Module 18 Lesson Plan

Owning a Vehicle and Trip Planning

Content

Essential Knowledge and Skills 38-44

- Driving Within the Highway Transportation System
- Automobile Insurance
- Purchasing a Vehicle
- Maintaining a Vehicle
- Planning a Trip
- Conserving Resources
- Assignment
- Assessment

OPI
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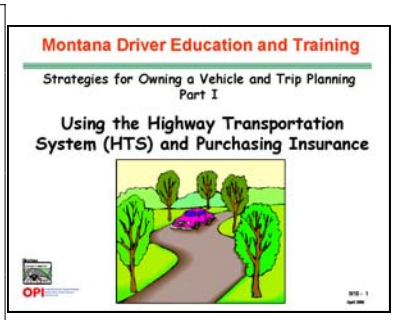
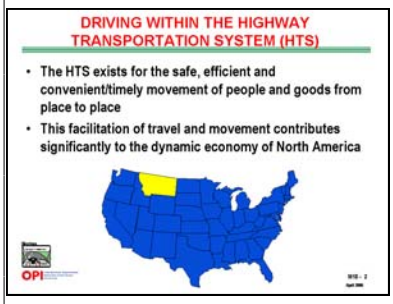
M18—Owning a Vehicle and Trip Planning

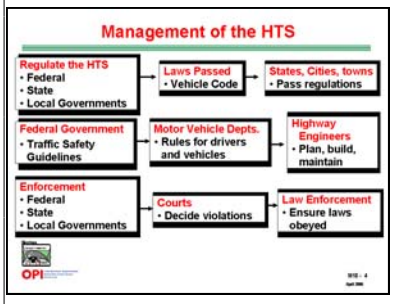
Lesson Objective: The student reviews the Highway Transportation System; knows Montana motor vehicle insurance requirements; analyzes data and utilizes critical thinking and problem solving skills to purchase a new or used automobile; assesses vehicle operation and malfunctions to eliminate or prevent malfunctions; and plans a trip; selects routes; predicts personal and vehicular needs; and calculates costs.

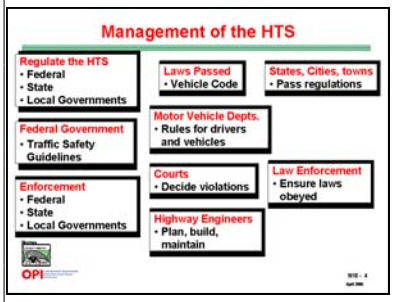
Instructional Topic	Content	Slide
DRIVING WITHIN THE HIGHWAY TRANSPORTATION SYSTEM (HTS)	**Introduce, model, practice and discuss** The Highway Transportation System (HTS) is part of our North American transportation system, which includes rail, air, sea, underground, and pedestrian traffic as well as motor vehicle transportation • Motor vehicles, streets and highways, drivers, cyclists, and pedestrians are all part of the highway transportation system • When you drive, you become part of this massive system • The HTS exists for the safe, efficient and convenient/timely movement of people and goods from place to place • This facilitation of travel and movement contributes significantly to the dynamic economy of North America	T18-1 T18-2
◆ **The Highway Transportation System**	There are three components to the HTS **1. <u>People</u>** — the people who use the HTS by walking, driving or riding are called roadway users • Roadway users vary greatly in their ability to use the system **2. <u>Vehicles</u>** — think about the wide range of vehicles that use the HTS • Mopeds and motorcycles are small and have little protection • The other extreme is the tractor- semi trailer, which weighs tons • Between the above examples are cars, vans, small trucks, buses, campers, farm vehicles, and construction equipment **3. <u>Roadways</u>** — roadways of the HTS vary from dirt lanes to complex multi-lane expressways • Common conditions such as rain, darkness, or rough pavement can become major problems • It is up to drivers to maintain control of their vehicle at all times and in all conditions	T18-3
◆ **Management of the HTS**	Many federal, state, and local government agencies help regulate the HTS • The federal government has established the National Highway Safety Act with a set of traffic safety guidelines • Federal, state and local governments in turn enforce these national guidelines ... Laws are passed to make up the vehicle code ... Enforcement agencies assure that laws are obeyed ... Motor vehicle departments set rules to assure that driver and vehicle standards are met	T18-4

Student Learning Activities	Resources



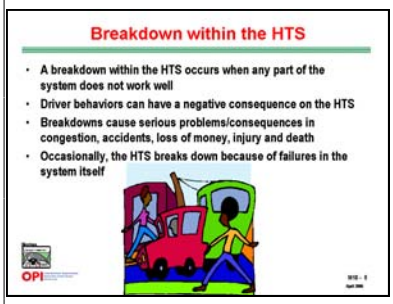






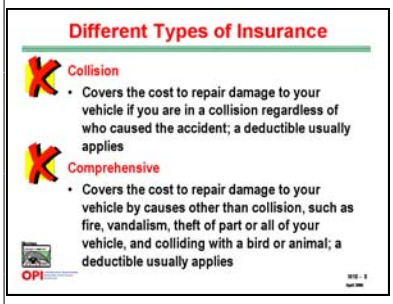
Instructional Topic	Content	Slide
◆ **Management of the HTS (Cont.)**	Courts decide whether drivers charged with violating the laws are guilty or innocent • Highway traffic engineers plan, build, and maintain the complex system of roadways • Federal law established a maximum speed of 55 in 1974 ... In 1995, the law was changed to allow states to set their own highway speeds • The National Traffic and Motor Vehicle Safety Act require automakers to build certain safety features such as safety belts and shatterproof windows into vehicles ... It also requires manufacturers to correct defects discovered after vehicles are sold • The National Highway Safety Act establishes specific guidelines for state motor vehicle safety programs • States, cities, and towns pass regulations that must be obeyed within their limits	T18-5
◆ **Breakdown within the HTS**	A breakdown within the HTS occurs when any part of the system does not work well • Driver behaviors can have a negative consequence on the HTS Breakdowns cause serious problems/consequences in congestion, accidents, loss of money, injury and death • The ability to drive responsibly will be the major factor in helping drivers avoid being part of these breakdowns • Those who fail to show courtesy to other drivers or who violate the law often end up causing collisions • Drivers who never bother to perform routine maintenance on their vehicles will inevitably have a breakdown • Occasionally, the HTS breaks down because of failures in the system itself • When urban planners fail to construct enough lanes on a freeway or offer alternative forms of public transportation, the result can be rush-hour gridlock • Sometimes roads close for construction, repair, or snow/ice removal	
AUTOMOBILE INSURANCE	It is in the public's best interest to make sure that people using the roads are able to pay for damages they cause to others • Vehicle owners buy insurance to protect them from unexpected financial loss • There are different types of insurance that can be purchased	T18-6
	Liability Covers the other person's insurance assuming you are the driver and you cause a crash **Property Damage** Covers the property damage of any vehicle involved except yours It also covers damage to other property caused by your vehicle such as fences, buildings, signs, etc.	T18-7

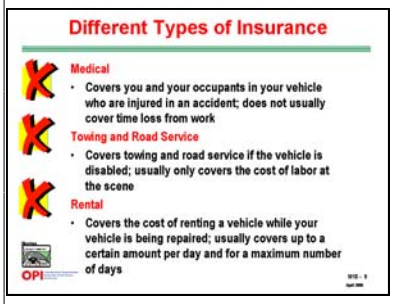
Student Learning Activities	Resources

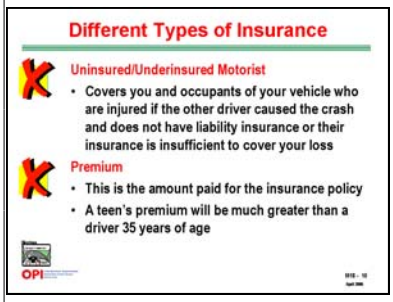


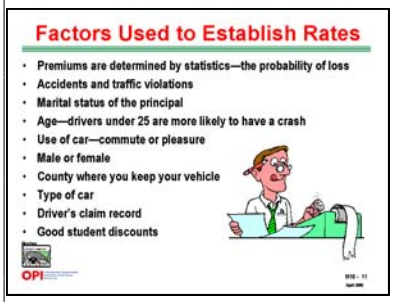
Instructional Topic	Content	Slide
AUTOMOBILE INSURANCE (Cont.)	**Bodily Injury** Covers expenses for injury to anyone involved in the crash other than you, up to the limit of coverage	
	Collision Covers the cost to repair damage to your vehicle if you are in a collision regardless of who caused the accident; a deductible usually applies	T18-8
	Comprehensive Covers the cost to repair damage to your vehicle by causes other than collision, such as fire, vandalism, theft of part or all of your vehicle, and colliding with a bird or animal; a deductible usually applies	
	Medical Covers you and your occupants in your vehicle who are injured in an accident; does not usually cover time loss from work	T18-9
	Towing and Road Service Covers towing and road service if the vehicle is disabled; usually only covers the cost of labor at the scene	
	Rental Covers the cost of renting a vehicle while your vehicle is being repaired; usually covers up to a certain amount per day and for a maximum number of days	
	Uninsured/Underinsured Motorist Covers you and occupants of your vehicle who are injured if the other driver caused the crash and does not have liability insurance or their insurance is insufficient to cover your loss	T18-10
	Premium This is the amount paid for the insurance policy • A teen's premium will be much greater than a driver 35 years of age <u>Example</u>: A 16-year-old female with no citations or accidents, driving a modest 10-year-old US made vehicle, living in a rural area will have lower premiums than a 16-year-old male with two speeding convictions, living in a metropolitan area	
	Factors used in establishing rates • Premiums are determined by statistics involving the probability of loss • Differences between "standard," "preferred," and "high-risk" companies • Accidents and traffic violations • Surcharges—dollar penalties added for accidents and certain traffic violations • Marital status of the principal driver—married drivers have fewer crashes than single drivers • Age—drivers under 25 are more likely to have a crash • Use of car—commute or pleasure	T18-11

Student Learning Activities	Resources



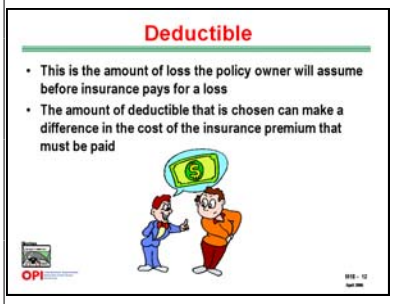


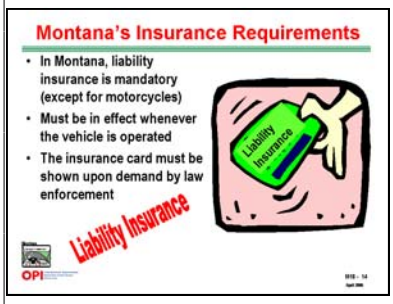


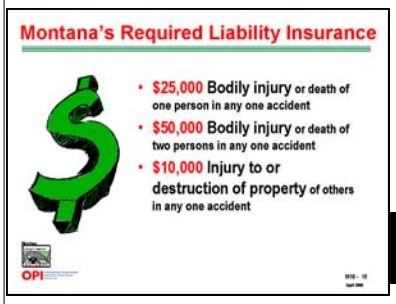


Instructional Topic	Content	Slide
AUTOMOBILE INSURANCE (Cont.)	• Sex of driver—men have more auto collisions than women — statistics show one in five males under the age of 20 will be involved in a collision • County where you keep your car — includes time and efficiency of police response, local roads and traffic conditions, quality of medical services, litigation rates • Type of car, safety damage ratings, theft rates, and repair costs • Driver's claim record • Good student discounts when the driver maintains a 3.0 or higher grade point average (GPA) • Coverage selected — if you have deductibles, collision, comprehensive, liability limits • Canceling policy before expiration — many companies charge a "short-rate" fee (usually a substantial amount) to cover cost for processing and cancellation • Other factors — credit history and premium payment record	
	Deductible This is the amount of loss the policy owner will assume before insurance pays for a loss • The amount of deductible that is chosen can make a difference in the cost of the insurance premium that must be paid <u>Example</u>: The vehicle sustains $1,000 in damage and your deductible is $100; you must pay the $100 and the insurance coverage would pay $900 • This $100 deductible could increase the premium as much as $300-$400 per month for a "muscle or sports" car with a high probability of crash • Foreign made vehicles may also cost more to insure because of their higher cost for repairing or replacement	T18-12
	Shopping Tips • Decide before shopping for insurance what coverage and deductibles are needed • Choose the highest affordable deductible to lower premium • Rates vary widely — ask several companies and agents for quotes for the same coverage • Ask what type company the agent is using to quote premiums • Answer questions truthfully — wrong information could result in an incorrect price quote and/or denial of coverage • Look into the company's financial strength and complaint index	T18-13
◆ **Montana's Insurance Requirements**	In Montana, liability insurance is mandatory (except for motorcycles) • This insurance must be in effect whenever the vehicle is operated ... The insurance card, issued by an insurance company, must be shown upon demand by law enforcement	T18-14
	Liability insurance must be no less than • $25,000 Bodily injury or death of one person in any one accident • $50,000 Bodily injury or death of two persons in any one accident • $10,000 Injury to or destruction of property of others in any one accident	T18-15

