



CHAPTER 12

Light and Weather Conditions

Good drivers are prepared for any kind of light or weather conditions. It is important for you to understand how to manage visibility, time, and space in order to minimize the risk caused by poor light or inclement weather.

LESSON ONE

Driving Safely in Low Light and at Night

LESSON TWO

Visibility, Bright Light, and Glare

LESSON THREE

Minimizing Risk in Rain and Snow

LESSON FOUR

Other Hazardous Weather Conditions

OBJECTIVES

1. Describe how visibility is affected by low light conditions.
2. Explain how to drive safely in low light and at night.

KEY TERM

overdriving your headlights

Driving Safely in Low Light and at Night

Your ability to see is decreased at night and just before **sunrise** or after sunset. As visibility decreases, your risk of being in a **collision** increases. To lessen risk, you must understand how reduced light **limits visibility** and how to better manage the driving task in low light conditions.

How Do Low Light Conditions Affect Visibility?

Your ability to see and to be seen diminishes when **the amount** of available light is lessened.

Reduced sunlight during dusk and dawn **hours** makes it difficult to see the roadway and vehicles traveling on it. **Other drivers** as well as pedestrians have difficulty seeing your vehicle, **particularly** if you don't have your headlights on.

Night driving presents special challenges. At night, **darkness** limits your view of the road ahead and the surrounding area. Even with your headlights on, your ability to see ahead when turning or driving around a curve is severely reduced. In addition, the glare of other vehicles' headlights can be distracting—or blinding.

TIPS**FOR NEW DRIVERS**

More Suggestions for Dealing with Visibility Problems at Night

Slow down. Remember that your visibility is limited. Avoid looking directly into the headlights of oncoming vehicles. When necessary to maintain your bearings, glance down at the right edge of your traffic lane beyond oncoming vehicles.

To remind an approaching driver that his or her high beams are on, quickly switch your own headlights from low to high and back again.

If you can, adjust your rearview mirror for night driving to cut glare from the headlights of vehicles behind you.

If you must stop along the road, use your emergency flashers to enable other drivers to see you.

Watch for animals, joggers, bicyclists, and obstacles in the road.

Always remove sunglasses once the sun sets.

How Can You Drive Safely When the Amount of Light Is Low?

To drive safely in low light conditions, you must **maximize visibility** and manage time and **space wisely**.

When your view of the road is limited, slow down. **Maximize your ability** to see

and maneuver. Drive with your headlights on whenever you drive, day and night. Your headlights and taillights help illuminate your vehicle, making it easier for others to see you in all kinds of light.

During Dusk and Dawn Hours

All states require that you use your headlights either from sunset to sunrise or between a half hour after sunset and a half hour before sunrise. Using your headlights makes it easier to see and be seen in the dim light of dusk and dawn. Do *not* use your parking lights. They are not designed to light the road ahead but to indicate your position when you are parked safely off the roadway.

At dawn or dusk, increase the distance between your vehicle and the one ahead, and use your turn signals well in advance.

At Night

Night driving requires extra concentration and a greater level of awareness. With darkness limiting visibility, it is wise to drive more slowly at night than you do during the day and to leave more distance between your vehicle and the vehicle ahead.

Use low beams and high beams correctly. On very dark roads with no other vehicles around, use your high beams to increase visibility. Be sure to switch back to low beams as soon as you spot the headlights or taillights of a vehicle ahead of you. The glare of your high beams can momentarily blind another driver.

Do not overdrive your headlights. At night, drive at a speed that will allow you to stop within the range of your lights—that is, within the distance you can see. Driving faster than that is called **overdriving your headlights** and makes you vulnerable to unseen hazards.

Use the 3- or 4-second rules you have learned to help you judge a safe following distance.

Look beyond your headlights. Get into the habit of looking for objects just beyond your headlight beams to see possible threatening conditions. Looking beyond your headlights is essential when making turns or rounding curves.

