

Automotive Technology 6th Edition

Chapter 7 Environmental & Hazardous Materials

Opening Your Class

KEY ELEMENT	EXAMPLES
Introduce Content	This Automotive Technology 6th text provides complete coverage of automotive components, operation, design, and troubleshooting. It correlates material to task lists specified by ASE and ASE Education (NATEF) and emphasizes a problem-solving approach. Chapter features include Tech Tips, Frequently Asked Questions, Case Studies, Videos, Animations, and ASE Education (NATEF) Task Sheets.
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 as listed: <ol style="list-style-type: none"> 1. Identify hazardous waste materials in accordance with state and federal regulations and follow proper safety precautions while handling hazardous waste materials. 2. Discuss asbestos hazards and asbestos handling guidelines. 3. Explain the storage and disposal of brake fluid, used oil, coolants, lead-acid batteries, used tires, and air-conditioning refrigerant oil. 4. Explain the characteristics of hazardous solvents, fuel safety and storage, and airbag handling.
Establish the Mood or Climate	Provide a WELCOME , 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 the 6th Edition Chapter Images found on Jim's web site @ www.jameshalderman.com

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<http://www.jameshalderman.com/>

[automotive_principles.html](#) NOTE: You can use Chapter Images or possibly Power Point files:

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1. SLIDE 1 CH7 HEALTH & ENVIRONMENTAL AWARENESS



Check for **ADDITIONAL VIDEOS & ANIMATIONS**
@ <http://www.jameshalderman.com/>
WEB SITE IS CONSTANTLY UPDATED



VIDEO: POLLUTION PREVENTION
[HTTP://WWW.YOUTUBE.COM/WATCH?V=UII78UAEGHE](http://www.youtube.com/watch?v=UII78UAEGHE)
VIDEO: HAZMAT
[HTTP://WWW.YOUTUBE.COM/WATCH?V=WDDL5YCHAW](http://www.youtube.com/watch?v=WDDL5YCHAW)



USE ANIMATION
OZONE DEPLETION (VIEW) (DOWNLOAD)



[http://www.jameshalderman.com/
automotive_principles.html](http://www.jameshalderman.com/automotive_principles.html)

DOWNLOAD

Crossword Puzzle (Microsoft Word) (PDF)

Word Search Puzzle (Microsoft Word) (PDF)



**RESEARCH ON INTERNET EPA'S LIST OF
HAZARDOUS MATERIALS. STUDENTS USE INTERNET
& GO ON THE EPA WEB SITE**












**WARNING HAZARDOUS WASTE DISPOSAL LAWS
INCLUDE SERIOUS PENALTIES FOR ANYONE
RESPONSIBLE FOR BREAKING THESE LAWS.**









**DISCUSS WHICH OF THESE IS FOUND IN AN
AUTOMOTIVE SHOP OR SCHOOL LAB
HOST DISCUSSION ON HAZARDOUS MATERIALS
FOUND IN LAB**



2. SLIDE 2 FIGURE 7-1 **EXPLAIN** Safety Data Sheets (SDS) should be readily available for use by anyone in the area who may come into contact with hazardous materials.

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	<p>SHOW & EXPLAIN SDS SHEET: SHOW AN EXAMPLE OF SDS SHEET & EXPLAIN IT DIFFERENT SECTIONS. NOTE: SDS WAS FORMERLY CALLED THE MSDS (MATERIAL SAFETY DATA SHEET)</p>
	<p>HANDS-ON COMPLETE SAFETY DATA SHEET (SDS) TASK SHEET</p>
	<p>3. SLIDE 3 FIGURE 7-2 EXPLAIN Tag that identifies the electrical power has been removed and service work is being done.</p>
	<p>4. SLIDE 4 FIGURE 7-3 EXPLAIN All brakes should be moistened with water or solvent to help prevent brake dust from becoming airborne.</p>
	<p>WARNING NEVER USE COMPRESSED AIR TO BLOW BRAKE DUST. THE FINE TALC-LIKE BRAKE DUST CAN CREATE A HEALTH HAZARD EVEN IF ASBESTOS IS NOT PRESENT OR IS PRESENT IN DUST RATHER THAN FIBER FORM..</p>
	<p>DEMONSTRATION: SHOW STUDENTS WET-DOWN PROCEDURE FOR BRAKES LIKE FIGURE 7-3</p>
	<p>VIDEO FLUID DESPOSAL HTTP://WWW.YOUTUBE.COM/WATCH?V=ARRBUW6Y36Q</p>
	<p>DEMONSTRATION: SHOW STUDENTS HOW TO DISPOSE OF BRAKE FLUID DEMONSTRATION: SHOW CORROSIVENESS OF BRAKE FLUID BY POURING ON PAINTED OBJECT</p>
	<p>5. SLIDE 5 FIGURE 7-4 EXPLAIN A typical aboveground oil storage tank</p>

