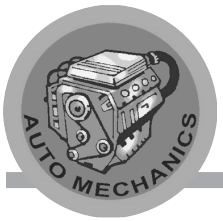

Auto Mechanics Merit

Note: Safety is a must! Working on a vehicle requires the owner's permission. Adult supervision is a requirement for safety's sake. Use safety stands that are the proper ton rating to correctly support a raised vehicle before removing any wheels. Be sure the stands are under the vehicle's frame, not under the "A-frame." The legs of the stands should rest on solid, level ground, not on soft or uneven surfaces that could allow a stand to collapse.

1. Describe the components and functions of the following major systems and structures of a vehicle.
   a. Drive system
   b. Chassis system
   c. Power plant
   d. Control system
   e. Running gear
   f. Electrical system

Leader's Initials ☐
Date_____

2. Draw a diagram explaining the function and operation of a four-cycle, internal combustion engine. Explain the differences between a four-stroke gasoline engine and a four-stroke diesel engine.

Leader's Initials ☐
Date_____

3. Explain the mechanical differences and similarities of three makes of automobiles or trucks. List the vehicle that you would prefer to own and explain why.

Leader's Initials ☐
Date_____

4. Apply for a driver's permit from your state's licensing agency. Demonstrate your ability to drive carefully after receiving your permit. Write a one-page report indicating how you drove carefully. Take care of an auto properly for two months.

Leader's Initials ☐
Date_____

5. Create a table similar to the following to track maintenance on a vehicle under your care.

   Make of Vehicle (Ford, Mazda, etc.) _____
   Year of Vehicle _____
   Model of Vehicle (Sedan, Pickup) _____

Leader's Initials ☐
Date_____

Description of Service or Duty	Service Performed (if any)	Specifications Needed	Date Completed
Inspect the fluid levels of the following: brake fluid, engine oil, coolant, power-steering fluid, windshield washer fluid, transmission fluid, battery fluid (unless "maintenance free").			
Find the location of the fuse boxes and the size of the fuses. Demonstrate how to recognize and to replace burned-out fuses properly.			
Check all lights and warning devices: Headlights, taillights, turn signals, hazard signals, clearance lights, dome light, dash lights, charging system indicator, lubrication system indicator, brake warning light (including ABS [antilock braking system] light).			
Inspect the vehicle exhaust system for leaks or faulty parts.			
Change the motor oil and oil filter. (Be sure you know how much oil to put into a vehicle's crankcase).		Quarts used	
Remove and change the air filter.			
Replace the spark plugs, checking the spark gap of each plug and setting it according to the manufacturer's specifications (sometimes recorded on a decal by the radiator).		Plug gap	
Check the tire air pressure. Change a flat tire.		Tire Pressure	
Inspect the brakes, both disc and drum.			
Demonstrate how to properly and safely connect jumper cables between two vehicles to be able to jump-start a disabled vehicle.			
Wash and wax a vehicle.			

Leader's Initials _____
Date _____

Leader's Initials _____
Date _____

6. Explain what the symbols molded into the tire mean. Explain how to determine if a tire needs to be replaced due to wear.

7. Explain how a computer operates the fuel-injection system in a car. Describe the differences between a carbureted system and a fuel-injection system.

8. Complete the following:
   a. Explain why a vehicle needs a fuel filter and an air filter. Locate these filters on a vehicle and point them out for your commander.
   b. Describe the antilock braking system and its purpose.
   c. Explain the purpose, importance, and limitations of the passive restraint system on a vehicle.

d. Describe the safety items to be checked for good working order when purchasing a used vehicle.

e. Describe the operation of three types of ignition systems: point-type, breakerless type, and distributorless type.

f. Define *viscosity.* Describe the difference in viscosity between 10W/30 and SAE30 weight oils.

Leader's Initials

Date_____

9. Create a chart similar to the one below. Maintain a record of a vehicle's performance over two thousand miles. Include things such as fuel consumption, lubrication, oil consumption, and repairs.

Make of Vehicle (Ford, Mazda, etc.)_____

Year of Vehicle_____

Model of Vehicle (Sedan, Pickup)_____

Indicate mileage of vehicle at the start of this report_____

Leader's Initials

Date_____

Date	Mileage on Odometer	Maintenance or Repair Needed	Cost to Make Repair
		Oil/filter change	$16.00 (approximate)
		Add coolant	$5.00 (approximate)
		Inflate tires	$0

Date	Mileage on Odometer	Amount of Fuel (In gallons)	Total Cost of Fuel