

Automotive Technology 6th Edition

Chapter 13 – Scientific Principle and Materials

Lesson Plan



CHAPTER SUMMARY:

1. Scientific Method
 2. Energy principles, torque, work, power and horsepower
 3. Newton's Laws of Motion, kinetic energy, and inertia
 4. Mechanical principles, heat and temperature, and Acids and bases
 5. Gas laws, sound, and acoustics
 6. Plastics, iron and steel, SAE steel designations, and aluminum alloys
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OBJECTIVES:

1. Discuss the use of scientific methods and energy principles in solving problems.
 2. Explain the relationship between torque, work, power, and horsepower.
 3. Explain the importance of Newton's laws of motion, kinetic energy, inertia, and mechanical principles in brake design.
 4. Discuss the concepts of heat, temperature, pH scale, gas laws, and acoustics.
 5. Describe the types of plastics, iron, steel, and aluminum alloys.
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RESOURCES: (All resources may be found at <http://www.jameshalderman.com>)

1. **Task Sheet:** Water Boil Experiment
 2. Chapter PowerPoint
 3. Chapter Crossword Puzzle and Word Search
 4. Animations: Math Formula Horse Power and Math Formula Vehicle Speed
 5. Animations: Math Formula Circle Area and Math Formula Eng-Metric Conversion, Area
 6. Animations: Math Formula, Eng-Metric Conversion – Volume
 7. Animations: Math Formula, Eng to Metric – Length
 8. Animations: Math Formula, lb ft to lb in – Torque
 9. Animations: Math Formula, Gear Ratio and Math Formula, lb in to lb ft – Torque
 10. Animations: Math Formula, Metric-Eng Conversion – Temp
 11. Animations: Math Formula, Metric-Eng Conversion – Area and Math Formula, Metric-Eng – Pressure
 12. Animations: Math Formula, Metric-Eng Conversion – Volume
 13. Videos: The Scientific method (time 10:39) and Work and work energy principles (time 5:47)
 14. Videos: Torque (time 9:56) and Newton's First Law of Motion (time 9:32)
 15. Videos: Potential and Kinetic Energy (time 6:06) and Mass and Inertia (time 6:08)
 16. Videos: SAE Steel Grades (time 9:49)
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ACTIVITIES:

1. **Task Sheet:** Have students complete Water Boil Experiment Task Sheet.
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ASSIGNMENTS:

1. Chapter crossword and word search puzzles.
 2. Complete end of chapter 10 question quiz.
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CLASS DISCUSSION:

1. Review and group discussion chapter Frequently Asked Questions and Tech Tips sections.
 2. Review and group discussion of the five (5) chapter Review Questions.
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NOTES AND EVALUATION:
