

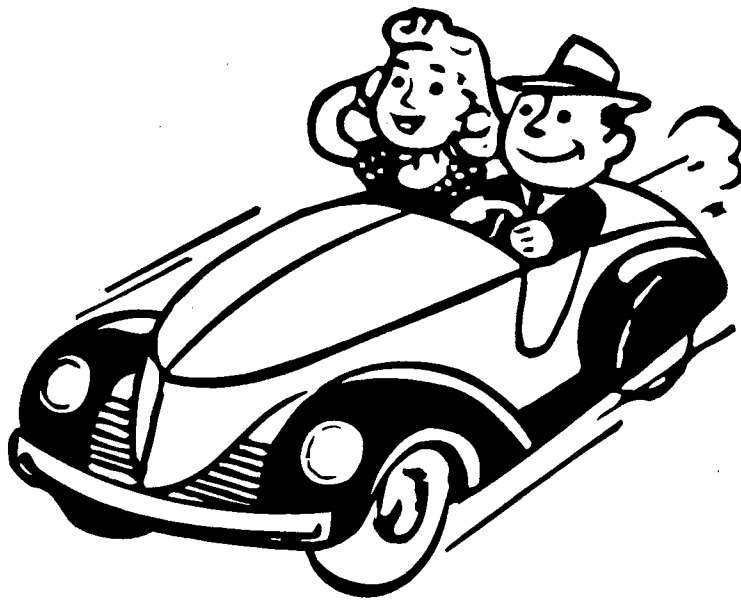
NAME _____

CLUB _____

AGE _____

UNIT 1
THE CAR AND THE HIGHWAY

4-H
AUTOMOTIVE PROJECT IN CARE
AND SAFETY



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4-H
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OUTLINE OF UNITS

The impact motor vehicles — automobiles and trucks — have made on modern living makes it important that each of us have more opportunities to learn about the safe care and operation of automobiles, and for many of us, light trucks.

Here is one of those opportunities, an invitation to participate in the 4-H Automotive Care and Safety Project, developed especially for the maturing club members, 14 years of age and older. Its purpose is to help you achieve and enjoy being a safer and more efficient automobile driver.

Whether or not you have started to drive, the 4-H Automotive Care and Safety Project offers you an opportunity to share with others in your age group, the advantage of learning more about the automobile, how it should be handled on the road, the cost involved in operating it, and how to maintain the car properly. This project is meant to supplement, not replace, any recognized driver training course your school, or community, may sponsor or endorse.

Following is an outline of the contents of the three Units, of which this manual is Unit 1.

UNIT 1: The Car and the Highway

- Section I. You and the Automobile.
- Section II. Highway Safety.
- Section III. Group Activity — Highway Hazard Hunt.
- Section IV. What Makes a Car Go! and Stop!
- Section V. The Engine in General — Simple Principles of Internal Combustion.
- Section VI. Carkeeping.
- Section VII. Car Costs and Record Keeping.
- Section VIII. Traffic Code and Your Future Responsibilities.
- Section IX. Car Inspection — Safety Checking a Car.

UNIT 2: Maintenance and Operation

- Section I. The Engine as a Power Unit.
- Section II. The Engine Needs Clean Air.
- Section III. How The Fuel System Works.
- Section IV. Igniting the Air-Fuel Mixture.
- Section V. Career Opportunities.
- Section VI. Group Activities — Safety Lane and Braking Demonstration.
- Section VII. How Engine Temperature is Controlled.
- Section VIII. General Lubrication.
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- Section I. What Does It Cost to Own and Operate A Car?
- Section II. How Power is Transmitted by the Engine.
- Section III. What Makes for a Smooth, Safe Ride.
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- Section V. The Electrical System.
- Section VI. What to Look For in Buying a Used Car.
- Section VII. Operating Your Car Efficiently.
- Section VIII. How to Make Your Community a Safer Place to Drive
- Section IX. Group Activities — Economy Run and Driving Skill.