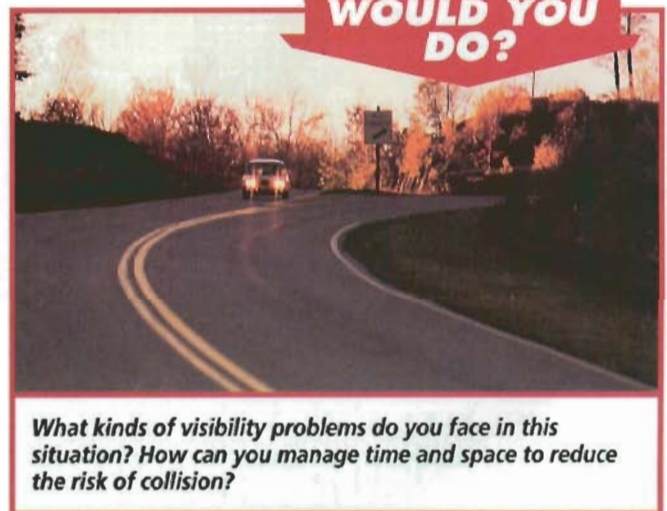
Lesson 1 Review

1. Describe how visibility is affected by low light conditions.
2. What can you do to minimize risk when driving at night?

FYI

Fifty percent of all teenage motor vehicle fatalities occur between 9 P.M. and 6 A.M.

WHAT WOULD YOU DO?



OBJECTIVES

1. Describe the conditions that create glare from the sun.
2. Explain how you can drive safely in the glare of the sun.

Visibility, Bright Light, and Glare

Think of a bright summer morning. The sky is cloudless and everything is bathed in sunlight. That's a pretty picture for a day at the beach, but it's not always so pretty when you're behind the wheel of a vehicle. The glow of that sunlight can turn to dangerous glare.

What Conditions Create Glare from the Sun?

Sunlight increases visibility, but the glare caused when the sun hits your windshield can act in the opposite way—it can reduce your ability to see. The sun's glare is most dangerous at certain times.

In the morning or late afternoon, for example, when the sun is low on the horizon, glare can make it hard to see the road ahead. Glare can also reduce your ability to see the brake lights of other vehicles, especially if you're driving toward the sun and its rays shine directly in your eyes.

◆ *Glare decreases visibility and causes you to become more easily fatigued.*



How Can You Drive Safely in the Glare of the Sun?

As in all driving situations, advance preparation can help you minimize the risk of glare. As part of your predriving check, you should always make sure that your vehicle's windshield is clean. As part of your overall vehicle maintenance, you should replace the windshield if it is badly scratched or pitted. Glare is worse through a dirty or scratched windshield.

Have sunglasses handy. As soon as you begin to squint, slip them on to shield your eyes. Reduce speed, increase your following distance, and adjust your sun visor to block out the sun. However, be careful that the visor does not hinder your view of overhead signs and signals.

Use the SIPDE process to help you manage risk in glare situations. Give yourself an extra margin of safety by leaving more distance between your vehicle and other vehicles. Check carefully for pedestrians—remember, they are having trouble seeing too. Even if you have your sunglasses on and can see road signs and signals, keep in mind that others on the roadway may not be able to see as clearly. Always be alert for the sudden, careless, or unsafe actions of other drivers and pedestrians.

Keep in mind that if you are having trouble seeing, so are the drivers around you. The sun shining on the back of your vehicle may make it very difficult for the driver behind you to see your brake lights or directional signals. For this reason, it's wise to tap the brake pedal to flash your taillights, to use your turn signals well in advance, *and* to use hand or arm signals as well to communicate your intentions.

Keep in mind, too, that when the sun is behind you, oncoming drivers have the sun's glare in *their* eyes and may have trouble seeing you. Drive with your low-beam headlights on to make your vehicle more visible, and signal well in advance your intention to turn or change lanes.

