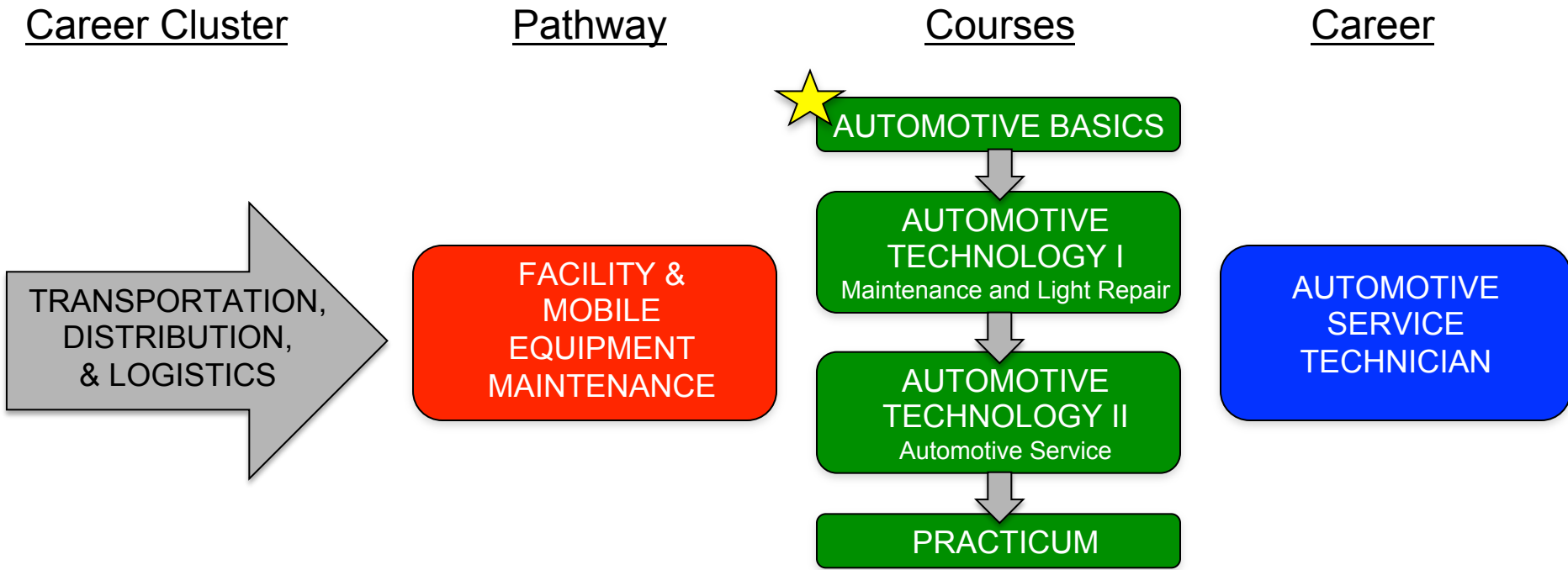


# Automotive Basics



Presenter:

Michael Gray, Co-Author of Auto Upkeep

This presentation is available at [www.AutoUpkeep.com/presentations](http://www.AutoUpkeep.com/presentations).



# Download this Presentation



# Essential Questions

- What are the requirements for Automotive Basics (Texas §130.447).
- What curricular materials are available?
- How does Automotive Basics fit within a complete Automotive Service Technology training program?
- What are the essential units in Automotive Basics?
- What will each student know and be able to do at the completion of Automotive Basics (Texas Essential Knowledge and Skills - TEKS)?
- How does Automotive Basics fit within the ASE Education Foundation (formerly NATEF) Model?



# A Few Questions to Think About...



1. What do your beginning students know when they first enter your program?
2. How do you teach this new generation of students the fundamentals of Automotive Technology?



# What does your first course look like now?

- Discussion...



# Automotive Basics – Course Description

“Automotive Basics includes knowledge of the basic automotive systems and the theory and principles of the components that make up each system and how to service these systems.

Automotive Basics includes applicable safety and environmental rules and regulations. In Automotive Basics, students will gain knowledge and skills in the repair, maintenance, and servicing of vehicle systems. This study allows students to reinforce, apply, and transfer academic knowledge and skills to a variety of interesting and relevant activities, problems, and settings. The focus of this course is to teach safety, tool identification, proper tool use, and employability.”