Student Learning Activities	Resources







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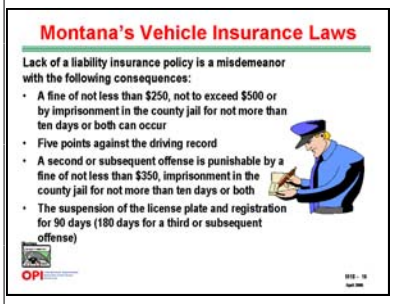
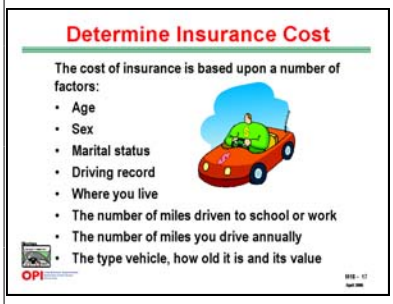
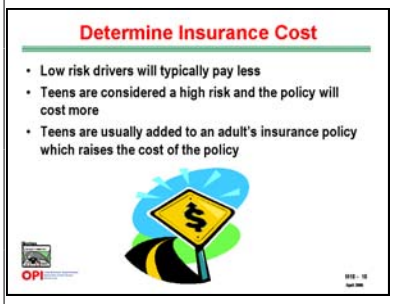
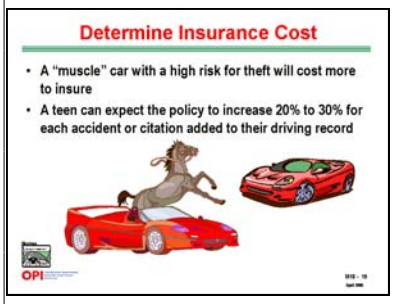
Instructional Topic	Content	Slide
◆ **Montana's Vehicle Insurance Laws**	Operation of a motor vehicle on Montana's roadways without a valid liability insurance policy is a misdemeanor with the following consequences • A fine of not less than $250, not to exceed $500 or by imprisonment in the county jail for not more than ten days or both can occur • Five points against the driving record • A second or subsequent offense is punishable by a fine of not less than $350, imprisonment in the county jail for not more than ten days or both • The suspension of the license plate and registration for 90 days (180 days for a third or subsequent offense) Owners of more than 25 vehicles registered in Montana may qualify for self-insurance • If a nonresident owner/operator is involved in any accident in Montana, proof of adequate insurance coverage by a company licensed to write insurance policies in Montana will be accepted • Nonresident owners or operators of a motor vehicle involved in any accident must comply with the law; failure to comply will result in their driving privileges in Montana being withdrawn	T18-16
◆ **Determine Insurance Cost**	The cost of insurance is based upon a number of factors: age, sex, marital status, driving record, where you live, the number of miles driven to school or work, the number of miles you drive annually, the type vehicle, how old it is and its value • Low risk drivers will typically pay less • Teens are considered a high risk and the policy will cost more ... Teens are usually added to an adult's insurance policy which raises the cost of the policy • If medical insurance is covered under a separate medical insurance policy, excluding this coverage can help reduce cost • A "muscle" car with a high risk for theft will cost more to insure • A teen can expect the policy to increase 20 percent to 30 percent for each accident or citation added to their driving record ... Accidents and citations typically stay on the driving record for a set number of years • If the citation or accident involves "Driving Under the Influence" (DUI) or "Minor in Possession" (MIP) or reckless driving, the same coverage could increase the premium three to five times higher per month ... As long as the citation or accident remains on the driving record, the higher premiums will have to be paid • If a vehicle is loaned to someone and they cause a crash, your vehicle insurance will most likely pay the claim and it will become part of your claim history • If a vehicle has a special paint job like flames, murals, five-layer paint with pearl, etc., it will probably require special coverage and increased premiums • If you are involved in street racing or participating in an organized racing event with the insured vehicle, any damage or injury that happens may be excluded from payment of claims	T18-17 T18-18 T18-19 T18-20

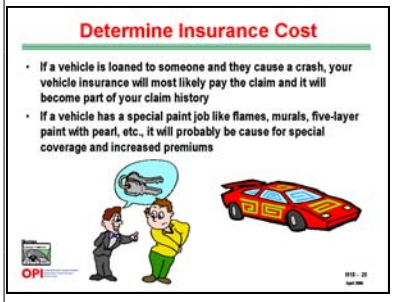
Student Learning Activities	Resources











Instructional Topic	Content	Slide
◆ **Denied or Revoked Insurance**	A policy is a contract between you and the insurance company • Understand the policy's coverage to settle claims satisfactorily • Read the *Consumer Bill of Rights* which must be included with the insurance policy, to understand rights and responsibilities • If a driver is involved in an accident, their license and registration can be suspended if found liable for damages in a court of law and failed to pay the fine within 60 days of the judgment • The suspension is automatic and remains in force until the judgment is paid or for the next six years ... Proof of motor vehicle insurance is required to reinstate a driver license and registration • If the vehicle is not insured, the driver will be given five "conviction" points on their driving record ... When 30 conviction points are earned within three years, the driver is considered a "habitual offender" and can be subject to jail time, license suspension for three years and a fine	T18-21 T18-22
	High Risk Drivers Each company has its own rules, called *underwriting guidelines*, for deciding whether to insure people The following factors may cause an insurance company to deny an application • Tickets and accidents • Owning a car built for speed • Driving record • Credit rating	T18-23
	Cancellation In the first 60 days, the insurance company can cancel for any lawful reason, including a ticket or an accident After the policy is in effect more than 60 days, *a company can cancel* for the following reasons, but must give notice before canceling, and refund the unused portion of the premium • Failure to pay premium • Filing a fraudulent claim • Driver's license is suspended or revoked (This also applies to other drivers who live with policyholder and customarily use policyholder's car)	T18-24 T18-25
	Non-Renewal Your insurance company can choose not to renew your policy for a variety of reasons • Insurance is a contract that can be terminated by either party • An insurance company must give you at least 30 days notice of non-renewal • It is unlawful for an insurance company to discriminate and refuse to renew a policy for certain reasons	T18-26

Student Learning Activities

Resources

Denied or Revoked Insurance

- If a driver is involved in an accident, his/her license and registration can be suspended if found liable for damages in a court of law and failed to pay the fine within 60 days of the judgment
- The suspension is automatic and remains in force until the judgment is paid or for the next six years

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Denied or Revoked Insurance

- If the vehicle is not insured, the driver will be given five "conviction" points on his/her driving record
- Then 30 conviction points are earned within three years, the driver is considered a "habitual offender" and can be subject to jail time, license suspension for three years and a fine

OPI

High Risk Drivers

- Each company has its own rules, called *underwriting guidelines*, for deciding whether to insure people
- The following factors may cause an insurance company to deny an application
- Tickets and accidents
- Owning a car built for speed
- Driving record
- Credit rating

OPI

Policy Cancellation

- In the first 60 days, the insurance company can cancel for any lawful reason, including a ticket or an accident
- After the policy is in effect more than 60 days, *a company can cancel* for the following reasons, but must give notice before canceling, and refund the unused portion of the premium
  - Failure to pay premium
  - Filing a fraudulent claim
  - Driver's license is suspended or revoked

  (This also applies to other drivers who live with policyholder and customarily use policyholder's car)

OPI

Insurance Cancellation

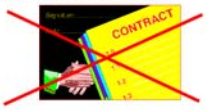
- Failure to pay premium
- Filing a fraudulent claim
- Driver's license is suspended or revoked

(This also applies to other drivers who live with policyholder and customarily use policyholder's car)

OPI

Non-Renewal of Policy

- Your insurance company can choose not to renew your policy for a variety of reasons
- Insurance is a contract that can be terminated by either party
- An insurance company must give you at least 30 days notice of non-renewal
- It is unlawful for an insurance company to discriminate and refuse to renew a policy for certain reasons



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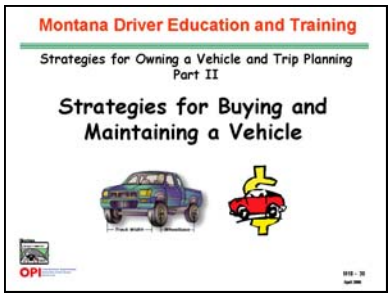
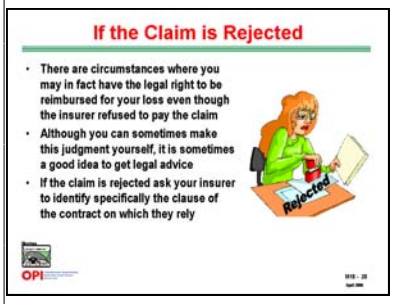
Instructional Topic	Content	Slide
◆ **Denied or Revoked Insurance (Cont.)**	• Your age, sex, residence, race, creed, national origin, ancestry, marital status, or lawful occupation (including military service) • Lack of driving experience or number of years driving • Lack of supporting business (such as homeowner's policy) • One or more violations or crashes that occurred more than 48 months before your policy's upcoming anniversary date • Because other companies canceled, refused to renew, or denied you coverage or you once purchased insurance through the assigned risk plan • One or more uninsured motorist claims where the uninsured motorist is an acquaintance or there is physical evidence of contact • A single not-at-fault claim filed under your medical expense benefits coverage • One or more claims filed under the comprehensive coverage or towing coverage • Two or less accidents within three years, unless the accident was wholly or partially the fault of the named insured, a resident of the same household, or another customary operator	T18-27
◆ **Report Damage to Insurance Agent/ Company**	To help policy holders make a claim, insurance companies have 24-hour help lines • After the call is made, expect to be sent an accident report form to complete • Make sure you keep all receipts and ensure that you photocopy any correspondence that is associated with your claim ... Your claim will be dealt with as swiftly and smoothly as possible if you provide the information your insurance company requires • Don't take your car in for repairs and hope they'll be paid for ... Your insurance provider may recommend you to a garage and you should take your car there ... The entire claims procedure will be much quicker and simpler if you follow your insurer's recommendations fully, and they can deal with the repairer directly ... Your insurer may also provide a courtesy car while your car is being repaired ... At the very least your insurer needs to approve an estimate from a mechanic before repairs can begin • Your insurers need to agree to pay your car's repair costs, and until then, any repair costs are your responsibility ... You should get written confirmation about the state of your claim before proceeding ... Remember that you will be required to pay the agreed level of excess even if your insurer will meet the repair costs, and this payment will normally be made directly to your mechanic	

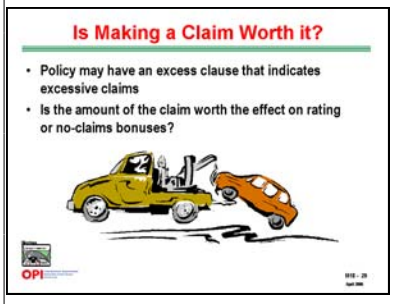
Student Learning Activities	Resources

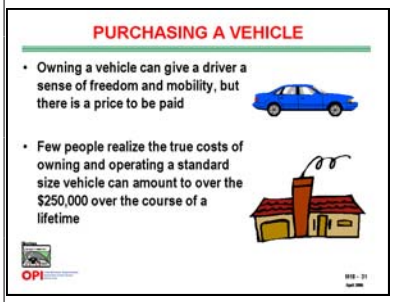
Instructional Topic	Content	Slide
◆ **Report Damage to Insurance Agent/ Company (Cont.)**	**If the claim is rejected?** There are circumstances where you may in fact have the legal right to be reimbursed for your loss even though the insurer refused to pay the claim • Although you can sometimes make this judgment yourself, it is sometimes a good idea to get legal advice.	T18-28
	Check the policy If the claim is rejected ask your insurer to identify specifically the clause of the contract on which they rely for denial	
	Is it worth the claim? Many types of insurance contracts will have an excess clause that deternines excessive claims • This is common in a car insurance contract, or you may lose part of the no-claims bonus	T18-29
	... At times you will have to decide whether the amount of the claim is worth the long-term loss that results from the effect on rating or no-claims bonuses, especially after taking into account the amount of the excess cost	T18-30
PURCHASING A VEHICLE	Owning a vehicle can give a driver a sense mobility and freedom, but there is a price to be paid • Few people realize the true costs of owning and operating a standard size vehicle can amount to over the $250,000 over the course of a lifetime • For many consumers, a new car is second only to a home as the most expensive purchase they will ever make	T18-31
	Vehicle purchase cost includes: • Monthly payments and interest • Insurance payments • Repair and maintenance expenses • Fuel mileage and costs • Registration fees	T18-32
	Before taking the first step toward ownership, know what you will need and the true cost to operate the vehicle • In its yearly "Your Driving Costs" study, the American Automobile Association (AAA) calculates what it costs to own and operate a vehicle for 10,000 miles of annual driving and five years of ownership before trading it in ... AAA says motorists pay an average of 68.9 cents a mile, or $6,890 a year, for a 2004 model car, up from 64.2 cents a mile, or $6,420 a year, for an '03 ... That takes into account gas, oil, maintenance and tires as well as insurance, depreciation, financing charges, license, title, taxes, registration and plates For full details of the AAA study, visit their Web site at: www.ouraaa.com/news/library/drivingcost/index.html.	T18-33