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	<p>DEMONSTRATION: CUT TOP OFF OLD OIL FILTER. SHOW STUDENTS FILTERING ELEMENT & ALL OF PARTICLES IT HAS FILTERED. THIS IS REASON WHY YOU HAVE TO DRAIN FILTER BEFORE DISPOSAL</p>
	<p>VIDEO FLUID DESPOSAL HTTP://WWW.YOUTUBE.COM/WATCH?V=ARRBUW6Y36Q</p>
	<p>HOLD DISCUSSION ON SOLVENTS USED IN SHOP. ASK STUDETNS TO DISCUSS COMMON SOLVENTS USED IN THE SHOP</p>
	<p>5. SLIDE 5 FIGURE 7-5 EXPLAIN Used antifreeze coolant should be kept separate and stored in a leak proof 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> <p>6. SLIDE 6 FIGURE 7-6 EXPLAIN Air-conditioning refrigerant oil must be kept separated from other oils because it contains traces of refrigerant and must be treated as hazardous waste..</p>
	<p>HOST DISCUSSION ON THE DIFFERENT REFRIGERANTS & REFRIGERANT OILS</p>
	<p>HOST DISCUSSION ON CHART 7-1 TYPICAL WASTE MATERIALS GENERATED AT AUTO REPAIR SHOPS AND TYPICAL CATEGORY (HAZARDOUS OR NONHAZARDOUS) BY DISPOSAL METHOD</p>

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EXPLAIN TECH TIP: REMOVE COMPONENTS THAT CONTAIN MERCURY

Some vehicles have a placard near the driver's side door that lists components that contain the heavy metal, mercury. Mercury can be absorbed through the skin and is a heavy metal that, once absorbed by the body, does not leave. • SEE FIGURE 7-7. These components should be removed from the vehicle before the rest of the body is sent to be recycled to help prevent releasing mercury into the environment.



7. SLIDE 7 FIGURE 7-7 Placard near driver's door, including what devices in the vehicle contain mercury.



EXPLAIN TECH TIP: WHAT EVERY TECHNICIAN SHOULD KNOW: OSHA has adopted new hazardous chemical labeling requirements making it agree with global labeling standards established by UN. As a result, workers will have better information available on safe handling and use of hazardous chemicals, allowing them to avoid injuries & possible illnesses related to exposures to hazardous chemicals. • SEE FIGURE 7-8.



8. SLIDE 8 FIGURE 7-8 OSHA global hazardous materials labels.

WARNING HAND SAFETY

SERVICE TECHNICIANS SHOULD WASH THEIR HANDS WITH SOAP & WATER AFTER HANDLING ENGINE OIL, DIFFERENTIAL OIL, OR TRANSMISSION FLUIDS OR WEAR PROTECTIVE RUBBER GLOVES. ANOTHER SAFETY HINT IS THAT THE SERVICE TECHNICIAN SHOULD NOT WEAR WATCHES, RINGS, OR OTHER JEWELRY THAT COULD COME IN CONTACT WITH ELECTRICAL OR MOVING PARTS OF A VEHICLE. SEE FIGURE 7-9...

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9. **SLIDE 9 FIGURE 7-9 EXPLAIN** Washing hands and removing jewelry are two important safety habits all service technicians should practice.

10. **SLIDE 10 FIGURE 7-10** Typical fireproof flammable storage cabinet.



DISCUSS FREQUENTLY ASKED QUESTION:
How can you tell if a solvent is hazardous? If a solvent or any of the ingredients of a product contains “fluor” or “chlor,” then it is likely to be hazardous. Check instructions on label for proper use and disposal procedures.



HAVE STUDENTS DO INTERNET SEARCH FOR PUBLIC & PRIVATE ORGANIZATIONS THAT HELP RECYCLE USED AUTOMOTIVE BATTERIES.



HAVE STUDENTS RESEARCH INTERNET FOR WHAT IS DONE WITH RECYCLED AUTOMOTIVE TIRES