Lesson 2 Review

1. Describe the circumstances in which the sun's light can create dangerous glare.
2. What steps would you take to minimize overall risk in a glare situation?



◆ *The reflection of sunlight off snow and ice causes wide areas of glare.*

WHAT WOULD YOU DO?

The sun is shining behind you. What can you do to minimize risk for both yourself and the drivers behind and ahead of you?

Allow an extra margin of safety. Drive more slowly and leave extra space between your vehicle and other vehicles.

On a wet pavement, drive in the tracks of the vehicle ahead of you. Those tracks are drier than the surrounding surface and offer better traction.

Give other drivers plenty of advance notice. When you intend to slow down or turn, communicate your intentions early so that other drivers have time to react accordingly.

Be alert. Be on the watch for pedestrians dashing for shelter, or with umbrellas restricting their view of traffic.

Keep your low-beam headlights on. Increase the distance you can see, and make your car more visible to other drivers and pedestrians.

Ease your way into turns and curves. Avoid sudden acceleration, starts, or stops.

If rain becomes so heavy that even your windshield wipers' highest speed cannot keep up with the downpour, **signal, then pull well off the road** in a protected area and wait for the storm to lessen in intensity. Remember to switch on your emergency flashers so that other drivers can see your vehicle.

You may also need to pull over if, in snow or sleet, your windshield wipers become crusted with ice or if accumulating snow or sleet creates blind areas on your windshield. Use a scraper and brush to remove all of the buildup, and run your defroster before you resume driving.

How Can You Minimize Risk in Snow and Rain?

If you've ever gone sledding, skiing, or ice-skating, you know just how slippery a snow- or ice-covered surface can be. Imagine trying to maneuver a heavy, fast-moving vehicle on such a surface. One way to reduce the level of risk is to postpone driving until the weather clears. Whenever possible, wait until the roads are plowed and sanded or salted before venturing out on them.

Sometimes you cannot postpone a trip. If you do have to drive under snowy or icy conditions, be aware that there is a great danger of skidding. Drive slowly and extremely cautiously. Allow yourself an extra large margin of safety. When you do want to slow down, stop, or turn, maneuver the vehicle gently and gradually.

Keep on hand cold-weather items such as a windshield scraper and brush, a shovel, jumper cables, emergency flares, and gloves.

Energy Tips

Even though snow tires may be necessary during winter months, they reduce fuel economy. Remove them as soon as winter is over.

SAFETY TIPS

If you are approaching a large vehicle on a slush-covered roadway, turn on your windshield washers and wipers about 2 to 3 seconds before you meet. This gets the glass wet and will help clean the glass quickly after you pass.

SAFETY TIPS

Avoid using your high beams in heavy rain, sleet, or snow. Under such conditions, light is reflected back into your eyes, decreasing your ability to see.

Anticipate and Prevent Skids

If you change speed or direction gradually and smoothly rather than abruptly, you will minimize the chance of skidding. In Chapter 14 you will learn what to do if your vehicle starts to skid.

Anticipate situations in which skids are likely, and take steps to maintain control of your vehicle. For example, when driving on a wet road when the temperature is near freezing, allow yourself extra time and space to brake and steer. If you're approaching a sharp curve or steep hill, slow down well in advance and keep a firm grip on the steering wheel. When you have to turn the wheel, do so slowly and only as much as necessary.