Source: <http://ritter.tea.state.tx.us/rules/tac/chapter130/ch130p.html>



# Resources for Automotive Basics



[Home](#) > [Laws and Rules](#) > 19 TAC Chapter 130

## 19 TAC Chapter 130. Texas Essential Knowledge and Skills for Career and Technical Education

Texas Education Agency – TEKS §130.447. Automotive Basics can be viewed at:

<http://ritter.tea.state.tx.us/rules/tac/chapter130/ch130p.html>



SEARCH TEACHERS ADMINISTRATORS COUNSELORS MORE LOG IN SIGN UP



14

### Automotive Basics

start

Clusters: **Transportation, Distribution & Logistics**  
Pathways: **Facility & Mobile Equipment Maintenance**  
Courses: **Automotive Basics**  
Grade range: **9, 10, 11, 12, Postsecondary**  
Release date: **12-13-2017**

Tags: **Transportation Industries, Technology, Repair, Service, Maintenance, Equipment, Mechanical, Engine, Engines, Automotive, Braking Systems, Automotive Technology**

Texas CTE Resource Center including Scope and Sequence and Lesson Plans:

<https://txcte.org/course-binder/automotive-basics>

## Auto Upkeep

Maintenance, Light Repair, Auto Ownership, and How Cars Work

[Home](#) [Books](#) [Schools](#) [Homeschools](#) [Chapter Resources](#) [Look Inside](#) [Reviews](#)

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TEKS – Auto Upkeep Correlation Matrix:

<http://www.autoupkeep.com/standards>

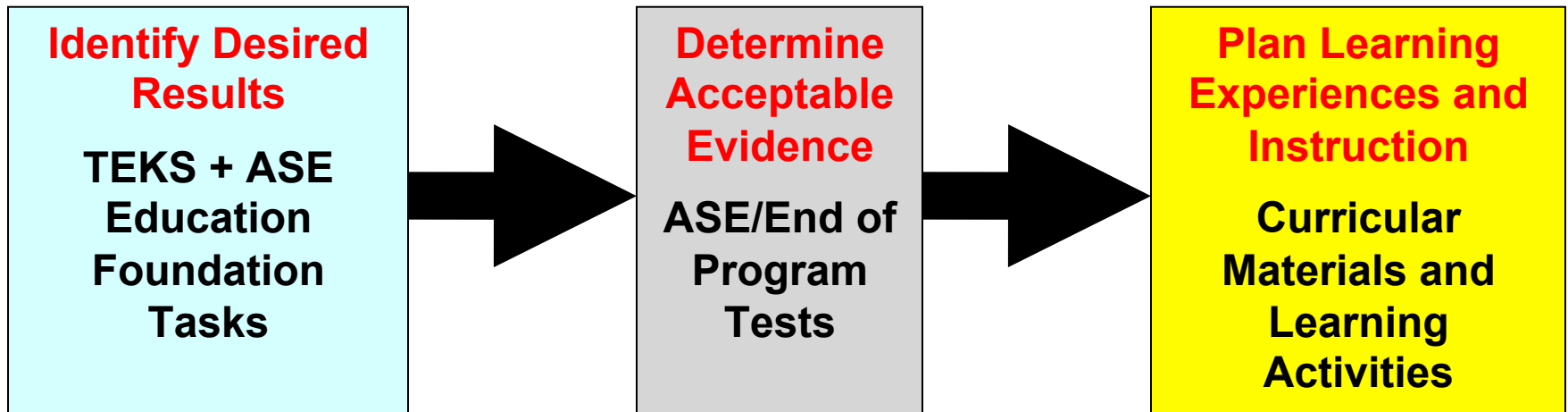


# Curriculum Design

Step 1

Step 2

Step 3



Adapted from Wiggins and McTighe - *Understanding by Design* framework.