UNIT 1, SECTION I



YOU AND THE AUTOMOBILE

You like cars. All teenagers like cars, so much so that they can hardly wait to learn to drive, and then to own a car. You've never known a time when there weren't automobiles and trucks. But young folk in most other countries, like your great-grandparents when your age, probably never rode in automobiles.

Getting a driver's license, proving one's ability to operate a car with reasonable safety, is a common goal of all young people. It's really something to look forward to, isn't it? But to earn that right calls for planning and preparation.

As a pre-driver you have time to learn what it takes to become a good driver, what is required to drive a car safely and more economically. That's the purpose of this Automotive Care and Safety Project. It is designed to help you learn and understand more about the automobile — how the engine works, how each major part of the car operates, and how to keep the car in good condition. Learning to do these things right before you start to drive will help put you a step ahead as a careful operator of a motor vehicle.

Thousands of 4-H'ers have agreed that this is a good idea — and there's fun in it, too.

Why is learning about automobiles important?

For one thing, more than 132 million motor vehicles operate on our streets and highways today. Did you know that 80.5% of all families in the United States own cars?

Another reason is that for most families an automobile represents a large investment of money, both as to initial cost and to upkeep.

But whether a family owns a car or not, and regardless of the cost, motor vehicles are a vital part

of American life. You'd have difficulty naming all the ways they serve you and your family, and it would be just as hard to think what it would be like without these services.

Probably no other invention has had a greater impact on American economy and society. The automobile industry has created millions of jobs, helped raise wages and the standard of living. Cars and trucks play a key role in our modern system of production and distribution of goods and services.

While it is just as far from here to there as it was 50 years ago, motor vehicles have become distance-shorteners and time-savers, as we travel over the greatly improved road and highway systems that have been forced into being.

As a result your school is bigger, better equipped, more centrally located. You can attend educational and sporting events at rival schools because cars and buses provide quick, low-cost transportation. You can take advantage of more vacation and recreational travel because motor vehicles have greatly reduced the time, and in the case of family units, the cost of getting there and back.

The automobile speeds doctors on calls, brings clinics and hospitals within the reach of all. Everyday needs — food, fuel, medicine, mail — reach you faster and at lower cost.

Trucks move the products of farms, canneries and factories quickly to markets and stores. Almost everything you eat, wear, or otherwise use, travels at least part of its way to you over the highway in trucks or cars.

Many businesses, unknown a few decades ago, have been created because of widespread use of motor-vehicles—motels, drive-in theaters, shopping centers, for example. You may think of a dozen others.





Motor vehicles and highway transportation have helped to make America great. Truly we're a nation on wheels and our economy has prospered because of it. Did you know that Americans own almost two-thirds of all the automobiles in the world, while we make up only one-sixteenth of its population? Primitive forms of transportation in many countries act as a giant brake on the whole economy, because the methods of moving people and goods are cumbersome and costly.

So much for the plus side of motor vehicle use, the benefits. What about the minus side? It needs the attention of every driver and pre-driver, because the matter of motor vehicle accidents is a serious one.

Every year thousands of people are killed, and hundreds of thousands are maimed and injured in accidents on our streets, roads and highways. Property damage alone amounts to billions of dollars; no monetary value could ever be placed on the lives lost.

Traffic accidents need not happen, and most could be prevented if each driver, while behind the wheel, remains aware of the power and potentiality of the motor vehicle he is driving and keeps it under constant control.

Your Automotive Care and Safety Project is designed to help you cultivate the proper attitude toward others on the road, and toward the necessary driving skills, in an effort to greatly reduce the number of traffic mishaps. You will learn how a substantial part of the highway toll can be avoided through proper use and care of your automobile.

You will enjoy your progress from one section to another — from one 4-H meeting to another.

- Do you have a better understanding of the importance of the motor vehicle on the American way of life? This is the primary objective of this section.

