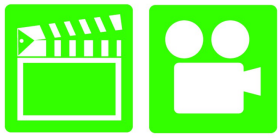
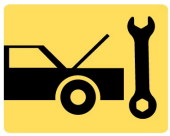
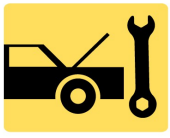
A8 Engine Performance 4th Edition

Chapter 2 Environmental and Hazardous Materials

Opening Your Class

KEY ELEMENT	EXAMPLES
Introduce Content	This course or class covers operation and service of **Automotive Engine Performance.** 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. 1. Identify hazardous waste materials in accordance with state and federal regulations and follow safety precautions while handling and disposing of hazardous waste materials. 2. Prepare for the ASE assumed knowledge content required by all service technicians to adhere to environmentally appropriate actions and behavior.
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.

ICONS	Ch02 Environmental & Hazardous Materials
	1. SLIDE 1 ENVIRONMENTAL & HAZMAT 2. SLIDE 2 EXPLAIN OBJECTIVES
	Check for ADDITIONAL VIDEOS & ANIMATIONS @ http://www.jameshalderman.com/ WEB SITE IS CONSTANTLY UPDATED
	USE ANIMATION EPA HAZARDOUS MATERIAL IDENTIFICATION WWW.MYAUTOMOTIVELAB.COM HTTP://MEDIA.PEARSONCMG.COM/PH/CHET/CHET_MYAUTOMOTIVELAB_2/ANIMATIONS/A1_ANIMATION/CHAPTER02_FIG_02_11/INDEX.HTM
	RESEARCH ON INTERNET EPA'S LIST OF HAZARDOUS MATERIALS. STUDENTS USE INTERNET & GO ON THE EPA WEB SITE
	DISCUSS WHICH OF THESE IS FOUND IN AN AUTOMOTIVE SHOP OR SCHOOL LAB HOST DISCUSSION ON HAZARDOUS MATERIALS FOUND IN LAB
	3. SLIDES 3-6 EXPLAIN Federal and State Laws 7. SLIDE 7 EXPLAIN FIGURE 2-1 Material safety data sheets (MSDS) should be readily available for use by anyone in the area who may come into contact with hazardous materials
	SHOW & EXPLAIN MSDS SHEET: SHOW AN EXAMPLE OF MSDS SHEET & EXPLAIN IT DIFFERENT SECTIONS
	TIME-CHECK: NOTE ON TIME CHECK: DEPENDING ON TIME, YOU MAY WANT TO MOVE NEXT SECTION TO FOLLOWING DAY OR CONTINUE ON WITH INSTRUCTION
	ANIMATION: MATERIAL SAFETY DATA SHEET HTTP://MEDIA.PEARSONCMG.COM/PH/CHET/CHET_MYAUTOMOTIVELAB_2/ANIMATIONS/A1_ANIMATION/CHAPTER02_FIG_02_1/INDEX.HTM
	COMPLETE TASK SHEET 1 ON MSDS

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	8. SLIDES 8-9 EXPLAIN ASBESTOS HAZARDS 10. SLIDE 10 EXPLAIN FIGURE 2.2 All brakes should be moistened with water or solvent to help prevent brake dust from becoming airborne
	**DEMONSTRATION: SHOW STUDENTS WET-DOWN PROCEDURE FOR BRAKES LIKE FIGURE 2-2**
	**DEMONSTRATION: SHOW STUDENTS HOW TO DISPOSE OF BRAKE FLUID** **DEMONSTRATION: SHOW CORROSIVENESS OF BRAKE FLUID BY POURING ON PAINTED OBJECT**
	**VIDEO ON END OF DAY** **WWW.MYAUTOMOTIVELAB.COM 1.37 MINUTES** HTTP://MEDIA.PEARSONCMG.COM/PH/CHET/CHET_MYLABS/AKAMAI/TEMPLATE/VIDEO640X480.PHP?TITLE=END%20OF%20DAY&CLIP=PANDC/CHET/2012/AUTOMOTIVE/AUTO_SHOP_SAFETY/CLIP41SEQ1.MOV&CAPTION=CHET/CHET_MYLABS/AKAMAI/2012/AUTOMOTIVE/AUTO_SHOP_SAFETY/XML/CLIP41SEQ1.XML
	10. SLIDES 11-12 EXPLAIN Used Brake Fluid Used Oil 13. SLIDE 13 EXPLAIN FIGURE 2.3 A typical aboveground oil storage tank.
	**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**
	**SHOW VIDEO ON USED OIL** **WWW.MYAUTOMOTIVELAB.COM 2 MINUTES** HTTP://MEDIA.PEARSONCMG.COM/PH/CHET/CHET_MYLABS/AKAMAI/TEMPLATE/VIDEO640X480.PHP?TITLE=MOTOR%20OIL&CLIP=PANDC/CHET/2012/AUTOMOTIVE/AUTO_SHOP_SAFETY/CLIP11MOTOROIL1.MOV&CAPTION=CHET/CHET_MYLABS/AKAMAI/2012/AUTOMOTIVE/AUTO_SHOP_SAFETY/XML/CLIP11MOTOROIL1.XML
	14. SLIDE 14 EXPLAIN Solvents and Coolant Disposal 15. SLIDE 15 EXPLAIN FIGURE 2.4 Washing hands and removing jewelry are two important safety habits all service technicians should practice.
	**HOLD DISCUSSION ON SOLVENTS USED IN SHOP. ASK STUDETNS TO DISCUSS COMMON SOLVENTS USED IN THE SHOP**
	16. SLIDE 16 EXPLAIN SOLVENTS 17. SLIDE 17 EXPLAIN FIGURE 2.5 Typical fireproof flammable storage cabinet 18. SLIDE 18 EXPLAIN FIGURE 2.6 Using a water-based cleaning system helps reduce the hazards from using strong chemicals.