# Enduring Understandings



**Priority 3**

Worth Being Familiar With

**Priority 2**

Important to Know and Do

**Priority 1**

Enduring Understanding

**ASE Education Foundation Requirements**

P-3 Tasks 50%

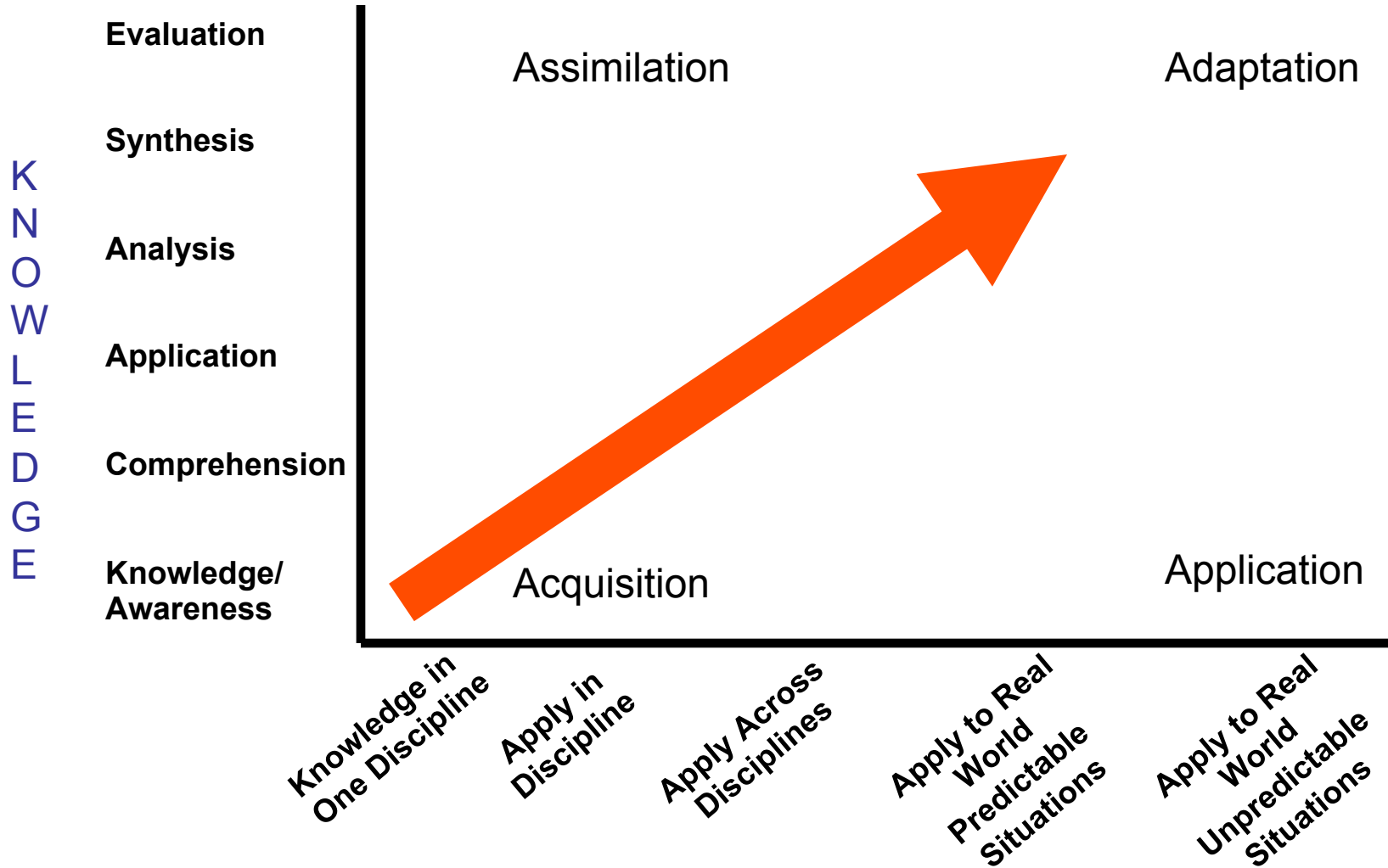
P-2 Tasks 80%

P-1 Tasks 95%

**Central to discipline.  
Has long lasting value beyond the classroom.  
Students revisit these during their lifetime.**



# Rigor/Relevance Framework



# How is Automotive Basics rigorous?

- Automotive Basics is Rigorous –
  - Students:
    - Learn in the **Cognitive** (knowledge), **Affective** (attitudes), and **Psychomotor** (skills) domains.
    - **Think and work.**
    - Apply knowledge **across disciplines.**
    - Apply knowledge to **real-world predictable situations** (e.g., change oil, rotate tires, check tire pressure, periodic inspections, check fluid levels).
    - Apply knowledge they learned to **real-world unpredictable situations** (e.g., burned out headlight, dead battery, flat tire, burst radiator hose, car stuck).



# The Future is Bright for Automotive Basics

- Did you know...
  - 80% of vehicles need service, fluids, or replacement parts  
(Car Care Council, 2017)
  - 11.6 years old is the average age of cars and trucks in the USA  
(IHS Markit, 2016)

Common Vehicle on the Road Today  
Is Over 11 Years Old  
Has 139,000+ Miles  
Needs Service

#### References:

IHS Markit. (2016). Vehicles Getting Older: Average Age of Light Cars and Trucks in U.S. Rises Again in 2016 to 11.6 Years, IHS Markit Says. [Press Release]. Retrieved from <http://news.ihsmarket.com/press-release/automotive/vehicles-getting-older-average-age-light-cars-and-trucks-us-rises-again-2016>  
Car Care Council. (2017). Community Car Care Events Show Most Vehicles Need Service. [Press release]. Retrieved from <http://media.carcare.org/2017-07-11-Community-Car-Care-Events-Show-Most-Vehicles-Need-Service>