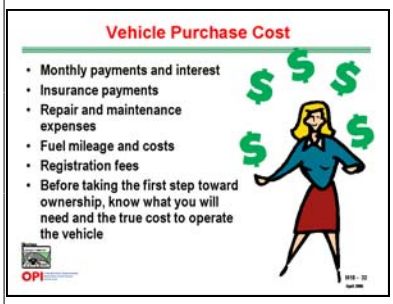
Student Learning Activities	Resources

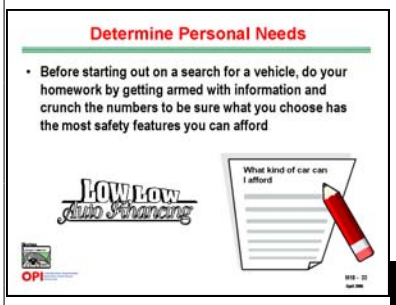












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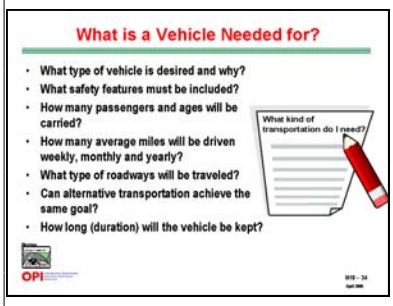
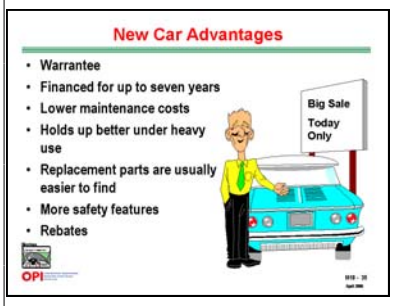
Instructional Topic	Content	Slide
◆ **Determine Personal Needs**	Before starting out on a search for a vehicle, do your homework by getting prepared with information and crunch the numbers to be sure what you choose has the most safety features you can afford • There is a wealth of information about new and used cars on the Internet • Libraries and book stores have publications that compare car models, options, and costs • After the car choices are narrowed, research the frequency of repairs and maintenance costs in consumer magazines • The U.S. Department of Transportation's Auto Safety Hotline (1-800-424-9393) gives information on recalls	
	What is needed? • What is the vehicle needed for? • What type of vehicle is desired and why? (Car, pickup, automatic or standard transmission, age) • Is the capability of towing a boat or trailer needed? • What safety features must be included? • How many passengers and ages will be carried? • How many average miles will be driven weekly, monthly, yearly? • What type of roadways will be traveled? • Can alternative transportation achieve the same goal? • How many years will the vehicle be kept?	T18-34
	New or used? Find a vehicle that fits your needs and wallet • Web sites offer a variety of opportunities to research vehicles and their cost; <u>Example</u>: http://www.edmunds.com	
	New car advantages Most new vehicles come with a warrantee • A written guarantee that the vehicle manufacturer or dealership will repair and/ or replace any defective parts or systems within a certain amount of time or miles driven • Most new vehicles come with a standard three year, or 36,000 mile warrantee for major parts • Extended warranties are available, but be sure you understand what you are buying; it may not be needed • New cars can be financed for up to seven years • Lower maintenance costs • Holds up better under heavy use or long-distance travel • Replacement parts are usually easier to find and less expensive • More safety features • Rebates — special payments to customers to encourage customers to purchase cars, generally at the end of the year or when the dealer wants to make room for new models	T18-35

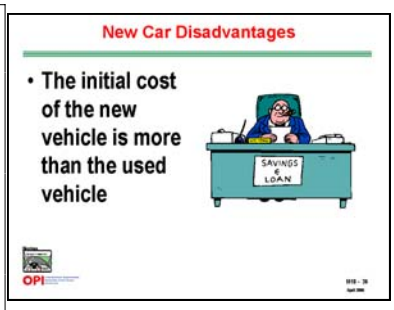
Student Learning Activities	Resources

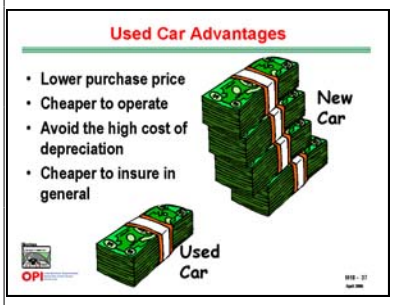


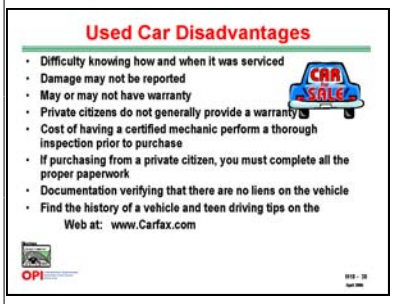


Instructional Topic	Content	Slide
◆ **Determine Personal Needs (Cont.)**	**New car advantages (Cont.)** The initial cost of the new vehicle is more than the used vehicle • List price means the manufacturer's suggested price as the vehicle is equipped from the factory ... Invoice cost is the cost the dealer pays for the vehicle • Sticker means the list price plus destination charges (fees to get the vehicle from the factory to your dealer) and any additional options and/or services the dealer installs • Preparation charges are included in the sticker price and include, but are not limited to tuning the vehicle, changing or adding oil, checking the emission system or other services • When the vehicle is paid in full, the years of potential service without car payments are substantial	T18-36
	New car disadvantages Depreciation is high the first few years of ownership • Depreciation is the decline in a vehicle's resale value over time • Depreciation is based on the condition of the vehicle, age, mileage, and optional equipment • Loan payments can continue for seven years and the vehicle will have aged seven years • Insurance cost will be higher • Taxes and vehicle registrations will cost more	
	Used car advantages • Lower purchase price • Cheaper to operate • Avoid the high cost of depreciation • Cheaper to insure in general	T18-37
	Used car disadvantages • Difficulty in knowing how and when it was serviced • Conditions under which the vehicle was driven are unknown • Damage may not be reported • May or may not have warranty ... Private citizens do not generally provide a warranty, but you may get the best price from a private citizen • Cost of having a certified mechanic perform a thorough inspection prior to purchase • If purchasing from a private citizen, you must complete all the proper paperwork: ... Bill of sale ... Release of liability form ... Odometer disclosure statement ... Transfer of title ... Documentation verifying that there are no liens (somebody is owed money and the money will come from the sale of the vehicle) on the vehicle • Find the history of a vehicle and teen driving tips on the Web at: www.Carfax.com	T18-38

Student Learning Activities	Resources



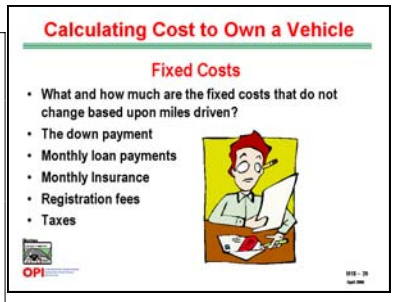


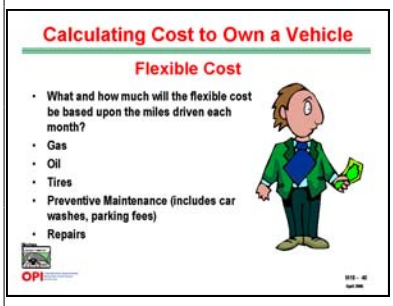


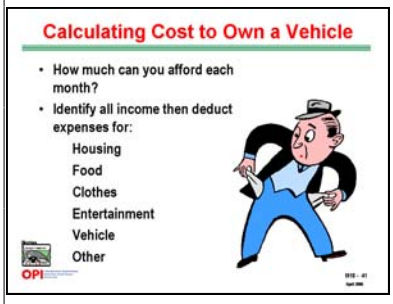
Instructional Topic	Content	Slide
◆ **Calculating Cost to Own a Vehicle**	What and how much are the fixed costs that do not change based upon miles driven? • Down payment • Monthly loan payments • Monthly Insurance • Registration fees • Tax	T18-39
	What and how much will the flexible cost based upon miles driven be each month? • Gas • Oil • Tires • Preventive Maintenance (include car washes, parking fees) • Repairs	T18-40
	How much can you afford each month? Identify all income then deduct expenses for: • Housing • Food • Clothes • Entertainment • Vehicle • Other	T18-41
	Is leasing a better alternative? Attractive advertisements say you can lease a new car for $259 a month or a truck for $200 — this can be tempting • Leasing a vehicle is like leasing an apartment; you pay a security deposit and monthly rental fees • Most leases are for two to four years **Advantages of leasing** • Low — or no — down payment • Lower monthly payments • Lower sales tax ... Tax is only paid on the amount of the car's value used — over three years this is half the amount of the car's total value • Lower out-of-pocket expenses to lease a car • Able to drive a more expensive car that would otherwise be unaffordable • May qualify as a business expense • Because the vehicle is new, maintenance costs should be lower the first three years • You may be able to buy the car for a previously agreed upon price	T18-42

Student Learning Activities

Resources

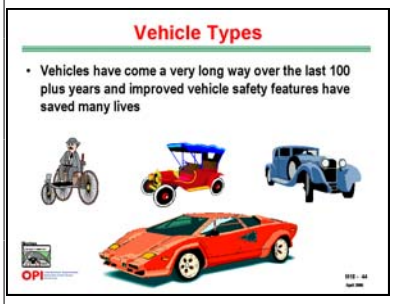


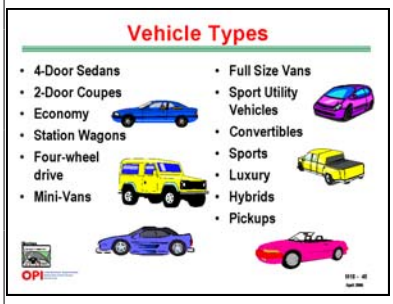


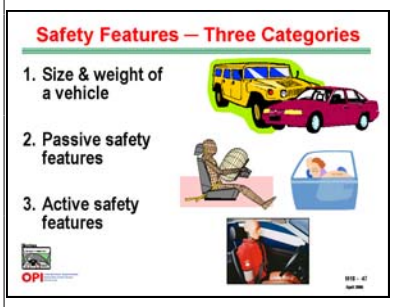


Instructional Topic	Content	Slide
◆ **Calculating Cost to Own a Vehicle (Cont.)**	**Disadvantages of leasing** Leasing can be more expensive than buying a vehicle • Security deposit • After the lease is completed, you will not have equity of ownership • A penalty may have to be paid for accumulating more miles than provided in the lease agreement • Terminating the lease early may incur penalties that can amount to thousands of dollars	T18-43
◆ **Vehicle Types**	Vehicles have come a very long way over the last 100 plus years and improved vehicle safety features have saved many lives	T18-44
	Vehicles come in a variety of sizes, types, and cost • 4-Door Sedans • 2-Door Coupes • Economy • Station Wagons • Four-wheel drive • Mini-Vans • Full Size Vans • Sport Utility Vehicles (SUVs) have grabbed most of the station wagon's customer base • SUVs are twice as big as a station wagon • Convertibles • Sports • Luxury • Pickup Trucks with more variations available than sedans ... Choices include engine, bed lengths, cab and door configurations • Hybrids	T18-45
◆ **Safety Features**	How well a vehicle protects its occupants from injury depends primarily on its structural design and safety systems • Safety belts are the single most important element, with air-bag systems providing additional protection • All vehicles have “crumple zones” in the front that are designed to collapse in a way that helps absorb the crash energy and minimize any deformation of the interior cabin ... The better the vehicle manages this energy, the less chance that occupants will suffer serious injury ... Tires are the most important safety item on a car	T18-46

Student Learning Activities	Resources







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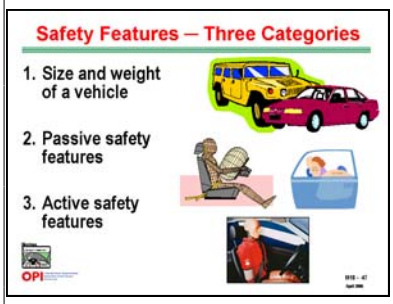
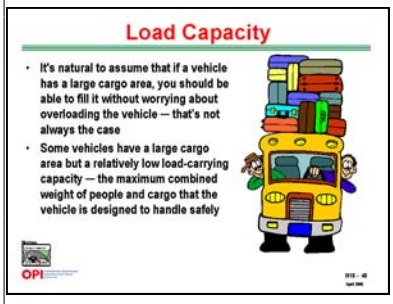
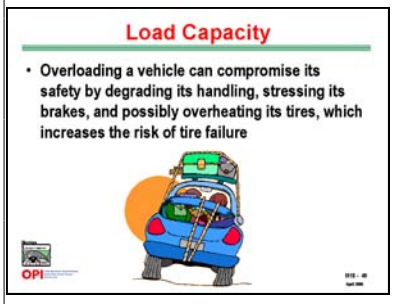
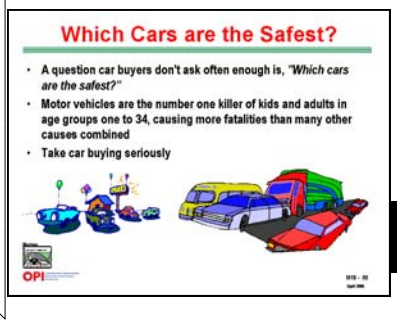
Instructional Topic	Content	Slide
◆ **Safety Features (Cont.)**	**Safety is divided into three categories** 1. **Size and weight** of a vehicle Larger and heavier cars are usually safer in a collision than smaller ones ... In relation to their numbers on the road, small cars account for more than twice as many deaths as large cars in a collision ... If a heavier vehicle collides head-on with a lighter one, the lighter vehicle and its occupants will suffer substantially more damage	T18-47
	2. **Passive safety** features help people stay alive and uninjured in a crash Passive safety features help drivers and passengers stay alive and uninjured in a crash ... Passive features include seat belts, air bags, head restraints and structural integrity ... The U.S. Department of Transportation requires that the doors and passenger compartments of automobiles made after 1996 meet minimal side impact standards; standards do not apply to light trucks, minivans, pick ups, or SUVs	
	3. **Active safety** features help drivers avoid accidents In the past few years significant accident-avoidance and safety systems have been introduced on many automobiles: ABS brakes, traction control, electronic stability control, night vision detection, and automatic cruise control are some of the electronic miracles that assist modern drivers today	
	Load capacity It's natural to assume that if a vehicle has a large cargo area, you should be able to fill it without worrying about overloading the vehicle, but that's not always the case	T18-48
	• Some vehicles have a large cargo area but a relatively low load-carrying capacity — the maximum combined weight of people and cargo that the vehicle is designed to handle safely ... Overloading a vehicle can compromise its safety by degrading its handling, stressing its brakes, and possibly overheating its tires, which increases the risk of tire failure	T18-49
	• Unfortunately, most auto manufacturers don't provide load-capacity specifications in a way that's easily accessible or understandable to the consumer	
	• A question car buyers don't ask often enough is, *"Which cars are the safest?"* ... Motor vehicles are the number one killer of kids and adults in age groups one to 34, causing more fatalities than many other causes combined; take car buying seriously	T18-50