- What basic elements of highway safety do you need to know? That's coming up when you have a meeting on highway safety and a hazard-hunt activity.

- Do you have a deep appreciation of traffic and other laws related to the operation and ownership of motor vehicles? That's coming up under "Rules for the Road."

- What principle service and maintenance operations should you be able to perform? These include such elementary tasks of car maintenance as cleaning and polishing, care of tires, checking under the hood, etc.

- How many basic parts of a car can you name? You'll discover some of these when you do activities under "What Makes a Car Go! and Stop!"

- Do you know what principles of force and gravity are at play in safe motor vehicle operation? You'll learn more about these later.

- How much does it cost to own and operate an automobile? Wait, you may be surprised.

- Are you interested in career opportunities in the automotive field? You'll get some insights into these.

With this brief background of the significance of the motor vehicle and the objectives of the Automotive Care and Safety Project, we are ready to launch into what could prove to be one of the most interesting experiences you'll have in 4-H.





UNIT 1, SECTION I

YOU AND THE AUTOMOBILE

LET'S DISCUSS

Read through quickly and check whether you agree or disagree. Then discuss the questions together. You might want to try these on your family also.

| | <i>Agree</i> | <i>Disagree</i> |
|-----------------------------------------------------------------------------------------------------|--------------|-----------------|
| 1. My family could get along without an auto..... | _____ | _____ |
| 2. Automobiles are more important to people outside of metropolitan areas, than to city people..... | _____ | _____ |
| 3. Automobiles are too powerful today..... | _____ | _____ |
| 4. For most families the automobile represents a large investment..... | _____ | _____ |
| 5. Motor vehicles have created a need for many businesses unknown a few decades ago..... | _____ | _____ |
| 6. More people are injured or killed in auto accidents than by any other cause..... | _____ | _____ |
| 7. Most automobile accidents could be prevented..... | _____ | _____ |
| 8. Most teen-agers know how to drive properly when they reach legal age..... | _____ | _____ |

LET'S DO

Each member is to do the following:

1. List five main ways the car is used by your family. a. _____
b. _____ c. _____ d. _____ e. _____
2. What changes would have to be made if suddenly there were no automobiles in your community? _____

3. How far do you travel to--the doctor or dentist? _____ miles. Go to church? _____ miles. Go to school? _____ miles. Do the family shopping? _____ miles.
4. What do you do now in the care of your family car? What do you and your family think you could do as a part of this project in caring for the car? _____

5. Find out from your parents what the price range of their car was when new. What year and model is it and how long do they plan to keep it. _____
6. If a person earns \$50 a week, how long would it take at that rate to purchase the average low-priced car, using the entire amount each week? _____
7. Report on the most interesting auto trip that your family has taken in your present automobile. _____

8. Discuss any auto accidents which have occurred in your family during the past year. _____

9. Divide your club into smaller groups and do the following:
 - a. Find out how many cars there are in your county _____
 - b. Talk to an exchange student or a person who has traveled in another country and give information about motor vehicle use in that country. _____
 - c. Talk to three neighbors and find out what concerns each most as a driver in your community. _____



"Traffic accidents don't just happen—they're caused."

No doubt you've heard that slogan a lot of times, but have you ever really thought what it means?

It tells us that accidents are caused, but by whom or what? By carelessness or poor judgment on the part of the driver? By some defect in the car itself? By hazardous road conditions?

Studies show that 17 out of 20, or nearly 85% of the traffic accidents are a result of driving errors; the other 15% are a result of mechanical failure or of road conditions, which may also be somebody's error.

It won't be long now until you will be driving and will be exposed to the possibility of traffic accidents. How you meet the test of everyday driving depends upon; (1) how well you learn to drive before attempting to operate a motor vehicle; (2) how well you know the rules of the road; and (3) how sound an attitude you have towards driving responsibilities.