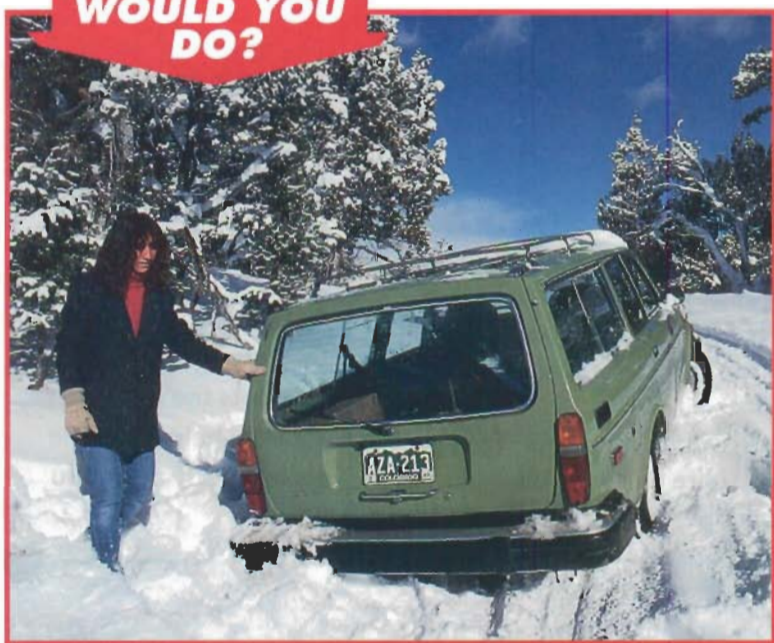
When you know that you'll have to stop for a stop sign or red signal light on an ice- or snow-packed roadway, shift to Neutral and press the brake pedal down gently. Shifting to Neutral helps you brake and prevent skidding by eliminating the thrust effect of the wheels.

Anticipate and Prevent Hydroplaning

During the first 10 to 15 minutes of a rainfall, the roads are at their slickest. This occurs because the rain's moisture mixes with surface dirt and oil to form a slippery film. This film greatly reduces the ability of your tires to grip the road.

Additionally, at speeds as low as 35 mph, the tires of a vehicle can begin to skim along the wet surface of the road, much like a water-skier zipping across the surface of a lake. The vehicle's tires may completely lose contact with the road and be moving on a thin film of water. This is called hydroplaning. Hydroplaning is very dangerous because it severely limits your ability to control your vehicle. To reduce the chance of hydroplaning, reduce speed by about one-third when driving on wet roadways. Be sure your tires have plenty of tread and are properly inflated.

WHAT WOULD YOU DO?



How would you get your vehicle out of the snowdrift?

Lesson 3 Review

1. What strategies can you use to manage visibility, time, and space in rainy or snowy weather?
2. What risks can you anticipate when driving in rain or snow? What steps can you take to minimize them?

Other Hazardous Weather Conditions

OBJECTIVES

1. Describe five hazardous weather conditions other than snow and rain.
2. Understand the risks involved in driving under each condition.

Fog, industrial smog, or a sudden dust storm or sandstorm can diminish the light of a bright, clear day. Strong gusts of wind can blow your vehicle off the road. You can minimize risk under these conditions.

How Can You Minimize Risk in Other Hazardous Weather Conditions?

Just as you must understand and learn how to manage risk when driving in rain and snow, you must also understand and learn how to manage risk posed by other weather hazards.

Fog or Smog

Dense fog poses hazards. Scattered patches of fog may suddenly occur, cutting your field of vision without warning. If humidity is too high, moisture can form on both inside and outside the windshield, further reducing visibility. Turn on the windshield wipers and defogger as necessary.

Low-beam headlights are essential when driving in fog. You may also want to switch on your emergency flashers to further increase the ability of other highway users to see you. Resist the temptation to put on your high beams. The small droplets of water in fog reflect light back into your eyes, making visibility worse with high beams than with low beams.

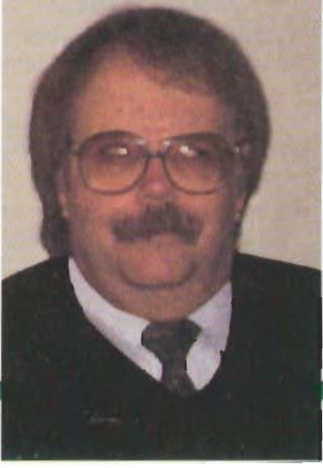
To better manage time and space when driving in fog, reduce speed, increase your following distance, and remain alert for sudden movements.