Student Learning Activities	Resources









Instructional Topic	Content	Slide
◆ **Safety Features (Cont.)**	**Available safety features** Traction control • Improves traction and directional stability on slippery roads, using a combination of electronics, drive train control, and ABS • Skid prevention and control • Electronic stability ... Stability control is designed to help keep the vehicle under control and on its intended path during cornering, preventing sliding or skidding; it is especially helpful in slippery conditions or when a vehicle exceeds its handling limits due to an emergency situation • Cargo Nets and Hooks ... Unsecured objects can be deadly in a severe crash, even those in a trunk of a sedan ... If you frequently have items in your trunk or cargo area, secure them safely • Crumple zones ... A good structural design should have a strong occupant compartment (safety cage) and front and rear ends designed to buckle and bend in serious crashes to absorb crash force • Safety glass ... Keeps glass contained when shattered • Anti-lock brakes (ABS) ... Helps the driver maintain steering control of the vehicle during hard braking • Safety belts .... The best way to survive a crash, especially if used with airbags • Airbags, front and sides ... Smart airbags, next generation airbags occupant protection improvements • Head restraints ... A car's head restraints are vital for guarding against whiplash • Daytime running lights ... Oncoming vehicles are easier to see and be seen	T18-51
	• Ergonomics and Comfort ... Good controls layout and seats that provide good support ... Smaller drivers may appreciate the adjustable pedals offered in some vehicles • Interior trunk release ... To prevent someone from being locked in the trunk • Retractable steering column ... Reduces risk of injury by the column in a crash • Sliding door auto stop ... Prevents accidental door closure on a person • Night vision system ... A system that will detect any object 500 feet ahead and help drivers sense the speed of vehicles surrounding it	T18-52

Student Learning Activities	Resources

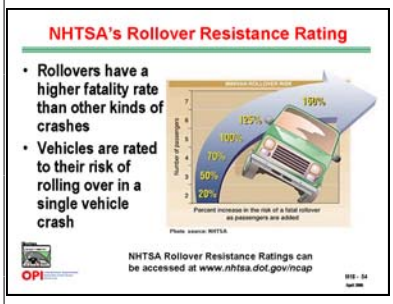
Instructional Topic	Content	Slide
◆ **Safety Features (Cont.)**	• Navigation systems such as *OnStar* ... Alerts emergency rescuers when an air bag deploys or the vehicle gets into a crash • Back up sensors ... Alerts if there is an object behind the vehicle ... Larger vehicles, such as SUVs, pickups, and minivans, have larger blind spots—the areas around a vehicle that the driver can't see ... Some SUVs and minivans now have a rear view video camera that gives the driver a wide-angle view of much of the area that's usually hidden in the blind spot • Heated side mirrors/with turn signals ... Keeps mirrors fog-free, increases visibility of turn signals • Radio/CD controls in the steering wheel ... Keeps the eyes on the road while adjusting the controls • Child safety seats ... Securing a child seat can sometimes be difficult ... All new vehicles now have a universal system Lower Anchors and Tethers for Children (LATCH) that makes attaching the child seat easier and more secure ... Some vehicles have attachments that are hard to access • Window switches ... Power windows can be accidentally activated in some vehicles and have caused serious injury or death to children ... Lever-type switches, which are flush with the surrounding trim and only raise the window when pulled up, are a safer design **New vehicle technology** While wearing a seat belt remains the best way to survive a crash, new technology could add more tools to make vehicles safer Technology has been successful in upgrading vehicle safety and now there is a shift of focus from crash protection toward preventing a crash • Continental Teves has worked with several automakers on "intelligent" systems that use radars to assess the potential danger of a crash, allowing a car to detect how quickly it's coming up on the vehicle in front of it and adjust its speed to avoid rear-ending it ... In the event of a potential crash, a signal or beep might warn a motorist, tighten the seat belt to put the person in a safer position, ready the brakes and instantly close the sunroof or windows to prevent someone from being thrown from the vehicle **Note**: a video of this intelligent system is included in this curriculum module	

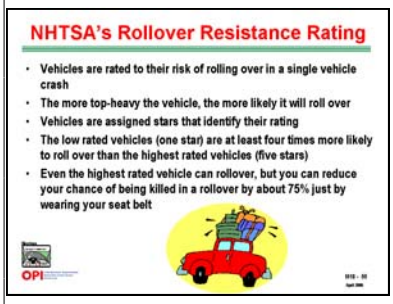
Student Learning Activities	Resources

Instructional Topic	Content	Slide
◆ **Safety Features (Cont.)**	• Government studies found stability control systems reduced single-vehicle sport utility crashes by 67 percent and one-car crashes by 35 percent compared to the same models sold in previous years without the technology • Adaptive cruise control allows a driver to maintain a safe following distance and adjusts its speed accordingly • A lane departure warning system that addresses the high number of fatalities when cars drift off the road or into other lanes • Electronic door locks that unlock to give easy access to emergency officials and the blower motor of the heating, ventilation and air conditioning system shuts off to prevent the potential for a fire • Consumers can compare vehicle safety features and their crash ratings ... The following Web sites offer consumers vehicle crash rating comparisons Insurance Institute for Highway Safety www.highwaysafety.org U.S. Dept of Transportation www.nhsa.dot.gov USAA Educational Foundation www.usaaedfoundation.org	T18-53
	National Highway Traffic Safety Administration's (NHTSA's) Rollover Resistance Rating Rollovers have a higher fatality rate than other kinds of crashes • Vehicles are rated on their risk of rolling over in a single vehicle crash • The vehicles are measured for their center of gravity and track width to determine how top heavy a vehicle is ... The more top heavy the vehicle, the more likely it is to roll over	T18-54
	• Vehicles are assigned stars that identify their rating ... The lowest rated vehicles (one star) are at least four times more likely to roll over than the highest rated vehicles (five starts)	T18-55
	• Even the highest rated vehicle can rollover, but you can reduce your chance of being killed in a rollover by 75 percent just by wearing your seat belt	T18-56

Five Stars	★★★★★	Has a risk of rollover of less than 10 percent
Four Stars	★★★★	Has a risk of rollover between 10 percent and 20 percent
Three Stars		Has a risk of rollover between 20 percent and 30 percent
Two Stars	★★	Has a risk of rollover between 30 percent and 40 percent
One Star	★	Has a risk of rollover greater than 40 percent

Student Learning Activities	Resources





Instructional Topic	Content	Slide
◆ Safety Features (Cont.)		

Example:

Dodge Durango 2004	4x2	★★★
	4x4	★★★★
GMC Jimmy 4 Dr	4x2	★
	4x4	★★

NHTSA Rollover Resistance Ratings can be accessed at www.nhtsa.dot.gov/ncap

Choosing a safer car

SafeCarGuide.com evaluates all the available data on a specific vehicle and assigns it one of five possible performance ratings based on data contained in 12 categories

- The overall rating is not simply an average of the other scores, because certain categories count more from a safety point of view
  ... The most significant safety determinant, worth as much as all the others put together, is **WEIGHT** — T18-57

Overall Ratings Based On Safety

Blue: Excellent Safety - Highly Recommended

Green: Good Safety - Recommended

Yellow: Acceptable But Better Choices Exist - Not Recommended

Red: Marginal Safety - Unacceptable — T18-58

Black: Poor Safety - Unacceptable

Weight Class Categories — T18-59

Keep in mind that crash test results aren't comparable between vehicles with large weight differences (more than 15 percent)

- That's why the vehicles are put into five distinct weight categories

Blue: 3,500 lbs / 1,590 kgs or more

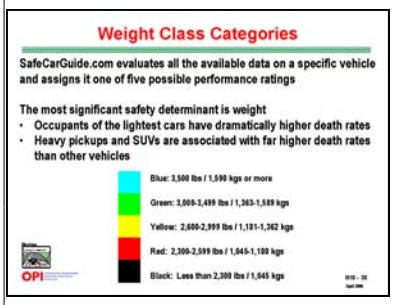
Green: 3,000-3,499 lbs / 1,363-1,589 kgs

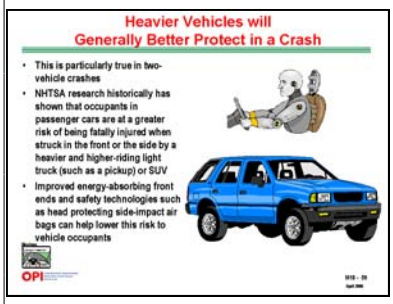
Yellow: 2,600-2,999 lbs / 1,181-1,362 kgs

Red: 2,300-2,599 lbs / 1,045-1,180 kgs

Black: Less than 2,300 lbs / 1,045 kgs

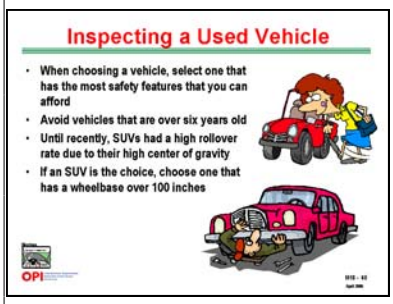
Student Learning Activities	Resources

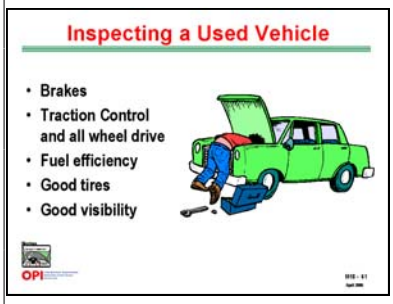




Instructional Topic	Content	Slide
◆ **Safety Features (Cont.)**	The Insurance Institute for Highway Safety purchases and tests vehicles for their crash worthiness www.highwaysafety.org • Heavy pickups and SUVs are associated with far higher death rates compared to heavy cars	
◆ **Inspecting a Vehicle**	**Choosing a vehicle — some considerations** When choosing a vehicle, select one that has the most safety features that you can afford • Avoid vehicles that are over six years old because they do not offer the crash protection of newer cars such as crush zones, better safety designs, anti-lock brakes and airbags • Until recently, SUVs had a high rollover rate due to their high center of gravity; newer SUVs have been built to help fix the problem; older SUVs have a high risk for rollovers ... If an SUV is the choice, choose one that has a wheelbase over 100 inches • Brakes need to stop the vehicle in the shortest distance possible • Traction Control and all wheel drive ... These features can improve traction in poor weather or off-road conditions ... They are very useful in areas with significant snowfall and poor snow removal, or for those who frequently use their vehicles off-road • Fuel efficiency ... Can make the difference between affording one vehicle over another; new vehicles have a window sticker with estimated fuel economy for both city and highway driving ... Keep in mind that driving habits alone can affect mileage by more than 25 percent • Good tires ... Quality tires can improve stopping distance, especially in poor weather • Good visibility ... The design of the windows and pillars can cause serious blind spots in some vehicles ... Seating position can affect visibility • The Web is a gold mine of information to help buyers make informed choices; here are a few www.Crashtest.com www.Smartmotorist.com www.Smartcarguide.com	T18-60 T18-61

Student Learning Activities	Resources



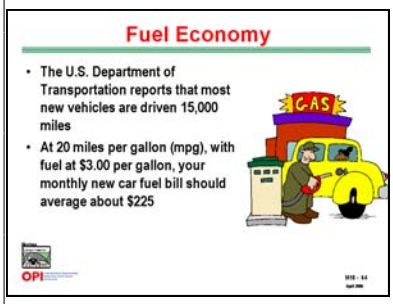


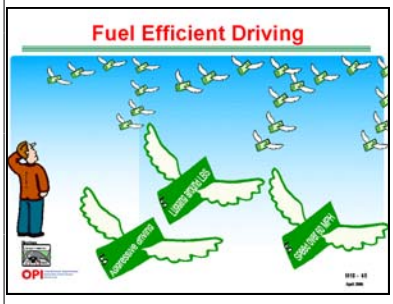
Instructional Topic	Content	Slide
◆ **Choosing a Vehicle (Cont.)**	• Make sure all oral promises are written into the Buyers Guide • You have the right to see a copy of the dealer's warranty before you buy • Warranties are included in the price of the product; service contracts cost extra and are sold separately • Ask for the car's maintenance record from the owner, dealer, or repair shop • Test drive the car on hills, highways, and in stop-and-go traffic • Have the car inspected by a mechanic you hire • Check out the dealer with local consumer protection officials • If possible, talk to the previous owner • If you buy a car "as is," you'll have to pay for anything that goes wrong after the sale	
◆ **Inspect a Used Vehicle**	**Tips for Inspecting a Used Vehicle** Whether buying a used car from a dealer, friend, neighbor, or family member, follow these tips and learn as much as you can • Create an inspection checklist; many are available in magazines, books and on the Web • Check out the car's repair record, maintenance costs, and safety and mileage ratings in consumer magazines or online • Look up the "blue book" value, and be prepared to negotiate the price using this Web site: www.kkb.com	T18-62 T18-63
◆ **Fuel Economy**	**Fuel economy** The US Department of Transportation reports that most new vehicles are driven 15,000 miles each year • Combine that with an average mileage of 20 mpg, with fuel at $3.00 per gallon, and your monthly new car fuel bill could average about $225 per month An SUV or large pickup can double fuel expenditure • Check a vehicle's fuel economy at this Web site http://www.fueleconomy.gov/mpg/MPG.do?action=browseList **Do the Miles Per Gallon (MPG) math** City drivers inevitably get worse fuel mileage as a result of their stop and go traffic, hence the distinction between "city" and "highway" mpg estimates on the window sticker • When you think about buying a car, combine the sky-high cost of fuel with the manufacturer's lowest mpg numbers, and you'll have some idea what to expect at the gas station	

