

**Glencoe/McGraw-Hill**

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**correlated to**

**Alabama Course of Study for Physics  
Grades 9-12**

**GLENCOE/MCGRAW-HILL**  
**PHYSICS: PRINCIPLES AND PROBLEMS ©2005**  
**CORRELATED TO**  
**ALABAMA COURSE OF STUDY FOR PHYSICS**

**GRADES 9-12**

<b>OBJECTIVES</b>	<b>PAGE REFERENCES</b>
1. Explain linear, uniform circular, and projectile motions using one- and two-dimensional vectors.	
<ul style="list-style-type: none"> <li>• Explaining the significance of slope and area under a curve when graphing distance-time or velocity-time data</li> </ul>	SE: 58, 59, 60, 61, 62, 63 TWE: 58, 59, 60, 61, 62, 63
<ul style="list-style-type: none"> <li>• Describing forces that act on an object</li> </ul>	SE: 86–95, 96–101, 102, 118–125, 126–130, 131–135, 147–152, 160–161 TWE: 86–95, 96–101, 102, 118–125, 126–130, 131–135, 147–152, 160–161
2. Define the law of conservation of momentum. (AHSGE Standard VII: 1)	
<ul style="list-style-type: none"> <li>• Calculating the momentum of a single object</li> </ul>	SE: 228–232, 233–235, 243–245 TWE: 228–232, 233–235, 243–245
<ul style="list-style-type: none"> <li>• Calculating momenta of two objects before and after collision in one-dimensional motion</li> </ul>	SE: 229, 236–237, 241–242 TWE: 229, 236–237, 241–242
3. Explain planetary motion and navigation in space in terms of Kepler’s and Newton’s laws. (AHSGE Standard VIII: 1)	SE: 172–173, 174, 175–178, 179, 186–187 TWE: 172–173, 174, 175–178, 179, 186–187
4. Describe quantitative relationships for velocity, acceleration, force, work, power, potential energy, and kinetic energy.	SE: 43–47, 59–64, 88, 90–93, 258–260, 286–287, 293–294, 376–378 TWE: 43–47, 59–64, 88, 90–93, 258–260, 286–287, 293–294, 376–378

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<b>OBJECTIVES</b>	<b>PAGE REFERENCES</b>
5. Explain the concept of entropy as it relates to heating and cooling, using the laws of thermodynamics.	
<ul style="list-style-type: none"> <li>• Using qualitative and quantitative methods to show the relationship between changes in heat energy and changes in temperature</li> </ul>	SE: 313–316, 317–318, 319–322  TWE: 313–316, 317–318, 319–322
6. Describe wave behavior in terms of reflection, refraction, diffraction, constructive and destructive wave interference, and Doppler effect. (AHSGE Standard VII: 2)	
<ul style="list-style-type: none"> <li>• Explaining reasons for differences in speed, frequency, and wavelength of a propagating wave in varying materials</li> </ul>	SE: 390–391, 485–487, 488–490, 491–492  TWE: 390–391, 485–487, 488–490, 491–492
<ul style="list-style-type: none"> <li>• Describing uses of different components of the electromagnetic spectrum, including radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X rays, and gamma radiation</li> </ul>	SE: 697, 708, 711–712, 713, 733–734, 819, 824–825  TWE: 697, 708, 711–712, 713, 733–734, 819, 824–825
<ul style="list-style-type: none"> <li>• Demonstrating particle and wave duality</li> </ul>	SE: 439–443, 515–517, 518–519, 520–521, 724–725, 726–729, 731–734  TWE: 439–443, 515–517, 518–519, 520–521, 724–725, 726–729, 731–734
<ul style="list-style-type: none"> <li>• Describing change of wave speed in different media</li> </ul>	SE: 391, 485, 486–487, 488–490, 491–492  TWE: 391, 485, 486–487, 488–490, 491–492

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<b>OBJECTIVES</b>	<b>PAGE REFERENCES</b>
7. Describe properties of reflection, refraction, and diffraction.	
<ul style="list-style-type: none"> <li>• Demonstrating the path of light through mirrors, lenses, and prisms</li> </ul>	SE: 457–463, 464–469, 470–473, 474–475, 485–492, 493–499, 500–503, 504–505  TWE: 457–463, 464–469, 470–473, 474–475, 485–492, 493–499, 500–503, 504–505
<ul style="list-style-type: none"> <li>• Describing the effect of filters and polarization on the transmission of light</li> </ul>	SE: 443–444, 448–449  TWE: 443–444, 448–449
8. Summarize similarities in the calculation of electrical, magnetic, and gravitational forces between objects.	
<ul style="list-style-type: none"> <li>• Determining the force on charged particles using Coulomb’s law</li> </ul>	SE: 549–550, 551, 552  TWE: 549–550, 551, 552
9. Describe quantitative relationships among charge, current, electrical potential energy, potential difference, resistance, and electrical power for simple series, parallel, or combination direct current (DC) circuits.	SE: 542–544, 569–571, 575–576, 577–579, 593–594, 595–597, 603, 606–607, 618–620, 621–622, 623–624, 625–626, 629–630, 671–673, 674–675  TWE: 542–544, 569–571, 575–576, 577–579, 593–594, 595–597, 603, 606–607, 618–620, 621–622, 623–624, 625–626, 629–630, 671–673, 674–675

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