A Message from the Commissioner

Recreation is an integral part of our way of life and snowmobiling has become a very popular winter recreation. Now more than ever it is essential we do all we can to develop safe responsible participation in this winter sport. With proper handling and knowledge this family sport can be enjoyed safely.

Maine is first in snowmobiles per capita in the "snowbelt". Our long winters and scenic wonders have made this state ideal territory for snowmobile buffs.

Your instructor is a volunteer and will teach you basic snowmobile skills. His only compensation is knowing he's helping you become a safe responsible snowmobiler.

This course will make you aware of potential hazards and teach you safe operating procedures but it will be up to you to learn, develop, and practice these skills.

We thank all the volunteer instructors who unselfishly give their time and talents. This program would not be possible without their participation.

Maynard F. Marsh, Commissioner
Department of Inland Fisheries & Wildlife
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Dear Snowmobiler:

The Department of Inland Fisheries and Wildlife hopes you will enjoy reading this manual and benefit from the training course. Your participation in this safety program will help us in our effort to reduce accidents and save lives. This department and other state agencies are working closely with snowmobile clubs statewide towards that end. We encourage all snowmobilers to join a snowmobile club in their area.

Knowledge of the snowmobile and its capabilities, good judgement, respect for the rights of others and care of the environment are important factors in improving the image of snowmobiling. We welcome the opportunity to provide this program to snowmobilers and you may keep this manual and use it for reference.

Thank you for your participation and make a habit of snowmobiling in a safe responsible manner.

Larry Gaudreau, Director
Recreational Safety & Registration

Acknowledgements

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PART I

SNOWMOBILING: AN OVERVIEW
Active sports have built-in risks. One reason sports are exciting is that your body must leave the protection of sitting in a chair. Your body must jump up for a rebound, or balance on one leg, or lean out to turn your snowmobile.

In every sport, you learn and practice skills so that you can completely enjoy the sport. You learn to control your body and your equipment so that you don't hurt yourself. It is worth the time it takes to learn how to do a sport well and safely. After all, snowmobiling is much more fun than sitting in a chair!

Winter sports offer an additional challenge — survival in cold temperatures. For many people, snowy winters mean a long wait indoors until spring. But as a snowmobiler, you can not only survive the winter, but enjoy it. To do this, you need to know how to dress properly, how to use a compass, how to handle emergencies, and how to signal for help.

Snowmobiling is more than a sport. A snowmobile is a vehicle with some of the same power as a car. You need training to drive any vehicle which has the power to hurt you and others around you.

As more people discover snowmobiling, more land is needed for the sport. Other winter sports such as crosscountry skiing and ice climbing also need land. And private landowners may not want to be disturbed by any of these sports enthusiasts. The most important idea to learn from a snowmobile safety class is that you must respect the rights of others, and drive your snowmobile safely, using your body skillfully and your head constantly.
Objectives: Students should be able to:
- Identify reasons for taking a snowmobile safety class.
- Reconstruct the history of snowmobiling.
- Identify reasons for the "bad image" of snowmobiling.
- Compare the noise level of snowmobiles from 1968 to the present.
- Identify the reasons for snowmobiling laws.

Sport and Travel

History and Economic Impact

Since snowmobiles have become so popular in the 1960's and 70's, you might think of the snowmobile as a recent invention. But someone thought of putting a motor on a sled back in the 1920's. In both Canada and the United States, individuals tried to find a fast and inexpensive way to travel on snow.

How would you make a snowmobile in your backyard? Would you put a motor on skis or skis on a motor? Well, here's what some inventors tried. One put a steam engine on skis and runners. Others put skis on automobile frames. Some winterized motorcycles, and others tried propellers. There were some successes, but they were usually too bulky, too expensive, or too limited in their use.

During the 1930's, the designs improved. Today's snowmobiles use the basic ideas of these 1930's machines. Since snowmobiles were used for carrying troops in World War II, people continued to do research to make an even better machine. By 1960, a small, fairly inexpensive machine was available for personal use.

Word got around that snowmobiling could be a sport as well as a way of traveling. People wanted to try one of these snow machines, and soon they wanted one of their own.