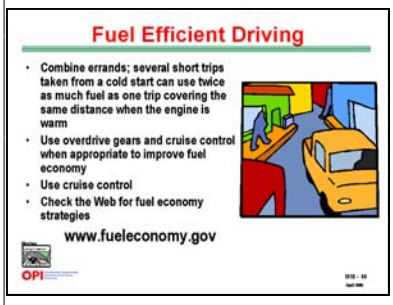
Student Learning Activities	Resources

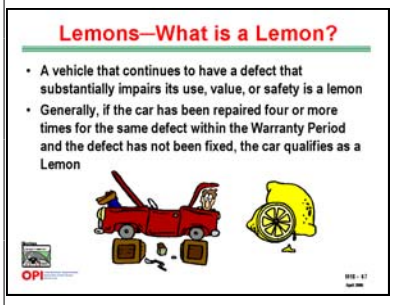
Instructional Topic	Content	Slide
◆ **Fuel Efficient Driving**	**Fuel efficient driving** Aggressive driving such as speeding, rapid acceleration and braking, wastes gas • It can lower gas mileage by 33 percent at highway speeds and by five percent around town • Avoid keeping unnecessary items in the vehicle, especially heavy ones ... An extra 100 pounds could reduce mpg by up to two percent • While each vehicle reaches its optimal fuel economy at a different range of speeds, gas mileage usually decreases rapidly at speeds above 60 mph ... As a rule of thumb, you can assume that each five mph you drive over 60 mph is like paying an additional 21 cents per gallon for gas • Combine errands; several short trips taken from a cold start can use twice as much fuel as one trip covering the same distance when the engine is warm • Use overdrive gears and cruise control when appropriate to improve fuel economy • Check the Web for fuel economy strategies www.fueleconomy.gov	T18-64 T18-65 T18-66
◆ **Lemons**	**What is a lemon?** A vehicle that continues to have a defect that substantially impairs its use, value, or safety is a lemon • Generally, if the car has been repaired four or more times for the same defect within the Warranty Period and the defect has not been fixed, the car qualifies as a lemon **Montana's Lemon Law** • If the consumer had repairs four or more times during the warranty but the problem continues to exist • If the vehicle is out of service for a cumulative total of 30 or more business days during the warranty period after notification of the manufacturer, agent, or dealer • This law applies to a vehicle that is less than two years old and with 18,000 miles or less on its odometer. • The Lemon Law covers new or demonstrator motor vehicles, including trucks of 10,000 lbs. or less gvw that are purchased or leased in Montana • Trucks over 10,000 lbs. gvw, non-motorized and off-road vehicles, motorcycles and the "residential" portion of motor homes are not covered under the Montana Lemon Law **If the vehicle turns out to be a "lemon"** Refers to various state laws protecting consumers against the purchase of vehicles found to be persistently defective • All states have lemon laws but they are not all the same; this Web site identifies each state's lemon law http://www.lemonlaw.com/automobile-lemon-law.html	T18-67 T18-68

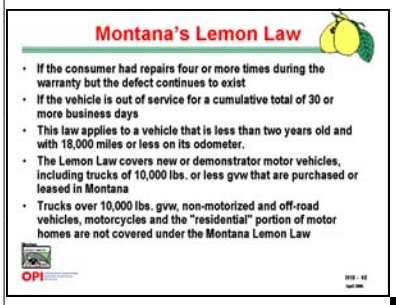
Student Learning Activities	Resources





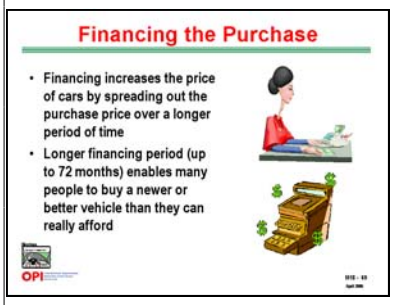


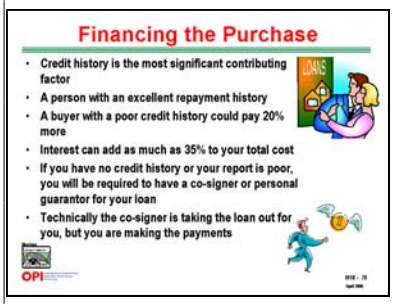




Instructional Topic	Content	Slide
◆ **Lemons (Cont.)**	• The Federal Trade Commission (FTC) works toward preventing and halting private and public measure that injure consumers, the agency's Web site is http://www.ftc.gov **Consumer Rights** If the manufacturer fails to correct any substantial defect or condition following your written notification, the manufacturer must either refund the full purchase price-plus any reasonable expenses directly incurred because of the vehicle's condition-or provide an identical or reasonably equivalent replacement vehicle • If the vehicle is bought back, the manufacturer can deduct an amount for the use of the vehicle calculated on the odometer reading at the time of repurchase **MVA 61-4-504. Reasonable number of attempts -- presumption.** A reasonable number of attempts to conform a new motor vehicle to the applicable express warranties is presumed to have been made for purposes of 61-4-503(1) if: (1) the same nonconformity has been subject to repair four or more times by the manufacturer or its agent or authorized dealer during the warranty period but the nonconformity continues to exist; or (2) the vehicle is out of service because of nonconformity for a cumulative total of 30 or more business days during the warranty period after notification of the manufacturer, agent, or dealer	
◆ **Financing the Purchase**	**Borrowing Money** Financing a purchase contributes to the high price of cars by spreading out the purchase price over a longer periods of time • Longer financing period (60 and 72 month loans are common) enable many people to buy a newer or better vehicle than they could otherwise afford ... This long-term financing includes more interest payments than shorter terms • Lenders will want work experience, history of previous residences, history of good credit ... Banks calculate the ability to borrow by looking at how much debt to income ratio; they look for 40 percent or lower	T18-69
	Interest Many factors beyond your control affect the basic interest rates, but your credit history is the most significant contributing factor • A person with an excellent repayment history (no late payments) is considered a good credit risk ... Another person buying a similar vehicle could pay as much as 20 percent if their credit history is poor • Interest can add as much as 35 percent to your total cost • If you have no credit history or your report is poor, you will be required to have a co-signer or personal guarantor for your loan ... Technically the co-signer is taking the loan out for you, but you are making the payments.	T18-70

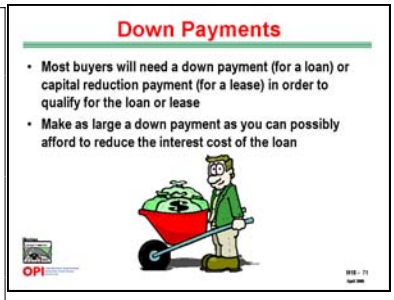
Student Learning Activities	Resources

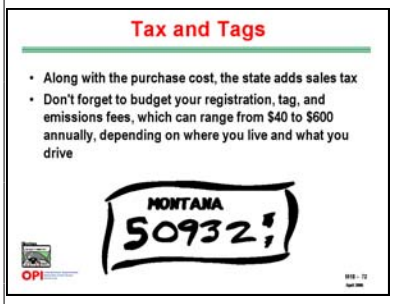




Instructional Topic	Content	Slide
◆ **Financing the Purchase**	**Down Payments** Most buyers will need a down payment (for a loan) or capital reduction payment (for a lease) in order to qualify for the loan or lease • Make as large a down payment as you can possibly afford to reduce the interest cost of the loan	T18-71
	Tax and License Plates Along with the purchase cost, other states may add sales tax (MT does not) • Don't forget to budget your registration, tag, and emissions fees, which can range from $40 to $600 annually, depending on where you live and what you drive	T18-72
◆ **Title and Registration**	**Title and Registration** Obtain the Title and Registration receipt from the seller • The title must be signed by all registered owners and all signatures must be notarized • The odometer reading must be recorded by the seller on the title or in a separate statement required for all motor vehicles nine years old or newer • Be very sure liens have been paid and released • Very important to obtain the last registration receipt ... Back taxes or fees can be charged to the purchaser if a current registration can't be produced • Always compare the Vehicle Identification Number (VIN) which appears on the title with the number stamped or affixed to the vehicle ... If the two numbers do not agree, do not complete the purchase until legal ownership is verified • Application for a new Title and Registration must be made to the county treasurer of residence within 20 days ... Failure to make application within the 20 day grace period subjects the transferee to a penalty • When purchasing from a car dealer, the dealer will send all documents to the county treasurer within four working days from the date of sale	T18-73
	Motor Vehicle Registration All motor vehicles and all trailers must be registered • Application is made at the county treasurer of residence • The previous year's registration receipt or your renewal card notice must be presented when registering motor vehicles • Registration application is made by a nonresident, when residence is established or becomes gainfully employed • A copy of the registration certificate must be kept when registering motor vehicles • The registration is your receipt and record of property tax or vehicle license fee paid to the county	T18-74

Student Learning Activities	Resources





Instructional Topic	Content	Slide
◆ License Plates	**License Plates** Plates are issued by the county treasurer where your vehicle is subject to tax or fee for one year, 24 months, or permanent depending on year of vehicle • Anniversary months are assigned according to the month which the vehicle is first registered and is identified by the decal on the license plate • Vehicles are licensed by a non-staggered system - trucks exceeding 10,000 lbs. gvw, amateur radio, disabled veterans, trailers, semi-trailers, tractors, buses, motorcycles, boats, off-highway vehicles and special mobile equipment ... The expiration date is December 31 and must be renewed by February 15 • Motor homes and travel trailers expire annually on April 30, and must be renewed by June 15 • Snowmobiles expire June 30 annually and must be renewed by August 15 • All license plates stay with the owners; it is their responsibility to remove them • Plates may be transferred to another vehicle only when proper application is made through the county treasurer • A vehicle may be operated without plates for a 20-day grace period, before registration, by displaying a 20 day permit issued by a dealer, if purchased from a dealer, or a vehicle purchase permit issued by the county treasurer and participating law enforcement agencies if purchased from an individual • Renewal Notice is mailed for vehicles on the staggered system • Failure to receive the renewal notice does not relieve the owner of renewal responsibility	T18-75
	Registration and license plate fees **MCA 61-3-321** • Motor vehicles weighing 2,850 lbs. and under ..... $13.75 • All passenger cars weighing over 2,850 lbs. and all trucks ..... $18.75 • Personalized license plates, $25 in addition to other fees, $10 for renewal or transfer to another vehicle Must be renewed by end of grace period or plate will be available to another requesting such plate • Motorcycles ..... $ 9.75 • Trailers 2,500 lbs. gvw ..... $ 8.25 • Trailers over 2,500 lbs. up to 6,000 lbs. ..... $11.25 • Trailers over 6,000 lbs. gvw ..... $16.25 • Travel trailers $11.75	T17-76
MAINTAINING A VEHICLE	Breakdowns and costly repairs can be avoided by keeping an eye on some basic car components • Be alert to sounds, smells and sights that could indicate a problem	T18-77

Student Learning Activities	Resources

License Plates

- Plates are issued by the county treasurer
- Plates expire December 3—renew by February 15
- All license plates stay with the owners; it is their responsibility to remove them
- Plates may be transferred to another vehicle only when proper application is made through the county treasurer
- A vehicle may be operated without plates for a 20-day grace period, before registration, by displaying a 20-day permit
- Renewal notice is mailed
- Failure to receive the renewal notice does not relieve the owner of renewal responsibility

OPI

Registration and License Plate Fees

- MCA 61-3-321
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- Trailers over 6,000 lbs. GVW $16.25
- Travel trailers $11.75

OPI

MAINTAINING A VEHICLE

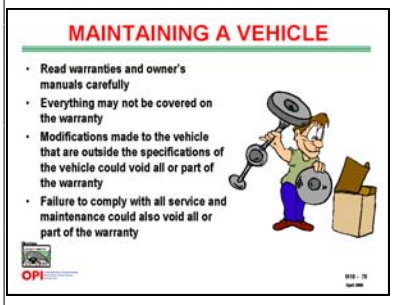
- Breakdowns and costly repairs can be avoided
- Be alert to sounds, smells and sights that could indicate a problem
- Regular maintenance and simple service can reduce the cost of vehicle ownership
- For maximum fuel efficiency and cleaner air, keep the engine in tune
- For safer driving, keep the brakes, steering and suspension systems in excellent condition

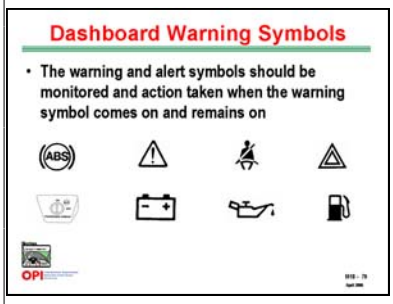
OPI

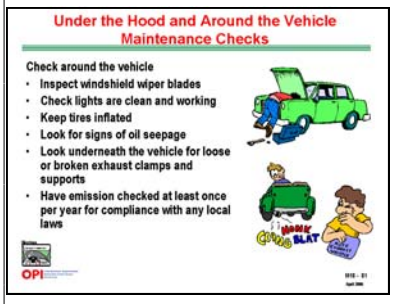
M18

Instructional Topic	Content	Slide
MAINTAINING A VEHICLE (Cont.)	Regular maintenance and simple service can reduce the cost of vehicle ownership • For maximum fuel efficiency and cleaner air, keep the engine in tune • For safer driving, keep the brakes, steering and suspension systems in excellent condition • Read warranties and owner's manuals carefully ... Everything may not be covered on the warranty ... Modifications made to the vehicle that are outside the specifications of the vehicle could void all or part of the warranty ... Failure to comply with all service and maintenance could also void all or part of the warranty	T18-78
◆ **Dashboard Warnings**	As discussed previously, the warning and alert symbols should be monitored and action taken when the warning symbol comes on and remains on • See Module 16, section on Dashboard Warning Symbols	T18-79
◆ **Under the Hood and Around the Vehicle Maintenance Checks**	Most of the quick and easy checks and services can be done at little or no cost • Always refer to the owner's manual when performing any maintenance task on your vehicle • Periodically your car should have a thorough inspection by a qualified technician **Perform under the hood checks** • Check the antifreeze/coolant level weekly • Inspect belts and hoses monthly • Check transmission fluid monthly with engine warm and running, and parking brake on • Check oil every other fill up • Check the air filter every other month	T18-80
	Check brake fluid monthly • Keep windshield washer fluid reservoir full. When topping off, use some windshield washer fluid on a rag to clean off the wiper blades ... In winter months, pay attention to the freezing point of the washer fluid • Check the battery with every oil change • Check power steering fluid level once per month **Check around the vehicle** • Inspect windshield wiper blades whenever you clean your windshield • Be sure all your lights are clean and working, including brake lights, turn signals and emergency flashers • Keep tires inflated to recommended pressure (it helps to own your own gauge) • Look for signs of oil seepage on shock absorbers • Look underneath for loose or broken exhaust clamps and supports • Have emission checked at least once per year for compliance with any local laws	T18-81