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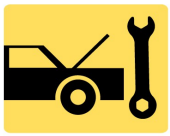
	19. SLIDE 19 EXPLAIN Lead-Acid Battery Waste and Fuel 20. SLIDE 20 EXPLAIN FIGURE 2.7 Used antifreeze coolant should be kept separate and stored in a leakproof container until it can be recycled or disposed of according to federal, state, and local laws. Note that the storage barrel is placed inside another container to catch any coolant that may spill out of the inside barrel.
	**VIDEO ON ANTI-FREEZE** **WWW.MYAUTOMOTIVELAB.COM 1 MINUTE** HTTP://MEDIA.PEARSONCMG.COM/PH/CHET/CHET_MYLABS/AKAMAI/TEMPLATE/VIDEO640X480.PHP?TITLE=ANTI%20FREEZE&CLIP=PANDC/CHET/2012/AUTOMOTIVE/AUTO_SHOP_SAFETY/CLIP10ANTIFREEZE1.MOV&CAPTION=CHET/CHET_MYLABS/AKAMAI/2012/AUTOMOTIVE/AUTO_SHOP_SAFETY/XML/CLIP10ANTIFREEZE1.XML
	21. SLIDE 21 EXPLAIN FIGURE 2.8 This red gasoline container holds about 30 gallons of gasoline and is used to fill vehicles used for training
	**SHOW VIDEO ON GASOLINE** **WWW.MYAUTOMOTIVELAB.COM** HTTP://MEDIA.PEARSONCMG.COM/PH/CHET/CHET_MYLABS/AKAMAI/TEMPLATE/VIDEO640X480.PHP?TITLE=GASOLINE&CLIP=PANDC/CHET/2012/AUTOMOTIVE/AUTO_SHOP_SAFETY/CLIP9GAS1.MOV&CAPTION=CHET/CHET_MYLABS/AKAMAI/2012/AUTOMOTIVE/AUTO_SHOP_SAFETY/XML/CLIP9GAS1.XML
	**HAVE STUDENTS RESEARCH INTERNET FOR WHAT IS DONE WITH RECYCLED AUTOMOTIVE TIRES**
	22. SLIDE 22 EXPLAIN OTHER DISPOSALS 23. SLIDE 23 EXPLAIN FIGURE 2.9 Air-conditioning refrigerant oil must be kept separated from other oils because it contains traces of refrigerant and must be treated as hazardous waste. 24. SLIDE 24 EXPLAIN FIGURE 2.10 Placard near driver's door, including what devices in the vehicle contain mercury. 25. SLIDE 25 EXPLAIN FIGURE 2.11 Environmental Protection Agency (EPA) Hazardous Materials Identification Guide is a standardized listing of hazards and the protective equipment needed.
	**SHOW VIDEO ON REFRIGERANTS FROM** **WWW.MYAUTOMOTIVELAB.COM** HTTP://MEDIA.PEARSONCMG.COM/PH/CHET/CHET_MYLABS/AKAMAI/TEMPLATE/VIDEO640X480.PHP?TITLE=REFRIGERANTS&CLIP=PANDC/CHET/2012/AUTOMOTIVE/AUTO_SHOP_SAFETY/CLIP12REFRIG1.MOV&CAPTION=CHET/CHET_MYLABS/AKAMAI/

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 	2012/AUTOMOTIVE/AUTO_SHOP_SAFETY/XML/CLIP12REFRIG1.XML **HOST DISCUSSION ON THE DIFFERENT REFRIGERANTS & REFRIGERANT OILS** **26. SLIDE 26 EXPLAIN SUMMARY**