More than 60 companies produced well over one million machines by 1970. And, just as with any sport, other industries joined in on making new equipment for snowmobilers. Outdoor clothing added a whole line for the well-dressed snowmobiler. The boom affected insurance and gasoline use too. The new industry made jobs for many people.

Small businesses which service and sell gas or provide food and lodging to snowmobilers have benefited from the growth in popularity of snowmobiling. Much of the snowmobiler's money is spent in rural areas because that is where the trails and roads for snowmobiling are.

Snowmobiling has opened up the winter to many people who used to stay inside. People can now travel many miles on snow with ease and safety. Individuals, families, and groups take to the snow. Trails across public and private land have been developed and maintained for snowmobiling as well as other winter sports. Whenever there's snow, people can take off for a 2-hour outing or a 2-day trip.

Clubs and groups may organize safaris of 100 miles or more. Group travel has become a popular way to stay safe on a long trip. You should remember that the noise level of an individual snowmobile does not reflect the noise of a group. Traveling in groups is a good idea for safety, and is fun. But you should take extra precautions against bothering landowners and other sports enthusiasts.

How the Snowmobile Came To Be
How to Keep the Sport Alive

Snowmobiling grew so quickly that there was not enough time to solve some problems and answer some questions. Do snowmobiles disturb wildlife? Do they harm the land or the plants? Do they disturb other people? Are they dangerous?

These questions were not asked for a long time, and some snowmobilers offended other people by seeming not to care about the answers. Excessive drinking of alcohol, driving recklessly, trespassing, bothering game and farm animals, disturbing other winter sports enthusiasts all contributed to a bad impression of snowmobilers. Many snowmobilers are trying to change this idea.

Since those early days, hard work by the snowmobile industry, clubs, and concerned snowmobilers has drastically reduced the noise of snowmobiles. Quieter machines are a big step forward. Alert and considerate snowmobilers are the next step. Whether the land is public or private, ask before you use a piece of land for snowmobiling. You can help the sport by making sure you are always welcome.

<table>
<thead>
<tr>
<th>Sounds like:</th>
<th>Decibels</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC-6 Plane (inside)</td>
<td>102</td>
</tr>
<tr>
<td>Truck at highway speeds</td>
<td>90</td>
</tr>
<tr>
<td>Car when driver is stepping on gas (at 50 feet)</td>
<td>84</td>
</tr>
<tr>
<td>Conversation (at 3 feet)</td>
<td>70</td>
</tr>
<tr>
<td>Early Unmuffled Snowmobiles</td>
<td>66</td>
</tr>
</tbody>
</table>

Sound Levels Then and Now

Represents the noise level of one snowmobile at wide open throttle at 50 feet away.

Represents the typical noise level of one snowmobile at normal operating speeds of 10-20 mph at 50 feet.

Changes in decibels are not small jumps like inches. When a sound increases by 6 decibels, it is twice as loud. When a sound is lessened by 6 decibels, it is half as loud. On the right-hand side of the chart, the reductions by 50 percent mean that the sound level was cut in half as it went down 6 decibels.

Snowmobile industries have succeeded in making snowmobiles quieter. This chart compares the sound of a snowmobile in 1968 to its sound in 1975.

Sound is measured in units called decibels. You can get an idea of what 90 decibels of sound means by looking at the pictures on the left of the chart. A truck moving at highway speeds makes 90 decibels of sound.

Source: International Snowmobile Industry Association, June 1978
Playing by the Rules

In states where there are snowmobilers, there is usually an agency in the government ready to take care of the snowmobiler's needs. Often, they require snowmobilers to register their machines.

Registration provides for better enforcement of safety rules. If a snowmobiler drives through private property without permission, for example, he may be traced by his snowmobile registration number. Registration makes recovery of stolen machines more likely. If a snowmobiler has an accident and is unconscious, he can be identified through his snowmobile registration. Also, a file of owners can help locate snowmobilers for search and rescue.

Registration fees help pay for developing and maintaining snowmobiling trails and facilities on public lands, including the cost of special signs for snowmobile safety.