# Uninformed Consumers



<https://www.youtube.com/watch?v=MWdmD1jF8aw>



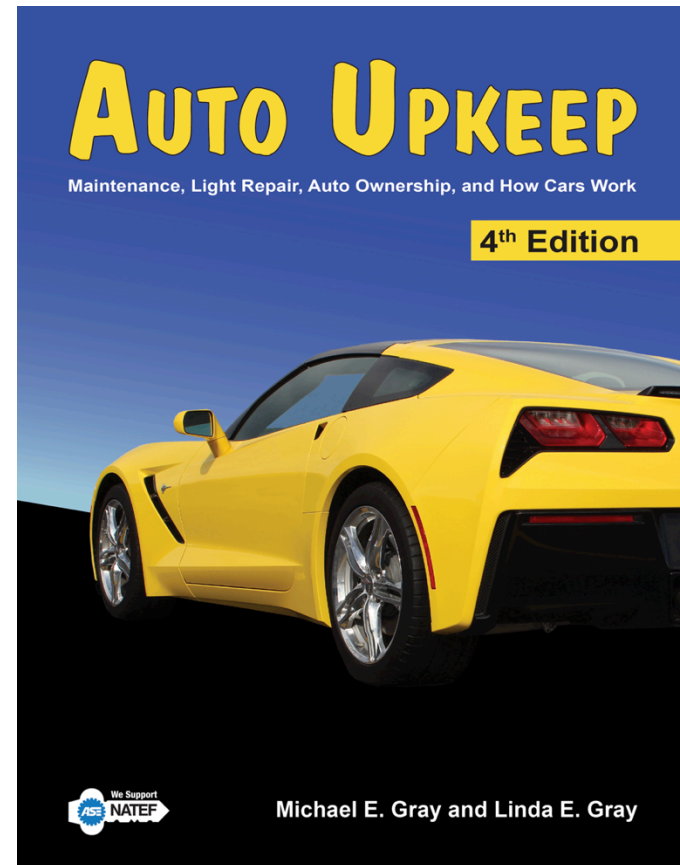
<https://www.youtube.com/watch?v=IOooYBJWBa4>

What happens when you don't change the oil as required?



# What is Auto Upkeep?

- Was developed because most texts are either too complex or too simple to teach an Automotive Basics course.



# Think of it this way...

**1500+ Pages = Comprehensive Automotive Technology Textbook Includes  
a lot of “Worth Being Familiar With” Information**

**Best Suited for MAST Programs**

**Auto Upkeep = 288 Pages = Best Suited for Automotive Basics/MLR Programs  
Information Central to Discipline, Long Lasting Value Beyond the Classroom**



# What's special about Auto Upkeep?

- Short, concise chapters
- 12 point font – Easy-to-Read
- 3 Levels of headings when necessary
- A figure, picture, or graph accompanies almost every block of text
- Helpful emphasis blocks – Tech Tips, Price Guides, Web Links, Servicing, Trouble Guides, Activities, Q & A's, Career Paths, Calculations
- Videos, Apps, and QR Codes to extend learning online
- Reviewed by young adults and technical reviewers
- Extensive effort was put on book layout
- Hands-on and Internet-based activities (40 activities in all)





# What are the Auto Upkeep units?

1. Introduction and How Cars Work
2. Buying an Automobile
3. Automotive Expenses
4. Repair Facilities
5. Safety Around the Automobile
6. Tools and Equipment
7. Auto Care and Cleaning
8. Fluid Level Check
9. Electrical System
10. Lubrication System
11. Fuel System
12. Cooling System and Climate Control
13. Ignition System
14. Suspension, Steering, and Tires
15. Braking System
16. Drivetrain
17. Exhaust and Emission System
18. Alternative Fuels and Designs
19. Automotive Accessories
20. Common Problems and Roadside Emergencies

\* 40 hands-on and internet-based activities engage the students



# How is Auto Upkeep commonly delivered?

- Auto Upkeep was designed to have a balance between in-class and hands-on instruction.
  - Commonly two days a week are in-class and three days a week are in the automotive lab.
  - Curriculum is flexible for you to adjust it to fit your specific situation.



# What will each student know and be able to do at the completion of Auto Upkeep?

- Automotive Basics TEKS – 100%
- Competencies – Over 200
- Over 60% of ASE Education Foundation Maintenance and Light Repair (MLR) Tasks – making it an ideal first course.

