section	Mississippi Competencies and Objectives
Chapter 25 Electromagnetic Induction	
25.1	1a
25.2	4b
Chapter 26 Electromagnetism	
26.1	1a, 1b
26.2	6b
Chapter 27 Quantum Theory	
27.1	4b
27.2	1a, 1b, 1d
Chapter 28 The Atom	
28.1	1a, 1b; 6b
28.2	
Chapter 29 Solid State Electronics	
29.1	1a, 1b, 1d
29.2	1a, 1b, 1d; 7d
Chapter 30 The Nucleus	
30.1	1c
30.2	1a, 1b, 1d
Chapter 31 Nuclear Applications	
31.1	4b
31.2	1a, 1b; 7d

Mississippi Science Framework Physics I

CONTENT STRANDS: <i>Life Science (L), Earth and Space Science, (E) Physical Science (P)</i>	
COMPETENCIES AND SUGGESTED TEACHING OBJECTIVES:	
1. Apply fundamental mathematics used in physical concepts. (P)	
a.	Utilize fundamental SI base and derived units.
b.	Demonstrate proper use of scientific notation and significant figures in calculations and measurements.
c.	Create, extend and record relationships from tables and graphs.
d.	Manipulate equations to solve problems.
2. Investigate the kinematics of physical bodies. (P)	
a.	Identify terminology associated with kinematics and the history of the ideas associated with motion.
b.	Differentiate between vector and scalar quantities.
c.	Observe, measure, record and graph experimental results involving bodies in motion.
d.	Interpret displacement, velocity, and acceleration graphs.
e.	Solve problems involving kinematic relationships.
3. Investigate physical dynamics. (E, P)	
a.	Solve vector problems mathematically and graphically.
b.	Distinguish between weight and mass.
c.	Explain physical dynamics in terms of Newton's Three Laws of Motion.
d.	Solve problems using Newton's Three Laws of Motion.
e.	Apply the principles of impulse and conservation of momentum to interpret Newton's Third Law of Motion.
f.	Explain the effects of the Law of Universal Gravitation and calculate the force between two masses.
g.	Explore the principles and applications for solving problems in two-dimensional motion.
h.	Apply concepts of centripetal force and torque in solving circular motion problems.
4. Explore the concepts and relationships among work, power, and energy. (P)	
a.	Identify terminology associated with work, power and energy.
b.	Apply the Law of Conservation of Energy.
c.	Utilize the Work-Energy Theorem to solve problems.
5. Describe the characteristics and properties of mechanical waves. (P)	
a.	Describe the types, characteristics and behavior of mechanical waves.
b.	Explain conceptually and/or mathematically the Doppler Effect.
6. Investigate the principles related to electromagnetic radiation. (P)	
a.	Determine the relationship between frequency and wavelength using the constancy of the speed of light.
b.	Compare the various components of the electromagnetic spectrum.
c.	Describe the characteristics of lenses and mirrors conceptually, mathematically and/or pictorially.

COMPETENCIES AND SUGGESTED TEACHING OBJECTIVES:

7. Measure and calculate the properties of static and current electricity. (P)

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