The agency also keeps records of snowmobile accidents. They try to figure out why people have accidents on snowmobiles. By knowing the many types of accidents, the snowmobile agency can design safety classes which will help prevent these accidents.

Causes of accidents vary from changing snow conditions to careless driving, but in almost every case, the accident could have been avoided if the driver had used common sense, caution, and good judgment.

Student Activity
Experience Survey

The following questions are meant to find out how much experience related to snowmobiling you have had before taking this class. The answers will help your instructor decide how much time to spend on each part of the course. Circle the letter which best describes your experience.

1. I have (a) driven (b) ridden (c) never been on a snowmobile.
2. I have driven a snowmobile (a) more than 10 times (b) 5-9 times (c) 1-4 times (d) never
3. I have ridden a snowmobile (a) more than 10 times (b) 5-9 times (c) 1-4 times (d) never
4. I have been camping (a) more than 10 times (b) 5-9 times (c) 1-4 times (d) never
5. I have been camping in the snow (a) more than 10 times (b) 5-9 times (c) 1-4 times (d) never
6. I have participated in some winter sport outdoors (a) more than 10 times (b) 5-9 times (c) 1-4 times (d) never
7. I have received (a) certification from a Red Cross first aid course (b) partial first aid training as part of another type of training (c) no first aid training
8. I have repaired machines or vehicles (a) more than 10 times (b) 5-9 times (c) 1-4 times (d) never
9. I intend to use a snowmobile mostly for (a) travel (b) recreation (c) both
10. I intend to use a snowmobile (a) on my own land (b) on public recreation areas (c) on other private land (d) in other states

Your Name
PART II
YOUR SNOWMOBILE
Objectives: Students should be able to:
- Identify the names and functions of the major parts of a snowmobile.
- Identify the control switches.
- Identify the safety features.

The Names of Parts

This chapter is not meant to make you a mechanic but rather to show you some basic repairs in case of an emergency. Before even attempting to drive the snowmobile, read the owner's manual carefully. Be sure you know what all the parts of your vehicle are for.

Following is a list of the most common names of the parts of your snowmobile.

Chassis — the frame, or "backbone," of the vehicle. It is usually made of steel or aluminum. It supports the engine, drive system, and suspension.

Engine — the main power source which operates the drive system. Most snowmobile engines are of the two-stroke design which runs on a mixture of gasoline and oil. (Rotary engines are now available also.) The engine is a lightweight design for power output and easy starting in cold temperatures.

Exhaust system — the exhaust manifold which carries the waste from the engine out through the muffler. The muffler quiets the engine, helps the engine run smoothly, and directs the exhaust fumes away from the engine.

Drive system — a series of turning wheels, chains and belts which change the energy from the engine into the movement of the track. The crankshaft is turned by the power from the piston moving up and down. The primary drive, attached to the end of the crankshaft, turns, making the drivebelt turn. This starts the secondary drive turning, which turns the drive chain around two wheels of sprockets, or teeth, just like a bicycle chain. The lower driven sprocket turns the track which moves the snowmobile. (A new system using a torque converter is also available.)

Suspension system — a series of springs and wheels which keep the bottom of the machine from hitting the ground. It includes the rear axle, springs, and bogie wheels, or slide rails or a combination of both. These combine to keep the track flat on the snow, give a comfortable ride, and make the machine handle easily. It makes the machine "float" over the snow.
Steering system — steering column, tie rods, steering arms, ski columns, ski springs, and skis.

**Steering System**

Hood — a covering for the engine and drive system. Openings called louvers on the hood let air into the engine compartment and let used air out. The windshield is mounted on the hood. Headlights are also attached to the hood.

Instrument panel — a panel containing gauges and some of the controls for the vehicle. Other controls are on the handlebars. The owner's manual will show the location of controls on your particular machine.

**Safety Features**

The following are safety features normally found on most snowmobiles.

- **Safety throttle** — changes the speed of the snowmobile. When pushed down, the machine speeds up; when released, the engine idles.
- **Brakes** — pressure slows down the snowmobile. Braking distances will vary according to snow conditions and speed.