» [www.AutoUpkeep.com/standards/](http://www.AutoUpkeep.com/standards/)



# Instructor USB – Turn Key Curriculum or Modify it as YOU Want

- Sample Course Syllabus Outline
- PowerPoints
- Competency Profile
- MLR Correlation Matrix
- TEKS Correlation Matrix
- Tests and Exams
  - Available as PDFs, MS Word Docs, and as a Common Cartridge File for your Learning Management System (Canvas, Blackboard, etc.)
- Lab Activities
- Study Questions
- Answer Keys



# QR Codes for Each Chapter



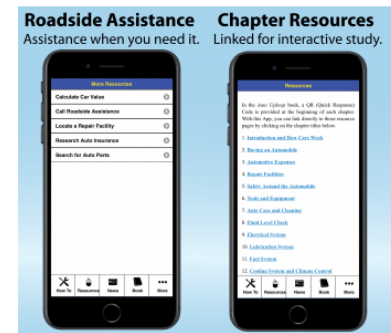
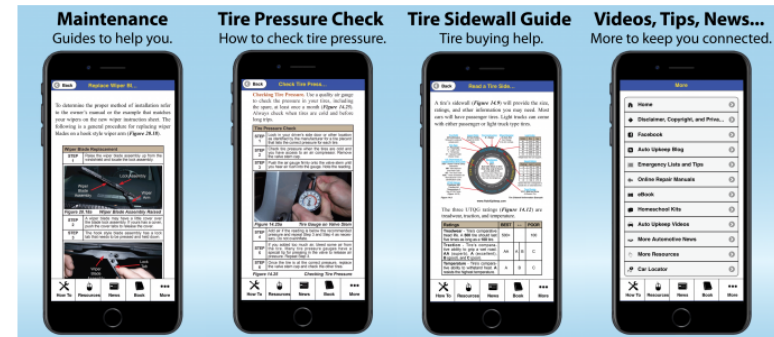
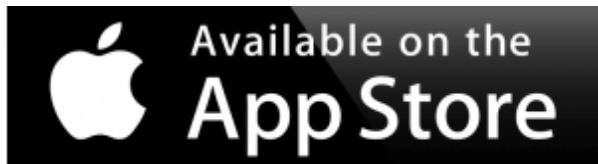
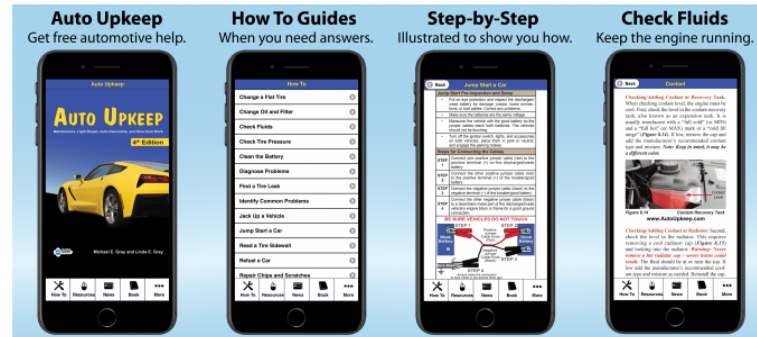
## BRAKING SYSTEM

CHAPTER

15



# App to Extend Learning

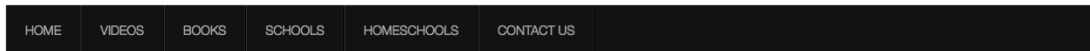


[www.AutoUpkeep.com/app/](http://www.AutoUpkeep.com/app/)



# Video Site with Over 100 Videos

## Auto Upkeep Videos



### Chapter 18 – Alternative Fuels and Designs



Energy is used to propel vehicles. Energy cannot be created or destroyed, but it can be converted from one form to another. In a traditional internal combustion vehicle, gasoline or diesel is used as chemical energy in the combustion process. Some alternative fuels are derived from petroleum (e.g., propane and natural gas), others are non-petroleum based using renewable energy. The most popular alternative designs and fuels are hybrid, electric, plug-in hybrid, and flex-fuel vehicles. The fundamentals of achieving high efficiency in all vehicles include start-stop technology, low-rolling-resistance tires, underbody aerodynamics, and automated grill shutters. Hybrid and electric vehicles may also use regenerative braking, high capacity/low weight batteries, electric-only drive, and plug-in capability. The technological considerations of ideal alternative propulsion systems are whether they are environmentally safe, sustainable, practical, renewable, and affordable.

