

# Automotive Fuel and Emissions Control Systems 4/E

## Chapter 2 Environmental and Hazardous Materials














### Opening Your Class











KEY ELEMENT	EXAMPLES
Introduce Content	This course or class covers operation and service of <b>Automotive Fuel and Emissions Control Systems</b> . It correlates material to task lists specified by ASE and NATEF.
Motivate Learners	Explain how the knowledge of how something works translates into the ability to use that knowledge to figure why the engine does not work correctly and how this saves diagnosis time, which translates into more money.
State the learning objectives for the chapter or course you are about to cover and explain this is what they should be able to do as a result of attending this session or class.	Explain the chapter learning objectives to the students. <ol style="list-style-type: none"><li>1. List the characteristics used by federal and state laws to determine if a material is hazardous.</li><li>2. Discuss asbestos hazards and asbestos handling guidelines.</li><li>3. Explain the storage and disposal of brake fluid, used oil, coolants, lead-acid batteries, used tires, and air-conditioning refrigerant oil.</li><li>4. Discuss the characteristics of hazardous solvents, fuel safety and storage, and airbag handling.</li><li>5. Explain the Hazardous Materials Identification Guide issued by the Environmental Protection Agency (EPA).</li></ol>
Establish the Mood or Climate	Provide a <i>WELCOME</i> , Avoid put downs and bad jokes.
Complete Essentials	Restrooms, breaks, registration, tests, etc.
Clarify and Establish Knowledge Base	Do a round robin of the class by going around the room and having each student give their backgrounds, years of experience, family, hobbies, career goals, or anything they want to share.

**NOTE: This lesson plan is based on Fuel & Emission Control 4<sup>th</sup> Edition Chapter Images found on Jim's web site @**

**[www.jameshalderman.com](http://www.jameshalderman.com)**

**LINK CHP 2: [Chapter Images](#)**

ICONS	Ch02 Environmental & Hazardous Materials
            	<p><b>1. SLIDE 1 ENVIRONMENTAL &amp; HAZMAT</b></p> <p>Check for <b>ADDITIONAL VIDEOS &amp; ANIMATIONS</b>  @ <a href="http://www.jameshalderman.com/">http://www.jameshalderman.com/</a>  <b>WEB SITE IS CONSTANTLY UPDATED</b></p> <p><u>Videos</u></p> <p>At the beginning of this class, you can download the crossword puzzle &amp; Word Search from the links below to familiarize your class with the terms in this chapter &amp; then discuss them</p> <p><b>Crossword Puzzle (<a href="#">Microsoft Word</a>) (<a href="#">PDF</a>)</b>  <b>Word Search Puzzle (<a href="#">Microsoft Word</a>) (<a href="#">PDF</a>)</b></p> <p><b><u>RESEARCH ON INTERNET EPA'S LIST OF HAZARDOUS MATERIALS. STUDENTS USE INTERNET &amp; GO ON THE EPA WEB SITE</u></b></p> <p><b><u>DISCUSS WHICH OF THESE IS FOUND IN AN AUTOMOTIVE SHOP OR SCHOOL LAB</u></b>  <b>HOST DISCUSSION ON HAZARDOUS MATERIALS FOUND IN LAB</b></p> <p><b>2. SLIDE 2 EXPLAIN FIGURE 2-1</b> Material safety data sheets (MSDS) should be readily available for use by anyone in the area who may come into contact with hazardous materials</p> <p><b><u>SHOW &amp; EXPLAIN MSDS SHEET: SHOW AN EXAMPLE OF MSDS SHEET &amp; EXPLAIN IT DIFFERENT SECTIONS</u></b></p> <p><b><u>ANIMATION: MATERIAL SAFETY DATA SHEET</u></b>  <a href="http://media.pearsoncmg.com/ph/chet/chet_myautomotivelab_2/animations/a1_animation/chapter02_fig_02_1/index.htm">HTTP://MEDIA.PEARSONCMG.COM/PH/CHET/CHET_MYAUTOMOTIVELAB_2/ANIMATIONS/A1_ANIMATION/CHAPTER02_FIG_02_1/INDEX.HTM</a>  <b><u>OZONE DEPLETION (VIEW) (DOWNLOAD)</u></b></p> <p><b>COMPLETE TASK SHEET 1 ON MSDS</b></p>

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         	<p>3. <b>SLIDE 3 EXPLAIN FIGURE 2.2</b> All brakes should be moistened with water or solvent to help prevent brake dust from becoming airborne</p> <p><b><u>DEMONSTRATION: SHOW STUDENTS WET-DOWN PROCEDURE FOR BRAKES LIKE FIGURE 2-2</u></b></p> <p><b><u>DEMONSTRATION: SHOW STUDENTS HOW TO DISPOSE OF BRAKE FLUID</u></b></p> <p><b><u>DEMONSTRATION: SHOW CORROSIVENESS OF BRAKE FLUID BY POURING ON PAINTED OBJECT</u></b></p> <p><b><u>VIDEO ON END OF DAY</u></b>  <b><u>WWW.MYAUTOMOTIVELAB.COM 1.37 MINUTES</u></b>  <a href="http://media.pearsoncmg.com/PH/CHET/CHET_MYLABS/AKAMAI/TEMPLATE/VIDEO640X480.PHP?TITLE=END%20OF%20DAY&amp;CLIP=PANDC/CHET/2012/AUTOMOTIVE/AUTO_SHOP_SAFETY/CLIP41SEQ1.MOV&amp;CAPTION=CHET/CHET_MYLABS/AKAMAI/2012/AUTOMOTIVE/AUTO_SHOP_SAFETY/XML/CLIP41SEQ1.XML">HTTP://MEDIA.PEARSONCMG.COM/PH/CHET/CHET_MYLABS/AKAMAI/TEMPLATE/VIDEO640X480.PHP?TITLE=END%20OF%20DAY&amp;CLIP=PANDC/CHET/2012/AUTOMOTIVE/AUTO_SHOP_SAFETY/CLIP41SEQ1.MOV&amp;CAPTION=CHET/CHET_MYLABS/AKAMAI/2012/AUTOMOTIVE/AUTO_SHOP_SAFETY/XML/CLIP41SEQ1.XML</a></p> <p>4. <b>SLIDE 4 EXPLAIN FIGURE 2.3</b> A typical aboveground oil storage tank.</p> <p><b><u>DEMONSTRATION: CUT TOP OFF OLD OIL FILTER. SHOW FILTERING ELEMENT &amp; ALL OF PARTICLES IT HAS FILTERED. THIS IS REASON WHY YOU HAVE TO DRAIN FILTER BEFORE DISPOSAL</u></b></p> <p>5. <b>SLIDE 5 EXPLAIN FIGURE 2.4</b> Washing hands and removing jewelry are two important safety habits all service technicians should practice.</p> <p><b><u>HOLD DISCUSSION ON SOLVENTS USED IN SHOP. ASK STUDETNS TO DISCUSS COMMON SOLVENTS USED IN THE SHOP</u></b></p> <p>6. <b>SLIDE 6 EXPLAIN FIGURE 2.5</b> Typical fireproof flammable storage cabinet</p> <p>7. <b>SLIDE 7 EXPLAIN FIGURE 2.6</b> Using a water-based cleaning system helps reduce the hazards from using strong chemicals.</p> <p>8. <b>SLIDE 8 EXPLAIN FIGURE 2.7</b> Used antifreeze coolant should be kept separate and stored in a leakproof container until it can be recycled or disposed of according to federal, state, and local laws. Note that the storage barrel is placed inside another container to catch any coolant that may spill out of the inside barrel.</p>