**Safety Features**

Headlights and taillights — required and in operating order.
- **Reflectors** — for easy visibility at night.
- **Pulley and belt guards** — protects operator from sticking hand into moving belt during operation.
- **Windshield** — helps protect face and eyes from wind, snow, debris.
- **Emergency stop switch (kill switch or shut-off switch)** — allows easy shut-off of engine in an emergency.
- **Running board** — a footrest which supports and protects the feet.
- **Passenger grips** — for passenger to hold onto.
- **Snowflap** — prevents stones, ice and other objects from shooting back at other machines that are behind.
- **Safety flag and light** — some machines have an orange fluorescent flag, with or without a light, attached to the back of the machine. A flag is required by law in some states.
Objectives: Students should be able to:
- Describe several maintenance procedures.
- Describe the pre-season check.
- Describe summer storage procedure.
- Identify procedures listed on the troubleshooting chart.

# Maintenance and Repair

Before you attempt any maintenance or repair of your snowmobile, you should review the owner’s manual, and decide just how much mechanical ability you have. Don’t attempt a repair which you do not understand completely. You might end up with a pile of parts and no snowmobile.

If a repair is beyond your ability, you should have a snowmobile dealer or mechanic take care of it for you. It is important to check your machine often, but you should not make adjustments which could endanger you and others when you are driving.

Out on a trail, your snowmobile could have a problem which would stop it completely. For this reason, you should never travel alone.

Here are some suggestions for regular checkups. Refer to your owner’s manual for instructions.

**Drive belt inspection** — If a drive belt needs changing, do it with the engine turned off. Check the drive belt before each trip. Read the owner’s manual carefully if you have to change the drive belt in the field.

**Track tension adjustment** — Your owner’s manual will tell you how much free play there should be in the track. If the track is too loose or too tight, it will wear out quickly. Always check track tension and ski alignment at the same time.

**Ski alignment** — Normal driving may push skis out of line with each other. If your snowmobile pulls in one direction, place the machine on a solid surface and face handlebars straight ahead. Measure the distance between the skis at the front and at the rear. The distances should be equal, or have a \( \frac{1}{4} \) inch “toe-in” at the front of the skis.

**Brake adjustments** — On most machines, about 3/4 inch play on the brake handle is recommended. This prevents brake drag and excessive wear. Check your brakes, because normal wear makes adjustment necessary every now and then. Know the braking distances of any machine you drive.

**Recoil starter** — If you take good care of the starter, it will last a long time. You will shorten its life if you pull the cord to the end and let it snap back.

**General Tune-up**

- **Lubrication** — Lubricate the suspension system. Check bogie wheels or slides for extreme wear. Replace if necessary.
- **Ignition** — Spark plugs are one of the most important parts of snowmobiles. Without them, the machine will not run. One of the main reasons for plug fouling is an improper gas/oil mixture. Be very careful in measuring the right amounts of oil and gasoline.
- **Carburetor** — Follow carefully the instructions in the owner’s manual if you need to adjust carburetor settings.
Pre-season Checklist

Before each snowmobiling season, run through this checklist on your machine. Use the owner's manual if you need help adjusting or replacing parts.

- **Ignition***
  - Replacement of spark plugs
  - Check timing

- **Carburetor*/Fuel***
  - Replacement of fuel filter
  - Adjustment of idle jet
  - Check gas lines and fittings.

- **Drive belt***
  - Check for wear and cracks.
  - Measure old belt and compare to specifications.

- **Track***
  - Examine for broken cleats, loose or torn drive holes, and ply separation.
  - Alignment of track
  - Track tension

- **Skis***
  - Alignment
  - Examine for loose weld joints, loose or worn out wear rods.

- **Chain***
  - Lubrication
  - Examine chain tension.

- **Shocks***

- **Clutch***
  - Lubrication
  - Alignment

- **Brakes***
  - Proper setting
  - Free operation
  - Worn brakes

- **Lights***: replace burned out bulbs.