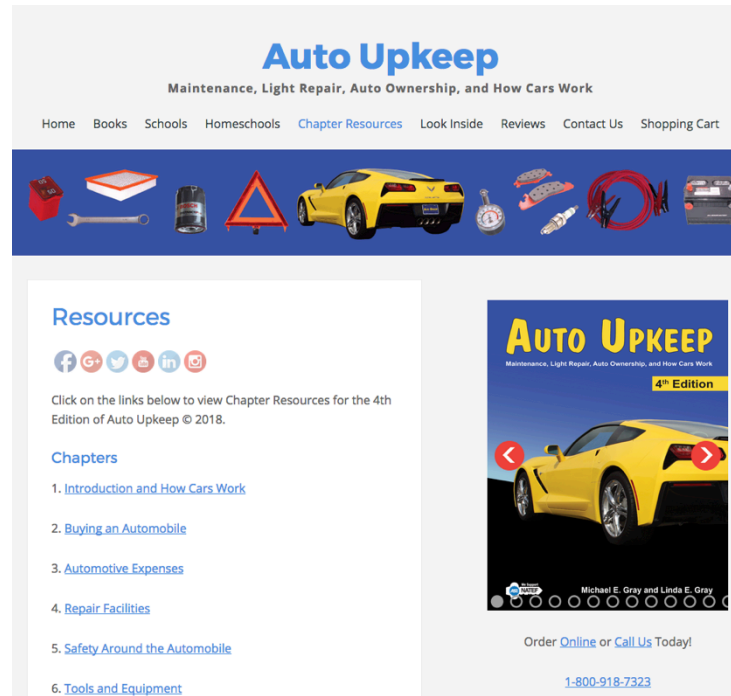


[www.Video.AutoUpkeep.com](http://www.Video.AutoUpkeep.com)

[www.AutoUpkeep.com](http://www.AutoUpkeep.com)



# Online Chapter Resources



The screenshot shows the website for 'Auto Upkeep'. At the top, the title 'Auto Upkeep' is in blue, with the subtitle 'Maintenance, Light Repair, Auto Ownership, and How Cars Work' below it. A navigation menu includes 'Home', 'Books', 'Schools', 'Homeschools', 'Chapter Resources', 'Look Inside', 'Reviews', 'Contact Us', and 'Shopping Cart'. Below the menu is a blue banner with various automotive icons: a red battery, a white box, a black can, a red triangle, a yellow car, a spark plug, a red cable, and a black battery. The main content area is divided into two columns. The left column is titled 'Resources' and features social media icons for Facebook, Google+, Twitter, LinkedIn, and YouTube. Below these icons, it says 'Click on the links below to view Chapter Resources for the 4th Edition of Auto Upkeep © 2018.' Under the heading 'Chapters', there is a list of six links: '1. Introduction and How Cars Work', '2. Buying an Automobile', '3. Automotive Expenses', '4. Repair Facilities', '5. Safety Around the Automobile', and '6. Tools and Equipment'. The right column features a book cover for 'Auto Upkeep 4th Edition' by Michael E. Gray and Linda E. Gray. The cover shows a yellow sports car. Below the cover, it says 'Order Online or Call Us Today!' and provides the phone number '1-800-918-7323'.

**Auto Upkeep**  
Maintenance, Light Repair, Auto Ownership, and How Cars Work

Home Books Schools Homeschools **Chapter Resources** Look Inside Reviews Contact Us Shopping Cart

**Resources**

Click on the links below to view Chapter Resources for the 4th Edition of Auto Upkeep © 2018.

**Chapters**

- [1. Introduction and How Cars Work](#)
- [2. Buying an Automobile](#)
- [3. Automotive Expenses](#)
- [4. Repair Facilities](#)
- [5. Safety Around the Automobile](#)
- [6. Tools and Equipment](#)

**AUTO UPKEEP**  
Maintenance, Light Repair, Auto Ownership, and How Cars Work  
4th Edition  
Michael E. Gray and Linda E. Gray