If fog is very dense, the wisest thing to do is to signal, pull off the road, and wait for conditions to improve. Do not stop on the road. Stop outside a guardrail if possible, and turn off all lights.

In some areas, industrial smoke and other kinds of air pollution create smog that decreases drivers' visibility as much as does fog. Methods described for driving in fog are equally useful for smog conditions.

Sand and Dust

In some parts of the country, sand and dust cause serious visibility problems. In desert areas, for example, these storms can cause a severe decrease in visibility that greatly increases the risk of a collision.



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As you drive you may encounter various conditions that affect your ability to see and operate your car safely. To reduce risk, use your headlights every time you drive and keep them clean and aligned. Be alert to changing environmental and roadway conditions. When buying a car, consider one whose design limits blind spots and whose color enhances its ability to be seen.

Whenever visibility becomes limited, adjust your speed and position to provide more space between your car and other highway users.

If you're caught in such a storm, signal, pull off the road, turn on your flashers, and wait for the storm to pass. If you must drive, use your low-beam headlights, and proceed slowly and very cautiously.

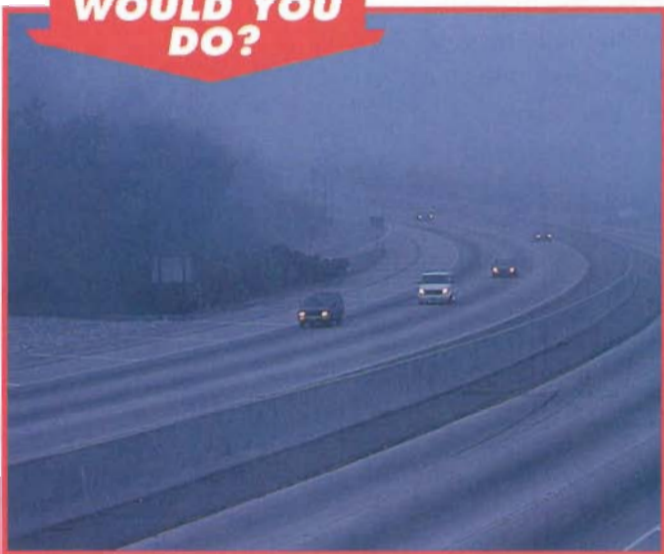
Wind

Depending on the size and weight of the vehicle you're driving, high winds can be a nuisance—or dangerous. Wind can buffet vehicles traveling on a highway like boats tossed in stormy seas. A strong enough gust of wind can actually push a lightweight vehicle right out of its lane!

Under windy conditions, reduce speed and grip the steering wheel firmly to maintain control of your vehicle. Leave extra space between your vehicle and nearby vehicles, especially those that are likely to be affected by the wind, such as vans, recreational vehicles, and vehicles pulling trailers.

Nature is not the only source of wind. When a bus, truck, or tractor-trailer speeds by you—in either direction—you'll feel a powerful blast as it passes. Always allow as much distance as possible to the side between your vehicle and a passing large vehicle. In this way, you can minimize the force of the resulting wind gust.

WHAT WOULD YOU DO?



Explain how you would manage risk in this situation.

Lesson 4 Review

1. What weather conditions other than snow and rain pose dangers for drivers?
2. What risks would you anticipate in these conditions?