It is no secret that many adult drivers are "set" in their poor driving habits, because they did not learn to drive the right way. Many of them began to drive with poor attitudes and have not been able to change. Many have already had an accident and probably will have another before their driving career is over.

This is where you can get the jump on them— you have not had time to pick up a lot of bad driving habits. With the proper training and right attitude, you can learn to be a real "pro", to be one of the best drivers on the road. This is why it is important to learn about safe driving BEFORE you start to drive.

Driving is not kid stuff. It requires mature skill and judgment. Unfortunately many young people have not learned that responsibility goes with driving a car.

As a result, they are involved in more than their share of accidents. For example, during a recent year, 10.3% of the licensed drivers were under 20 years old but they were involved in 19.1% of the total motor-vehicle accidents.

Let's take a hard look at the teenage traffic accident situation, and then consider some things we can do to improve it. During a recent 12 month period, teenagers:

Were involved in accidents at the rate of 1 for every 5 licensed drivers.

An average of about 13,300 teenage drivers were involved in accidents per day.

Were responsible for an estimated loss of \$4,300,000,000 in motor vehicle accidents.

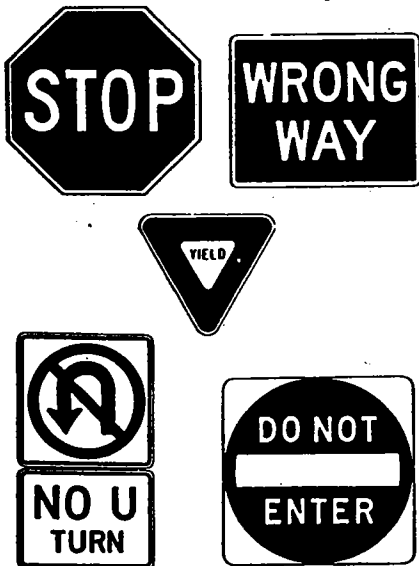
Teenagers have also experienced a large proportion of convictions for traffic offenses when compared with the number of licensed drivers in their age group. For example, in New Jersey, one study showed 14% of the convictions were for teenagers, yet they comprised only 4.4% of the drivers.

Though teenagers have a high accident rate, they are not the only ones that have accidents. In 1975, some 46,000 persons were killed in motor-vehicle accidents and about 1,800,000 suffered disabling injuries. The total estimated cost of these accidents amounted to \$21,200,000,000.

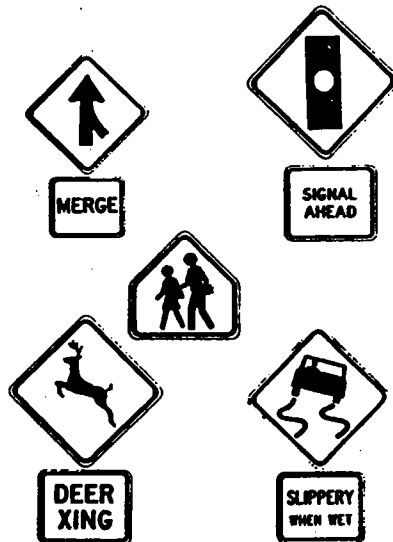
Think of it! During those 12 months, one person was killed on our highways every 11 minutes! And, somebody suffered a disabling injury every 18 seconds!

DO YOU KNOW YOUR SIGNS?

REGULATORY
Red & White Group



WARNING
Yellow & Black Group



Service-Guide-Others
Various colors





Where do most of the fatal motor-vehicle accidents occur? In the city, you think? No. In rural areas! In fact, 65% or almost 2 out of every 3 traffic deaths occur in rural areas. On the other hand, motor-vehicle accidents pile up more non-fatal injuries and property damage in the cities.

Of the 5,800 recent accident fatalities among farm residents, 48% or 2,800 involved a motor-vehicle.

If fact, the traffic accident problem is so serious that at the present rate it is estimated one out of every two Americans face the prospect of being injured or killed in a motor-vehicle mishap during his lifetime.