Order [Online](#) or [Call Us Today!](#)  
1-800-918-7323

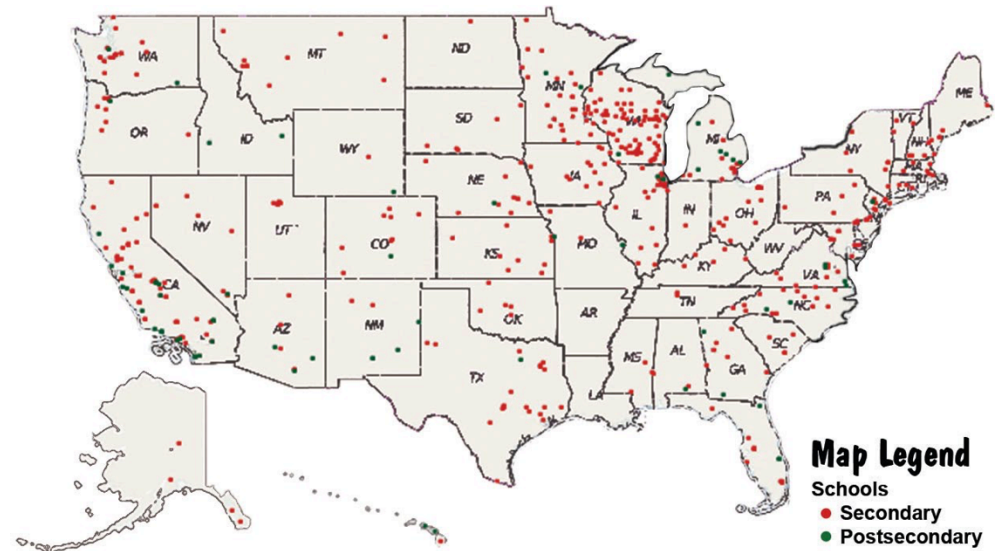
[www.AutoUpkeep.com](http://www.AutoUpkeep.com)





# Who's using Auto Upkeep?

- Over 500 secondary and post-secondary schools throughout the United States and Canada
- Large schools in Texas to small schools in Wisconsin
- Over 100,000 copies sold since inception
- Now in the 4<sup>th</sup> Edition



How does Auto Upkeep, ASE  
Education Foundation's MLR Tasks,  
and Automotive Basics fit together?



# AUTO UPKEEP

Auto Upkeep provides a practical automotive foundation for all students, while also drawing students into advanced automotive technology programs. Visit [www.AutoUpkeep.com](http://www.AutoUpkeep.com) to learn more.

**More Informed Consumer**

No ASE\* Test

## Auto Upkeep Curriculum



Texas Essential Knowledge and Skills (TEKS) for Automotive Basics (100% Correlation to Auto Upkeep)

135 Hours of Instruction

### MLR Program

Maintenance and Light Repair - 218 Tasks (60% Correlation to Auto Upkeep)

540 Hours of Instruction

### AST Program

Automobile Service Technology - 353 Tasks (Includes MLR Tasks)

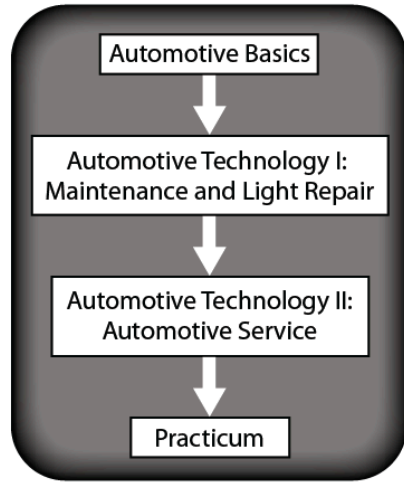
840 Hours of Instruction

### MAST Program

Master Automobile Service Technology - 439 Tasks (Includes MLR and AST Tasks)