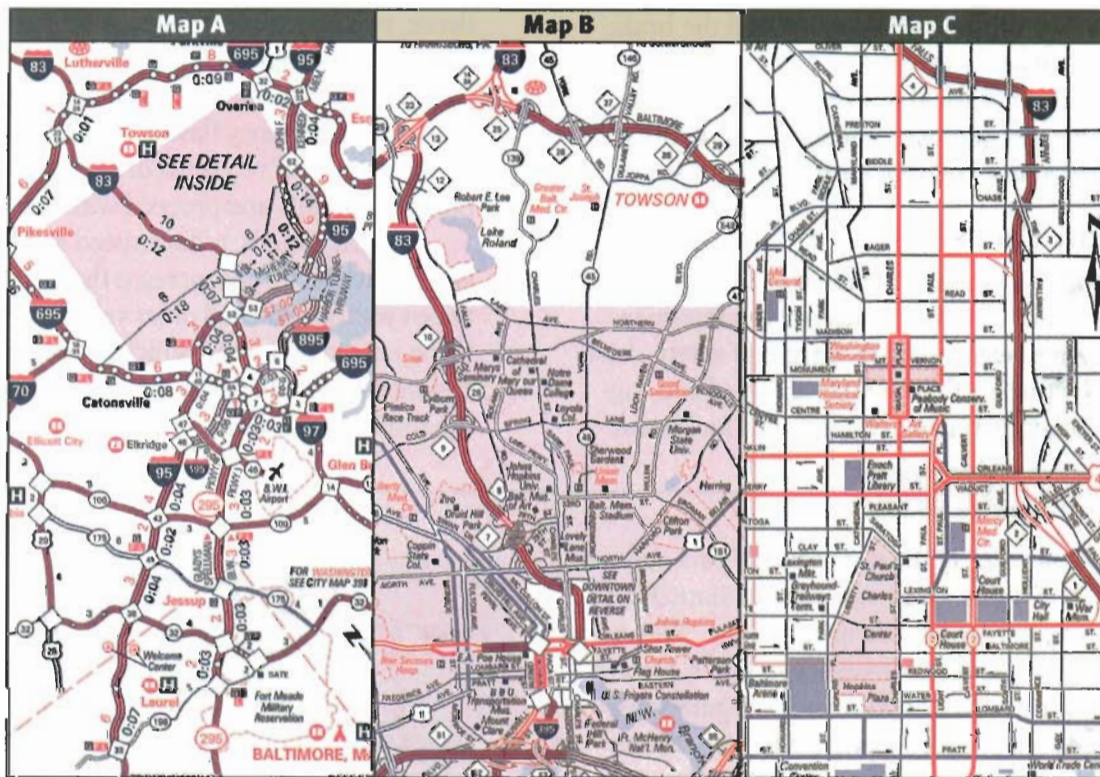
Using a Triptik

A *Triptik* is a continuous series of strip maps in booklet form put out by AAA. A *Triptik* provides detailed routing from one place to another. All you have to do is flip the strips.

The front page of each strip map shows a section of a through, cross-country route and all necessary highway details (Map A). The center-fold contains an area map (Map B). It shows the area surrounding the major route so that you can deviate from the marked route if you choose. The back page ordinarily shows detailed maps of cities along the marked route (Map C).

Try It Yourself

1. On which map would you find the route highlighted for best travel through Baltimore? What route is this? What else does the map tell you about this route?
2. You are at the corner of Bentwood Avenue, heading west on Chase Street. Describe how you would get to the Baltimore Arena. Which map would you use?
3. Suppose you are north of Baltimore, traveling south on Route 83. You want to take Route 45 into the city. Which map would you use? How would you get to Route 45?



CHAPTER 12 REVIEW

KEY POINTS

Lesson One

1. Reduced light during dusk and dawn and at night makes it harder for you to see and harder for others to see you. At night, your view of the roadway is limited, and you have to cope with glare from the lights of oncoming vehicles.
2. When driving in low light, reduce speed, increase following distance, signal turns well in advance, and use your low or high beams as appropriate.

Lesson Two

1. When the sun is low on the horizon, glare makes it hard to see the road and the brake lights of other vehicles.
2. To minimize the risk from sun glare, wear sunglasses and use your sun visor. Reduce speed and increase your following distance.