Student Learning Activities	Resources

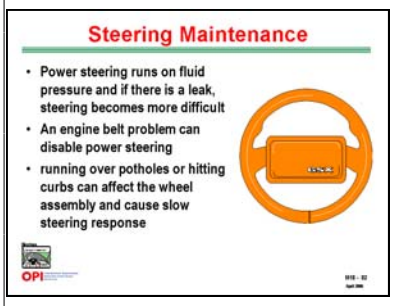


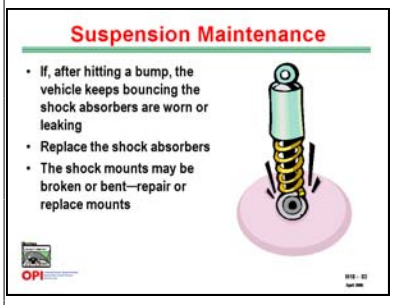


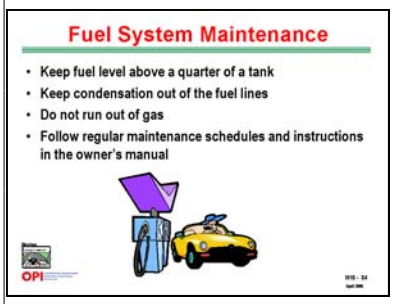


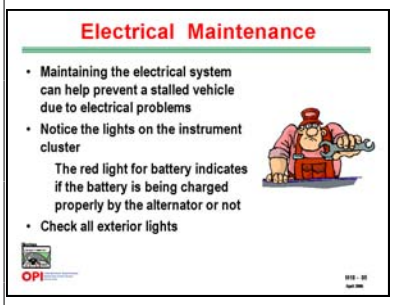
Instructional Topic	Content	Slide
Maintenance of the Steering, Suspension, Fuel, Electrical, Lighting, and Braking Systems	**Steering** The steering wheel is powered by the vehicle's hydraulics, belts and gears • Power steering uses the power of the engine to help turn the drive wheels in response to the movement of the steering wheel — it makes turning an effortless job • Power steering runs on fluid pressure and if there is a leak, steering becomes more difficult • An engine belt problem can disable power steering • running over potholes or hitting curbs can affect the wheel assembly and cause slow steering response	T18-82
	Suspension Shocks and struts dampen the movement of the wheels as they roll over ruts and potholes in the street making the ride smoother and more comfortable — and the ride safer • Their most important job is keeping the wheels on the road where they belong • If after hitting a bump the vehicle keeps bouncing the shock absorbers are worn or leaking ... Replace the shock absorbers; the shock mounts may be broken or bent — repair or replace mounts	T18-83
	Fuel The fuel system regulates the amount of fuel and air to the engine • To prevent clogged fuel system components, have the fuel system professionally cleaned when there is a decline in performance or fuel economy • Keep the vehicle's fuel system in good shape with these tips ... Keep fuel level above a quarter of a tank ... Keep condensation out of the fuel lines ... Do not run out of gas ... Follow regular maintenance schedules and instructions in the owner's manual	T18-84
	Electrical Maintaining the electrical system can help prevent a stalled vehicle due to electrical problems • The easiest and best way to prevent problems is to notice the lights on the instrument cluster ... Read the owner's manual carefully about the electrical system ... The red light for battery indicates if the battery is being charged properly by the alternator or not ... There can be several reasons for a battery not providing current properly: defective wiring, deposits in the terminal, defective alternator and belt and/or a defective battery	T18-85
	Lights Check all exterior lights (headlights, taillights and turn signals) on a regular basis and clean them every time you get gas	

Student Learning Activities	Resources



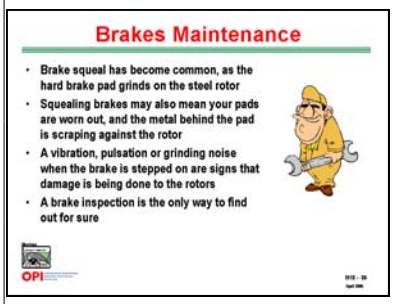


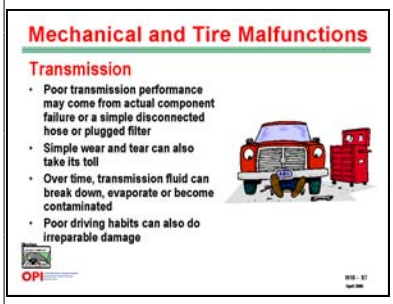


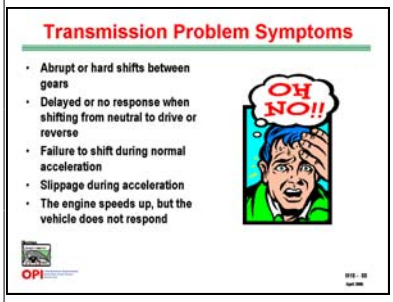


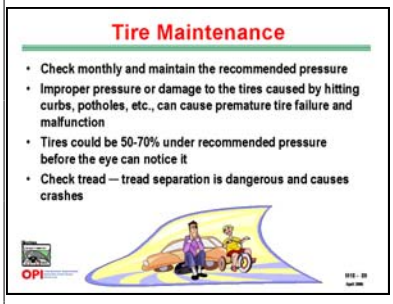
Instructional Topic	Content	Slide
◆ **Maintenance of the Steering, Suspension, Fuel, Electrical, Lighting, and Braking Systems (Cont.)**	**Brakes** Most brake pads now are made of hard, semi-metallic materials • One result is that brake squeal has become common, as the hard brake pad grinds on the steel rotor • Squealing brakes may also mean your pads are worn out, and the metal behind the pad is scraping against the rotor ... Replace pads as soon as they wear down • A vibration, pulsation or grinding noise when the brake is stepped on are signs that damage is being done to the rotors • A brake inspection is the only way to find out what needs to be repaired	T18-86
◆ **Mechanical and Tire Malfunctions**	**Transmission** Poor transmission performance may come from actual component failure or a simple disconnected hose or plugged filter • Simple wear and tear can also take its toll on the transmission • Over time, transmission fluid can break down, evaporate or become contaminated with metal particles ... This causes improper lubrication and gears can grind and wear • Poor driving habits can also do irreparable damage to the transmission such as shifting into reverse without bringing the car to a complete stop or failing to use a lower gear for hard pulling or climbing steep grades • Some of the most common symptoms of transmission problems are ... Abrupt or hard shifts between gears ... Delayed or no response when shifting from neutral to drive or reverse ... Failure to shift during normal acceleration ... Slippage during acceleration The engine speeds up, but the vehicle does not respond • Have a qualified mechanic check and repair • Check the transmission fluid level on a regular basis and change the fluid as specified in the owner's manual in order to extend the transmission life	T18-87 T18-88
	Tire Maintenance Check tire pressure monthly and maintain the recommended pressure listed in the owner's manual — do not rely on sight as this is usually inaccurate • Improper pressure or damage to the tires caused by hitting curbs, potholes, etc., can cause premature tire failure and malfunction • Tires could be 50-70 percent under recommended pressure before the eye can notice it • The recommended pressure may also be located on a sticker posted on the door post, trunk or glove box ... Use a good tire pressure gauge and a tread depth gauge to maximize tire life ... Check the tires after the car has not been driven for several hours	T18-89

Student Learning Activities	Resources



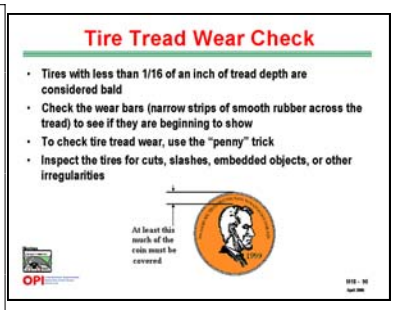


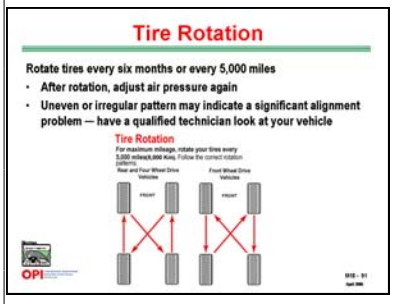


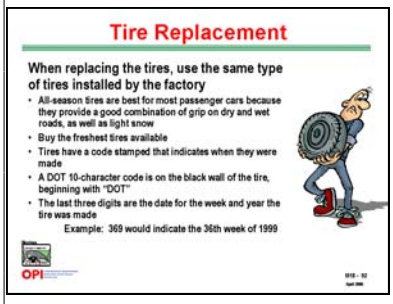


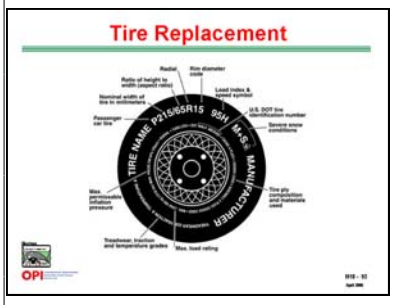
Instructional Topic	Content	Slide
◆ **Mechanical and Tire Malfunctions**	• Check tread — tread separation is dangerous and causes crashes ... Tires with less than 1/16 of an inch of tread depth are considered bald • Check the wear bars (narrow strips of smooth rubber across the tread) to see if they are beginning to tire wear • To check tire tread wear, use the "penny" trick ... Insert a penny into the tread ... If you can see all of Abe Lincoln's head, it's time to replace the tires • Inspect the tires for cuts, slashes, embedded objects, or other irregularities	T18-90
	• Rotate tires every six months or every 5,000 miles — for maximum wear and tear • Check owner's manual or tire manufacturer for proper rotation pattern • After rotation, adjust air pressure again • If the tires are wearing in an uneven or irregular pattern, there may be a significant alignment problem — have a qualified technician look at your vehicle	T18-91
	• When replacing the tires, use the same type of tires installed in the factory • All-season tires are best for most passenger cars because they provide a good combination of grip on dry and wet roads, as well as light snow	T18-92
	Purchasing Tires When it's time to purchase new tires, buy the freshest tires available because tires can harden and crack with age	T18-93
	• Tires have a code stamped that indicates when they were made • A DOT 10-character code is on the black wall of the tire, beginning with "DOT" • The last three digits are the date for the week and year the tire was made Example: 369 would indicate the 36th week of 1999	T18-94
	• The federal government has a "Uniform Tire Quality Grading System" that is also molded into the tire sidewalls and the rating indicates how long the tires will last ... A rating of 300-400 is considered good; 500-700 is very good • Tires are rated for traction and how well the tire will stop on a wet surface • Grades of AA, A, B, and C are used • Purchase tires with a traction rating of AA or A	T18-95
PLANNING A TRIP	A trip can be a routine trip to and from school, or work, to a store, or to visit friends and relatives • The routes are typically well known; alternate routes are known	T18-96
	• An extended trip requires preparation to ensure the trip is enjoyable and stress free • The routes must be determined • The basic costs for fuel, lodging, meals, and perhaps entertainment must be determined	T18-97
	Planning an Extended Trip While certain checks should always be made before driving, preparing for an extended trip of several days, some of which will likely be over high speed highways, requires extra preparation	