- **Check for loose nuts and bolts on the sled.***

- **Torque converter***

- **Bogie wheels*/and/or slides***
  - Wheel condition
  - Lubrication
  - Axle wheels and bearings
  - Loose nuts and bolts
  - Broken wheels and springs
  - Slide rails

- **Check spare parts and tools***
  - Light bulbs: pack so they won't break. Always replace with correct type. Incorrect type could damage electrical system.
  - Spark plugs need to be gapped. Check owner's manual for proper setting. In an emergency, a match cover will approximate gap.
  - Spare belt
  - Tools (Pliers, adjustable wrench, screwdrivers: flat and Phillips)
  - Starter pull rope
  - Owner's manual

*See Glossary for description of terms
Summer Storage

Your snowmobile should be placed in storage during the summer. This assures you that when the snow falls again, the machine will be ready to ride with a minimum of preparation.

Fuel
- Refer to owner's manual recommendations.
- Use gasoline stabilizers or drain the fuel left in the fuel tank and carburetor. Then allow the engine to run at idle speed until it stops.
- Remove the carburetor screen and clean it with a solvent.

Engine
- Inject rust preventative oil into cylinders through the spark plug hole. This will prevent rust from forming on the cylinder walls and piston rings.

Chassis
- Loosen track tension.
- Remove drive belt. This prevents distortion during the summer months.
- Rub the bottom of skis and other unprotected surfaces of the vehicle with an oily cloth. Check condition of runners and replace if worn.
- Store in a dry, well-ventilated area with the chassis blocked up so the track is suspended.
- Lubricate all fittings.
- Cover the machine for protection.

Student Activity

By forming teams of individuals or partners, you can use this chart for a contest. One person asks another what might be wrong. For example, the engine speed is low. The other must answer and tell what he/she would do. Score one point for each correct answer.

<table>
<thead>
<tr>
<th>TROUBLE</th>
<th>PROBABLE CAUSE</th>
<th>REMEDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine won't start.</td>
<td>Emergency stop switch depressed</td>
<td>Turn on.</td>
</tr>
<tr>
<td></td>
<td>Ignition switch off</td>
<td>Turn on.</td>
</tr>
<tr>
<td></td>
<td>Spark plug fouled</td>
<td>Clean or replace.</td>
</tr>
<tr>
<td></td>
<td>Improper or no ignition</td>
<td>Check spark plug leads. Check for correct spark plug gap and condition.</td>
</tr>
<tr>
<td></td>
<td>Fuel tank empty</td>
<td>Fill.</td>
</tr>
<tr>
<td></td>
<td>Engine starving for fuel</td>
<td>Prime and check carburetor adjustment. Check choke position. Check fuel pump operation.</td>
</tr>
<tr>
<td></td>
<td>Plugged fuel line or filter</td>
<td>Check lines.</td>
</tr>
<tr>
<td></td>
<td>Engine floods</td>
<td>Clean lines and filter.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check carburetor adjustment and position of choke. Open choke, wait one minute or more before restarting.</td>
</tr>
<tr>
<td>Rewind starter rope does not retract.</td>
<td>Friction too high in starter</td>
<td>Tap starter housing while keeping small amount of tension on rope.</td>
</tr>
<tr>
<td>Rewind starter rope fails to engage or retract. Engine runs rough or will not idle.</td>
<td>Broken or worn parts internally</td>
<td>Use emergency start provisions.</td>
</tr>
<tr>
<td>Low RPM</td>
<td>Carburetor out of adjustment</td>
<td>Adjust carburetor.</td>
</tr>
<tr>
<td></td>
<td>Poor ignition</td>
<td>Follow procedure for &quot;improper or no ignition&quot; above under &quot;engine won't start.&quot;</td>
</tr>
<tr>
<td></td>
<td>Idle speed set too low</td>
<td>Increase idle speed setting.</td>
</tr>
<tr>
<td></td>
<td>Poor ignition</td>
<td>Follow procedure above.</td>
</tr>
<tr>
<td></td>
<td>Carburetor air intake plugged</td>
<td>Remove foreign material.</td>
</tr>
<tr>
<td>Vehicle fails to move when throttle is depressed.</td>
<td>Drive belt worn or broken</td>
<td>Replace drive belt.</td>
</tr>
<tr>
<td></td>
<td>Drive chain out of adjustment or broken</td>
<td>Adjust or replace drive chain.</td>
</tr>
<tr>
<td></td>
<td>Track blocked</td>
<td>Tilt machine on side and remove blockage.</td>
</tr>
<tr>
<td>Low vehicle speed.</td>
<td>Drive belt wrong size or worn</td>
<td>Replace drive belt.</td>
</tr>
<tr>
<td></td>
<td>Clutches out of alignment</td>
<td>Realign.</td>
</tr>
<tr>
<td></td>
<td>Operating on only one spark plug</td>
<td>Follow same procedure as &quot;improper or no ignition&quot; under &quot;engine won't start.&quot;</td>
</tr>
<tr>
<td></td>
<td>Chain and/or track too tight or loose</td>
<td>Readjust.</td>
</tr>
<tr>
<td></td>
<td>Packed snow in vehicle</td>
<td>Remove.</td>
</tr>
<tr>
<td>Lights won't light.</td>
<td>Loose connections</td>
<td>Check and tighten.</td>
</tr>
<tr>
<td></td>
<td>Corroded connections</td>
<td>Clean.</td>
</tr>
<tr>
<td></td>
<td>Bad switch</td>
<td>Repair or replace.</td>
</tr>
<tr>
<td></td>
<td>Bulb burned out</td>
<td>Replace bulb.</td>
</tr>
</tbody>
</table>