Lesson Three

1. Steps you can take to manage visibility, time, and space in rain or snow are to prepare in advance, leave an extra margin of safety, drive in the tracks of the vehicle ahead of you, signal other drivers early, keep your low-beam

headlights on, ease your way into turns and curves, and slow down gradually for stops.

2. To **minimize** risk in rain or snow, maneuver the vehicle **gently** and gradually to prevent skids, allow **extra time** for braking and steering, and drive **slowly** to avoid hydroplaning.

Lesson Four

1. Five hazardous **weather conditions** other than snow and rain are **smog, fog, sandstorms, dust storms, and wind**.
2. Fog and smog **decrease** visibility. Keep on low-beam headlights, reduce speed, and increase following distance. If the fog or smog is very dense, **pull off the road and wait** for driving conditions to **improve**.

In a sandstorm or dust storm, pull off the road. Use **emergency flashers** to alert others of your **presence**. If you must drive, use low-beam headlights and proceed **with caution**.

In **heavy winds**, **reduce speed** and grip the steering **wheel firmly**; **increase the distance** between your vehicle and other vehicles. When being **passed by a large** vehicle, allow as much distance as possible to minimize the **force** of the resulting wind gust.

PROJECTS

1. Laws governing the use of headlights and parking lights vary from state to state. Find out what the rules are in your state. Take an informal survey of drivers you know. How many are aware of your state's regulations?
2. Stores sell products designed to help drivers cope with winter driving. Visit a store and evaluate several such products. Which would you buy? Which would you avoid? Why? Discuss your findings with the class.



interNET CONNECTION

Look forward to becoming an experienced driver! Use the Internet to learn more about minimizing risk while driving in poor light and weather.
drivered.glencoe.com

CHAPTER 12 REVIEW

CHAPTER TEST

Write the letter of the answer that best completes each sentence.

- You can lessen the risk of sun glare by
 - opening your sunroof.
 - using your high beams.
 - wearing sunglasses.
- You should keep your low-beam headlights on
 - at all times, day or night.
 - from dusk until dawn.
 - only when you cannot see.
- As visibility decreases,
 - your risk of being involved in a collision decreases.
 - your risk of being involved in a collision increases.
 - the barometer rises.
- Using your high beams in fog can
 - increase visibility by as much as 250 feet.
 - decrease your ability to see.
 - warn other drivers of your approach.
- A dirty or scratched windshield
 - can cause you to skid in bad weather.
 - can worsen the effects of glare.
 - has no effect on glare.
- During dusk and dawn hours, it is
 - more difficult for other drivers and pedestrians to see you.
 - easier to hydroplane.
 - easier to see the roadway.
- To brake safely on a snow-packed road,
 - quickly press the brake all the way to the floor.
 - shift to Neutral and press the brake gradually.
 - shift to Overdrive and press the brake.
- Dense fog can
 - permanently affect the surface of your windshield.
 - cause moisture to accumulate on the inside of your windshield.
 - cause elevated roadways to freeze.
- If you are caught in a sandstorm, you should
 - use your windshield wipers.
 - pull off the road and put on your emergency flashers.
 - use your high beams.
- A car traveling on a wet road at 35 mph can
 - get increased gas mileage.
 - lose contact with the road entirely.
 - develop engine trouble.

Write the word or phrase that best completes each sentence.

sun visor	temperature	smog
hydroplane	windshield	taillights

- When you _____, your car skims along the surface of water on the roadway.
- Your headlights and _____ help illuminate your car.
- One way to avoid glare is to use your _____.
- Air pollution and smoke can create _____, which decreases drivers' visibility as much as fog does.
- Glare caused when the sun hits your _____ can diminish visibility.

DRIVER'S LOG

In this chapter, you have learned how different light and weather conditions affect the driving task. Imagine that the temperature is between 25°F and 35°F and that it is beginning to rain. Write a weather advisory for drivers that gives hints on driving safely in these conditions and what conditions drivers might expect later in the day.