So you see why it is so important, when you reach driving age, to be a safe driver. By operating your car skillfully and according to the rules of courtesy and good sportsmanship, you will automatically shoulder the responsibilities which go with your privilege of driving.

The best way to get the proper skill for driving is through training in a driver education course. If such a course is offered in your high school, enroll as soon as you become eligible. If it is not offered there, ask your parents to help you get the proper, approved training. In any event you should not start driving until you have been properly trained.

Knowing how to handle a car is all well and good, but there is something else a good driver must have — a knowledge of the rules of the road. This means you must learn and understand the laws about speed, passing, stopping, turning, signalling, right-of-way, parking, and similar traffic regulations.

Not only is this knowledge absolutely necessary to pass a driver's license examination, but also to pass the test of everyday driving.

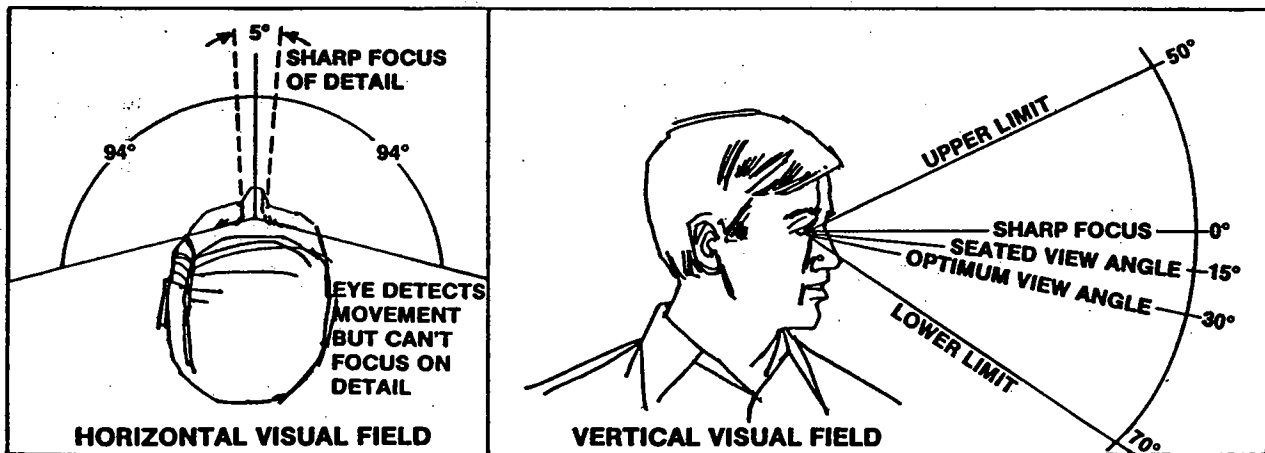
Knowledge of the rules of the road, and the skill of handling a car are key factors in good driving. But better and safer driving also depends upon care, courtesy and caution. In other words, it is achieved by proper driving attitudes which are not defined by law.

A highway safety expert would define it as a willingness to assume responsibility, to respect the traffic laws, to have proper consideration for your fellow driver, and to show a general spirit of cooperation on the road.

In fact, are not these the very same basic qualities that describe a good 4-H'er in all other areas of activity?

A good attitude can be said to extend to just about everything you do when you drive. Even to a rather simple thing like allowing yourself enough time to reach your destination so you won't have to drive faster than you should. It also extends to the duty of keeping your car in a safe operating condition at all times.

Practicing highway safety isn't hard. In driving as in everything else, learning to do things the right way is just plain common sense. It really pays off, too. If you try to do the things discussed in this section — both in pre-driving experiences and after you take the wheel of a car — you will be doing your part.



The normal field of vision is about 188 degrees but the angle of focused vision is narrow. When driving, the eyes should be moved constantly to pick up details both on and off the road.