1200 Hours of Instruction

## Texas High School Automotive



**Entry Level Technician**

ASE\* G1 Test

**Automotive Technician**

ASE\* A1 - A8 Tests

ASE\* A1 - A8 Tests

\*Automotive Service Excellence (ASE) Certification Tests

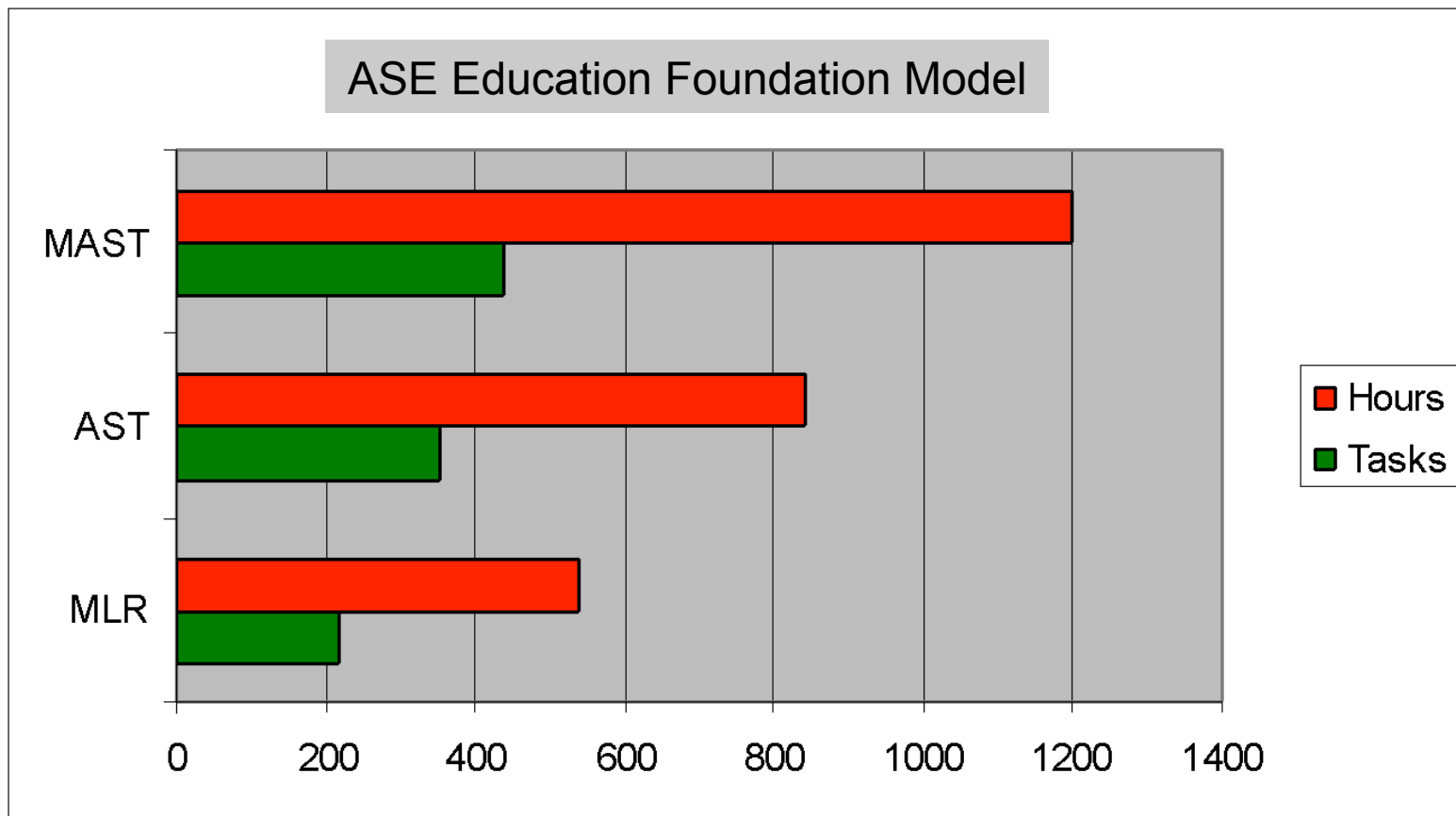
ASE\* Master A1 - A8 Tests All Required

## ASE Certification Test Series

- G1 - Auto Maintenance and Light Repair
- A1 - Engine Repair
- A2 - Automatic Transmission/Transaxle
- A3 - Manual Drive Train and Axles
- A4 - Suspension and Steering
- A5 - Brakes
- A6 - Electrical/Electronic Systems
- A7 - Heating and Air Conditioning
- A8 - Engine Performance
- A9 - Light Vehicle Diesel Engines



# ASE - Tasks/Hours



MAST – 439 tasks at 1200 hours (Includes MLR and AST)

AST – 353 tasks at 840 hours (Includes MLR)

MLR – 218 tasks at 540 hours



# What is a Task?

- “A task is a psychomotor or cognitive entry-level learning activity consisting of one or more measureable steps accomplished through an instructor presentation, demonstration, visualization or a student application.”
  - » Obtained from the ASE Education Foundation - <http://aseeducation.org/resources>
  - It should be noted that each task is not dedicated an hour allotment...some tasks take longer than others.



# ASE Education Foundation Assumptions

- “Individual courses of study will differ across automobile technician training programs”
- “Development of appropriate learning delivery systems and tests which monitor student progress will be the responsibility of the individual training program”

» Obtained from the ASE Education Foundation - <http://aseeducation.org/resources>



# Basically...

- TEKS lists the required knowledge and skills.
- The ASE Education Foundation provides the required tasks and hours.
- YOU provide the program course structure, curriculum, and student materials.



# Questions?





# To Get Free eBook Access

Sign-Up on the Sign-In Sheet and I will email you an eBook access code.



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Twitter – [www.Twitter.com/AutoUpkeep](http://www.Twitter.com/AutoUpkeep)

Videos – [www.Video.AutoUpkeep.com](http://www.Video.AutoUpkeep.com)

YouTube – [www.YouTube.com/AutoUpkeep](http://www.YouTube.com/AutoUpkeep)

Facebook – [www.Facebook.com/AutoUpkeep](http://www.Facebook.com/AutoUpkeep)