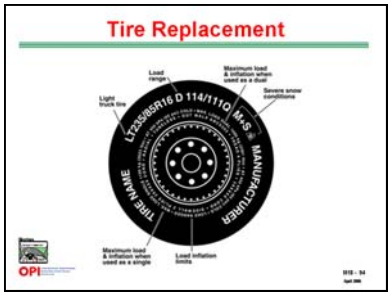
Student Learning Activities	Resources

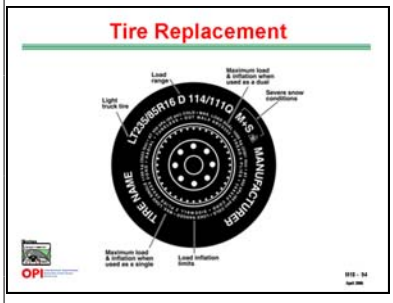








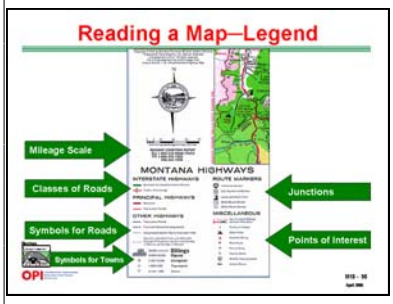


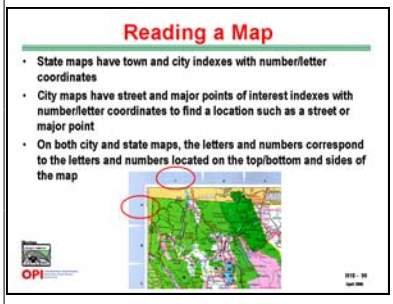


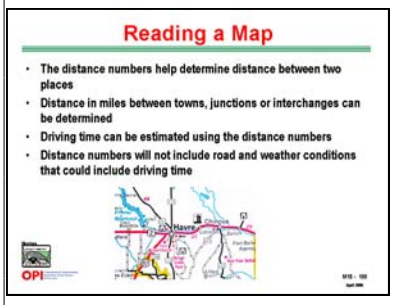
M18

Instructional Topic	Content	Slide
◆ **Reading a Map**	Maps are available from state and city offices, motor clubs, bookstores, the Internet, and many service station • Whether planning a trip out of state or trying to locate an address in a nearby city or your own home town, use a map to determine the best way to get there ... Sudden braking and/or lane changes when drivers realizes that he/she is about to miss a turn has contributed to many crashes	
	Map features Maps typically contain a chart or legend that explains the markings and symbols • Different colors and width of lines identify classes of roads (Interstates, two-lane, four-lane, divided and undivided, unpaved, scenic, under construction) • Symbols for federal, state, secondary, and county roads • Points of interest • Symbols show junctions and interchanges that help drivers move from one route to another • Black and red numerals to indicate mileage between major points • Identification of rest areas • Toll roads and service areas • Airports • Campground facilities • Symbols for cities and towns of a given population • Scale of miles • Maps of large cities embedded within the map	T18-98
	State maps have town and city indexes with number/letter coordinates • City maps have street and major points of interest index with number/letter coordinates to find a location such as a street or major point • On both city and state maps, the letters and numbers correspond to the letters and numbers located on the top/bottom and sides of the map	T18-99
	Distance numbers help determine how far apart two places are • Distance in miles between towns, junctions or interchanges can be determined • Driving time can be estimated using the distance numbers ... Distance numbers will not include road and weather conditions that could include driving time	T18-100

Student Learning Activities	Resources



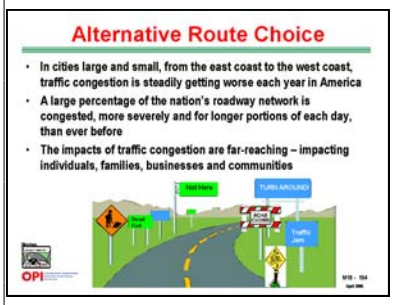


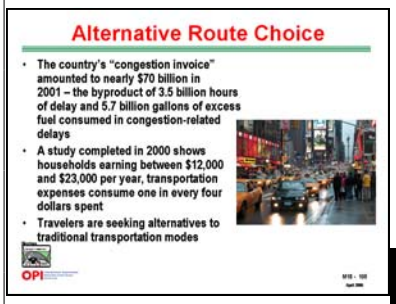


M18

Instructional Topic	Content	Slide
◆ **Technology Resources for Trip Planning**	Travelers today can receive directions to their destinations in their vehicles on handheld computers or by using devices incorporated into their dashboards • Prior to the popularity of the Web, road maps were the primary navigational source • Maps are often provided free by state or local tourism agencies • Rand McNally provides guides that can be downloaded to cell phones or laminated city maps covering a specific area that fold and last forever • Montana encourages tourism with destination and map information at http://mt.gov/discover/statemap.asp Montana maps can be displayed or downloaded http://www.nris.state.mt.us/gis/gisdatalib/mtmaps.aspx • Download maps of the United States www.50states.com	T18-101 T18-102
	With the Web, travelers have a large source from which to navigate to another state or to a restaurant or other choice destination • Type into any search engine (such as Windows Explorer) the words "trip planning" to start the process of locating a suitable Web site for your needs www.mapquest.com http://maps.yahoo.com Satellites are now used to provide navigational assistance to anyone with a navigation Global Positioning System (GPS) • There is a GPS for most every budget • Systems can be installed directly by some automobile factories when purchasing a new vehicle or added after purchase • Operators of truck fleets and transit operators already use Automatic Vehicle Location (AVL) technology that employs Global Positioning Satellite Systems (GPSS) to keep track of the location of their vehicles on city streets • Satellite radios with streaming real-time features can update the navigation screen in some major cities	T18-103
◆ **Alternative Route Choice**	In cities large and small, from the east coast to the west coast, traffic congestion is steadily getting worse each year in America • A large percentage of the nation's roadway network is congested, more severely and for longer portions of each day, than ever before • The impacts of traffic congestion are far-reaching – impacting individuals, families, businesses and communities • The country's "congestion invoice" amounted to nearly $70 billion in 2001 – the byproduct of 3.5 billion hours of delay and 5.7 billion gallons of excess fuel consumed in congestion-related delays ... A study completed in 2000 shows households earning between $12,000 and $23,000 per year, transportation expenses consume one in every four dollars spent	T18-104 T18-105

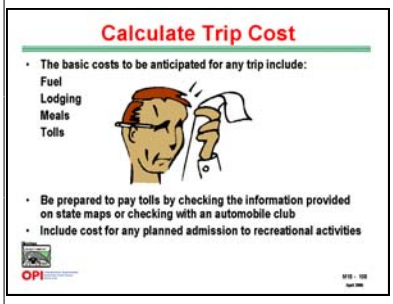
Student Learning Activities	Resources





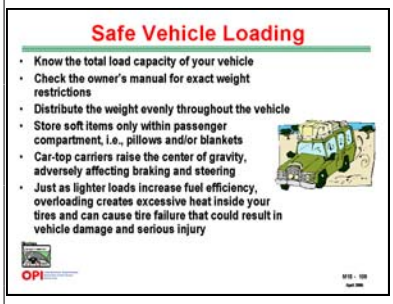
Instructional Topic	Content	Slide
◆ **Alternative Route Choice (Cont.)**	• Travelers are seeking alternatives to traditional transportation modes • Rideshare buses pick up passengers and drop them off for a fee • Bicycling is a popular way to commute • Carpooling is promoted by state and federal organizations for employees within the organization; often with a desirable reward such as tickets to sporting activities • Selecting less congested routes that may be longer in distance but shorter in duration	
◆ **Personal Preparation**	Personal preparation will contribute to enjoyment of the trip • Let a family member or trusted friend know how to reach you in an emergency • Be sure someone knows the departure time, destination, and expected return time • Be prepared to pay any large repair bill in the event of a vehicle breakdown • Determine approximate cost of fuel, meals, lodging, and entertainment • Get a good night's sleep the night before starting the trip • Know the route, check for construction locations • Avoid traveling through congested areas during "rush hour" • Determine the number of hours per day to travel • Make overnight reservations in advance	T18-106
◆ **Vehicle Preparation**	Place items in your vehicle • An extra set of keys in a pocket or with a passenger • Insurance information • Money for expected and unexpected travel expenses • Vehicle owner's manual • Maps of local areas you plan to visit • Water, snacks Have the vehicle serviced before leaving on an extended trip • Start out with a full tank of gas • Check the spare tire	T18-107
◆ **Calculate Trip Cost**	The basic costs to be anticipated for any trip include fuel, lodging, meals, and in some cases tolls • Fuel costs can be estimated by determining as closely as possible the number of miles that you will be driving to and from your destination; add 50 to 100 miles to cover local travel and side trips • The miles to and from your destination can be determined by checking the map's mileage chart or, if that is not provided, adding up the mileage indicated by the miles between points indicated in red and/or black on the map	T18-108

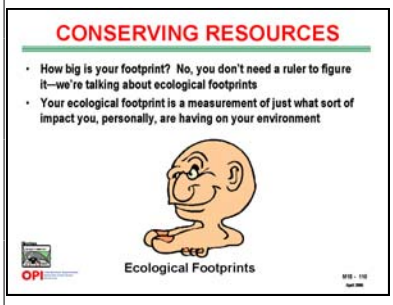
Student Learning Activities	Resources



Instructional Topic	Content	Slide
◆ **Calculate Trip Cost (Cont.)**	• Having calculated the number of miles to be traveled, divide that number by the average miles per gallon (MPG) that you get with the vehicle you will be driving • Estimate the number of miles and calculate how many gallons of gas will be needed based upon the vehicle's fuel economy and the cost of current gas prices • Prices for lodging typically run higher during the peak vacation periods, but at family oriented chains, rooms for one night for two persons are frequently available for about $60 per night • Camping can be a less expensive option • Estimate food consumption and decide the type of restaurant; cost can be up to $25 to $40 per day, per person ... Pack a cooler with sandwiches and sodas and have a picnic • By making motel/hotel reservations in advance, those expenses can be predetermined • Be prepared to pay tolls by checking the information provided on state maps or checking with an automobile club • Include cost for any planned admission to recreational activities	T18-109
◆ **Safe Vehicle Loading**	Know the total load capacity of your vehicle • Check the owners manual for exact weight restrictions • Distribute the weight evenly throughout the vehicle • Store soft items only within passenger compartment, i.e., pillows and/or blankets • Car-top carriers raises the center of gravity, adversely affecting braking and steering • Do not overload your vehicle ... Just as lighter loads increase fuel efficiency, overloading creates excessive heat inside your tires and can cause tire failure that could result in vehicle damage and serious injury ... Overloading a vehicle will increase fuel consumption	T18-110
CONSERVING RESOURCES	Source: http://www.warm2kids.com/guest/teen/26/97/631/index.htm • How big is your footprint? No, you don't need a ruler to figure it — we're talking about ecological footprints • Your ecological footprint is a measurement of just what sort of impact you, personally, are having on your environment. • There isn't any way to go through life without having some impact on the Earth ... Humans need to use the earth's resources for even the most basic lifestyle ... We need certain things like water and plants to stay alive ... We use some substances like iron or wood for shelter, tools, and a variety of other necessities • Americans are known around the world for living big- big cars, big meals, and big buildings	T18-111

Student Learning Activities	Resources





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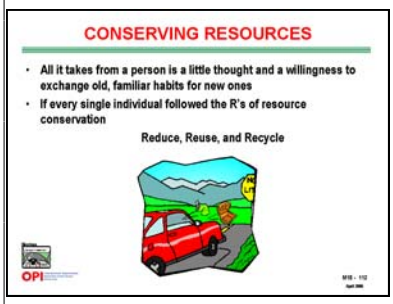
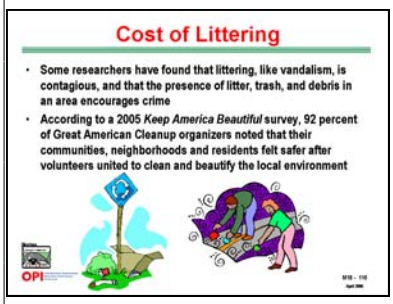
Instructional Topic	Content	Slide
CONSERVING RESOURCES (Cont.)	• But all those big items need a lot of upkeep- bigger cars use more gas; bigger meals often end in more waste and trash; and bigger buildings mean more raw materials to build them and using more gas or oil to heat them • Using the Earth's resources is not a bad thing, but wasting them is • It's important to be conscious of the ways you, personally, are having an impact • There are so many things we do every day out of habit or because it saves three seconds of time that have a big impact on our environment • Many people think that there's not really anything that they can do to help • conservation efforts • Maybe you're thinking "I can't stop the loggers from cutting down trees," or "I can't help it if my parents don't buy a hybrid car" • Just because those are the high profile environmentalist issues that you are hearing about on the news, doesn't mean they are the only issues out there • All it takes from a person is a little thought and a willingness to exchange old, familiar habits for new ones • If every single individual followed the R's of resource conservation — Reduce, Reuse, and Recycle - we'd be spending less and living in a more beautiful world	T18-112
◆ **Montana Litter and Recycling Laws**	**7-5-2109. County control of litter.** (1) (a) Except as provided in 7-5-2112, a governing body of a county may regulate, control, and prohibit littering on any county road and on land within the county by the adoption of an ordinance that substantially complies with the provisions of 7-5-103 through 7-5-107. The ordinance may apply to portions of the county and may apply to persons other than the owners of the property on which littering occurs. (b) The ordinance does not apply to lead, copper, or brass deposits directly resulting from shooting activities at a shooting range. (c) The ordinance does not apply to a "notice of violation" card placed on a motor vehicle illegally parked in a disability parking space. (2) Except as provided in 7-5-2112, the governing body of a county may establish a fine not to exceed $200 as a penalty for violation of the ordinance referred to in subsection (1). A violation of the ordinance may not be punishable by imprisonment. **75-10-1101. Waste oil notice.** (1) Each retailer and wholesaler offering motor oil for sale shall visibly display at an appropriate location within the retail store or wholesale outlet a sign indicating the location of the nearest waste oil recycling collection center if the center is within 25 miles of the retailer or wholesaler. (2) The department of environmental quality shall design an oil recycling sign to be used by retailers and wholesalers. The department may establish the specifications for the sign by rule. **61-3-336. Recycling license plates.** The department is authorized to promote the recycling of used or outdated license plates for the metal content and may enter into contractual agreements with nonprofit organizations for the collection of used or outdated license plates and for their transportation to a central recycling point.	T18-113

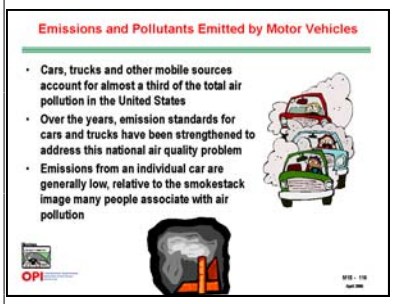
Student Learning Activities	Resources

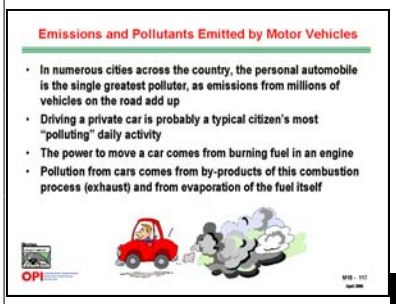


Instructional Topic	Content	Slide
◆ **Cost of Littering**	In Louisiana, state and local governments spent an estimated $15 million a year to clean up beer cans, cigarette butts and other litter • In 2001, Illinois spent more than $12 million picking up litter • Litter is especially undesirable in a state whose economy is heavily dependent upon tourism	T18-114
	Packaging and container waste studies show litter is: • 30 percent of our discards • 25 percent non-durables such as newspapers and old clothing • 20 percent yard waste • 14 percent durable goods such as appliances and tires • 9 percent food waste • 2 percent miscellaneous inorganic wastes	
	Some researchers have found that littering, like vandalism, is contagious, and that the presence of litter, trash, and debris in an area encourages crime • In 2006, the Great American Cleanup is expected to involve close to an estimated 2.5 million people volunteering more than 8 million hours to clean, beautify and improve 16,000 communities during 30,000 events from coast to coast in all 50 states ... Activities will include beautifying parks and recreation areas, cleaning seashores and waterways, handling recycling collections, picking up litter, planting trees and flowers, and conducting educational programs and litter-free events • According to a 2005 *Keep America Beautiful* survey, 92 percent of Great American Cleanup organizers noted that their communities, neighborhoods and residents felt safer after volunteers united to clean and beautify the local environment	T18-115
◆ **Emissions and Pollutants Emitted by Motor Vehicles**	The Federal Environmental Protection Agency (EPA) has a number of programs underway to ensure that vehicles operate cleanly from the time they are produced to the time they hit the junkyard • Information about these and many other programs can be found in the Office of Transportation and Air Quality Web site at www.epa.gov/otaq	
	Cars, trucks and other mobile sources account for almost a third of the total air pollution in the United States • Over the years, emission standards for cars and trucks have been strengthened to address this national air quality problem • Emissions from an individual car are generally low, relative to the smokestack image many people associate with air pollution	T18-116
	• But in numerous cities across the country, the personal automobile is the single greatest polluter, as emissions from millions of vehicles on the road add up ... Driving a private car is probably a typical citizen's most "polluting" daily activity	T18-117

Student Learning Activities	Resources

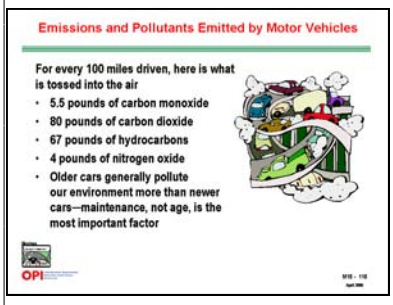


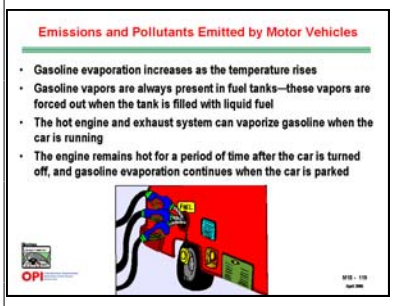




Instructional Topic	Content	Slide
◆ **Emissions and Pollutants Emitted by Motor Vehicles (Cont.)**	• The power to move a car comes from burning fuel in an engine ... Pollution from cars comes from by-products of this combustion process (exhaust) and from evaporation of the fuel itself For every 100 miles driven, here is what is tossed into the air • 5.5 pounds of carbon monoxide • 80 pounds of carbon dioxide • 67 pounds of hydrocarbons • 4 pounds of nitrogen oxide	T18-118
	Older cars are generally more unkind to our environment than newer cars — maintenance, not age, is the most important factor **Exhaust emissions** Gasoline evaporation increases as the temperature rises during the day, heating the fuel tank and venting gasoline vapors **Refueling losses** Gasoline vapors are always present in fuel tanks — these vapors are forced out when the tank is filled with liquid fuel *Running losses* The hot engine and exhaust system can vaporize gasoline when the car is running *Hot soak* The engine remains hot for a period of time after the car is turned off, and gasoline evaporation continues when the car is parked	T18-119
◆ **Keep Vehicles from Polluting**	A car's emissions can be reduced and performance can be enhanced if the manufacturer's recommended maintenance guidelines are followed • By taking proper care of a vehicle it will also extend its life, increase its resale value, and optimize its "gas mileage" or fuel economy • Every car has some items that need to be checked on a regular basis and others that need to be replaced periodically ... These include the air filter, vacuum and coolant hoses, oil, oil filter, fluids, belts • It's also important to keep the tires inflated to the recommended pressure for the best possible fuel economy • Today's vehicles are designed with emission controls as integral components of the power train ... Any tampering with this system is illegal and will not only drastically increase emissions but is likely to have a negative effect on vehicle performance and durability • Have the car serviced by a skilled technician who understands modern emission control systems	T18-120

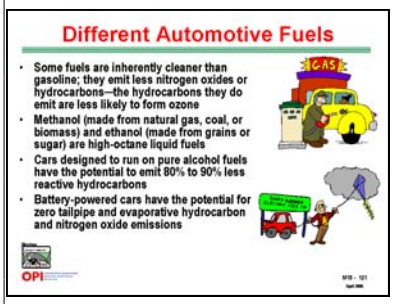
Student Learning Activities	Resources

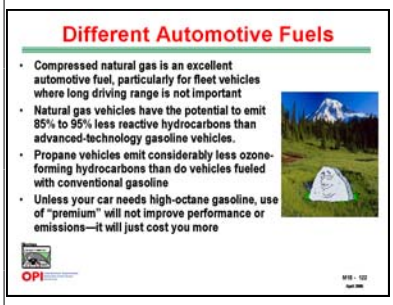




Instructional Topic	Content	Slide
◆ **Different Automotive Fuels**	The only way to ensure healthy air is to markedly reduce our use of cars or to switch to fuels that are inherently cleaner than conventional gasoline **Possible clean fuels** Some fuels are inherently cleaner than gasoline because they emit less nitrogen oxides or hydrocarbons, and because the hydrocarbons they do emit are less likely to react in the atmosphere to form ozone **Alcohols** Methanol (made from natural gas, coal, or biomass) and ethanol (made from grains or sugar) are high-octane liquid fuels • Cars designed to run on pure alcohol fuels have the potential to emit 80 percent to 90 percent less reactive hydrocarbons than advanced-technology gasoline cars **Electricity** Battery-powered cars have the potential for zero tailpipe and evaporative hydrocarbon and nitrogen oxide emissions, though power plant emissions must be accounted for • Today's electric vehicle technology is limited, but promising recent developments may lead to more widespread use in the future • Use of electricity would result in somewhat greater reductions in ozone-forming hydrocarbons **Natural Gas** Compressed natural gas is also an excellent automotive fuel, particularly for fleet vehicles where long driving range is not important • Natural gas vehicles have the potential to emit 85 percent to 95 percent less reactive hydrocarbons than advanced-technology gasoline vehicles **Liquid Petroleum Gas (Propane)** Propane is a byproduct of petroleum refining and natural gas production • Propane vehicles emit considerably less ozone-forming hydrocarbons than do vehicles fueled with conventional gasoline **Reformulated Gasoline** The petroleum industry is studying ways to change refinery procedures to make a cleaner-burning gasoline • A number of "clean" gasolines have recently been introduced into the market-place, and research is continuing to develop even cleaner fuels • Reformulated gasoline, capable of reducing hydrocarbon emissions by at least 15 percent, has been required in some high ozone areas beginning in 1995 • Check your owner's manual to see what type of fuel is recommended for your car ... Unless your car needs high-octane gasoline, use of "premium" will not improve performance or emissions — it will just cost you more	T18-121 T12-122

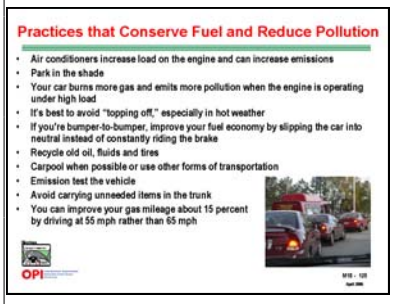
Student Learning Activities	Resources





Instructional Topic	Content	Slide
◆ **Fluids and Parts for Recycling**	Recycling saves resources and reduces pollution—many states require certain vehicle fluids and parts to be recycled Hazardous substances are contained in batteries, oil, gasoline, oil filters, brake fluid, antifreeze and transmission fluids and must be disposed of safely • Hazardous waste must be disposed of safely; many communities have collection centers • Many vehicle parts made of steel, aluminum, engines, car seats, tires, and plastics can be recycled; many can be reconditioned	T18-123
◆ **Practices That Conserve Fuel and Reduce Pollution**	Three easy things you can do to help keep emissions as low as possible • Avoid unnecessary driving • Maintain your car properly • Drive your car wisely Even a perfectly maintained car will pollute more than necessary if it is driven carelessly • Your car's emissions will be lower if you apply common sense to your driving and follow basic rules of the road Driving situations likely to increase pollution include the following **Idling** You will save gas by turning the engine off and restarting it again if you expect to idle for more than 30 seconds • You will also prevent pollution by avoiding long idles • Try parking your car and walking to restaurants, banks, and the like instead of idling in drive-up lanes **Stop-and-go driving** Driving in traffic is not always avoidable, but whenever possible, plan trips outside rush hour and peak traffic periods • Try to "smooth" your driving by accelerating and decelerating gradually, anticipating stops and starts for traffic lights, changing traffic speeds, etc. **Air conditioning** Use of a vehicle air conditioner increases load on the engine and can increase emissions and decrease fuel economy • Try opening the window or the fresh air vent to cool the inside of your vehicle • Park in the shade if you can to prevent the car from heating up in the sun ... Besides keeping the interior temperature of your car more comfortable, you will lessen the pollution and waste that occurs when gasoline evaporates from the engine and gas tank	T18-124 T19-125

Student Learning Activities	Resources



Instructional Topic	Content	Slide
◆ **Practices That Conserve Fuel and Reduce Pollution (Cont.)**	**High engine loads** Your car burns more gas and emits more pollution when the engine is operating under high load; that is, when it is working especially hard • Extra load is created by running the air conditioner, quick accelerations, high-speed driving, climbing grades, revving the engine, and carrying extra weight **Cold temperatures** Emission control systems take longer to warm up and become fully operational in cold weather — idling will not help • Modern vehicles need little warm-up; they're most efficient when being driven Idling for long periods in cold weather can actually cause excessive engine wear **Refueling** Spilled gasoline pollutes the air when it evaporates • Watch what you do at the gas station to prevent spills and overfills • It's best to avoid "topping off," especially in hot weather • Apply the same precautions against sloppy handling when refueling outdoor power equipment such as lawnmowers and outboard motors **Drive with mileage in mind** Don't speed up just to slow down • Avoid "jackrabbit" starts by accelerating gradually whenever possible • Anticipate stops to avoid sudden braking • If you're bumper-to-bumper, improve your fuel economy by slipping the car into neutral instead of constantly riding the brake ... This doesn't apply to hybrids which typically shut off the gas engine when stopped in traffic • And don't try to get around the city on less than a quarter tank of gas ... Not only are city gas stations expensive, they can be hard to locate • Recycle old oil, fluids and tires • Carpool when possible or use a bicycle, bus or other forms of transportation • Emission test the vehicle • Avoid carrying unneeded items in the trunk Extra weight decreases gas mileage • Avoid high speeds ... You can improve your gas mileage about 15 percent by driving at 55 mph rather than 65 mph	

Student Learning Activities	Resources

Instructional Topic	Content	Slide
◆ **Personal Strategies to Reduce Litter in Montana**	**Common Violations** • Throwing litter out of a car or boat • Rolling junked cars into a river or gully • Hauling trash for profit and dumping it in any place that is not a legal landfill • Letting someone else dump tires or any waste on your property, regardless of whether you gain financially from the activity • Pouring used motor oil or restaurant grease into storm drains or down manhole covers • Pouring motor oil on the ground	T18-126
◆ **Global Benefits of Conserving Energy, Reducing Pollution, and Recycling**	To help protect the earth from the sun's powerful ultraviolet radiation, a layer of gas exists about 30 miles above the earth • This gas is known as the stratospheric ozone layer • When certain gases and chemicals escape into the ozone layer, it starts a process that causes the ozone layer to break apart ... Without the protection from the ozone layer, radiation can cause harm to humans, animals, and plant life in many different ways • Ozone at ground level is a noxious pollutant ... It is the major component of smog and presents this country's most urban air quality problem • Ozone is a severe irritant to lungs, skin and is responsible for the choking, coughing, and stinging eyes associated with smog • Ozone damages lung tissue, aggravates respiratory disease, and makes people more susceptible to respiratory infections • Children are especially vulnerable to ozone's harmful effects, as are adults with existing respiratory disease • Even otherwise healthy individuals may experience impaired health from breathing ozone-polluted air • Elevated ozone levels also inhibit plant growth and can cause widespread damage to crops and forests	T18-127
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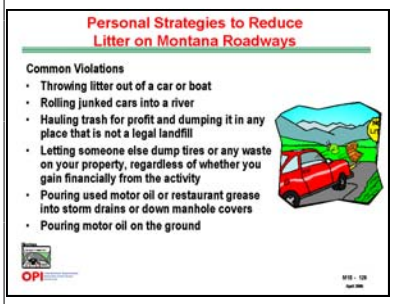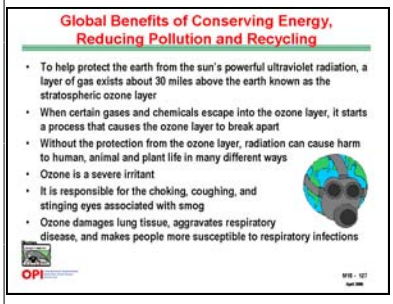
Student Learning Activities	Resources