CAUTION: If headlight burns out, voltage rise can also burn out taillight.

Do not operate your machine when it is faulty, or with guards or components removed.
Match the name of each part in the left hand column with the best description of the purpose of that part in the right hand column. Place the right letter in the space next to each part.

1. Brake a. Allows steering system to move easily over bumps and dips
2. Windshield b. Transfers energy from engine into movement
3. Drive system c. Speeds up or slows down engine
4. Suspension system d. Ignites the fuel/air mixture to make energy
5. Safety throttle e. Protects face and eyes from wind, snow, debris
6. Snow Flap f. Keeps machine from hitting the ground
7. Spark plug g. Connects primary drive with secondary drive
8. Drive belt h. Mixes fuel and air
9. Ski springs i. Stops snow and ice from hitting others
10. Carburetor j. Slows and stops the snowmobile

Label the parts listed above on the diagram below.
PART III

DRIVING YOUR SNOWMOBILE
Preparation

Now that your snowmobile is ready to go, you are probably ready to get on it and drive. No book can tell you as much as your own practice driving. This chapter will give you some important pointers before you get on your machine: a pre-start checklist, starting the machine, and driving positions.

After you read these pointers, you must practice them. Your experience plus constant attention will help you become a skillful, safe driver.

Chapter 10, Field Practice, will review some driving exercises. Learn the following information well before you test your skills.

Everyone must go through the “beginner stage.” But even seasoned drivers do not know it all. It is a good idea to review these driving points every now and then.

Fueling

Once you make an adjustment on your snowmobile, remember to check it periodically throughout the season. Always check the fuel level before driving. Don’t forget the return trip—do you have enough fuel for the hours of driving you have in mind?

1. Follow the manufacturer’s recommendations for the oil/gasoline mixture ratio.
2. Always use a separate clean container for mixing fuel.
3. When pouring fuel into vehicle tank, use a clean funnel equipped with a fine screen.
4. Do not pour lubricant or gasoline separately into the vehicle’s tank. Whenever it is necessary to mix fuel and lubricant at temperatures below 32 degrees F., the lubricant should be pre-diluted with gasoline so that it will mix better. Some oils are already pre-diluted.
5. Never check fuel level with a match. The explosion could be fatal.

Pre-start Checklist

Before every trip, pre-start safety check — Point the machine in a safe direction and check:

- Steering system: Does it move easily?
- Throttle: Does it move easily? (Press in and make sure throttle is not frozen in the “on” position.)
- Brakes: Do they stick or bind?
- Headlights and taillights: Do they both work?
- Fuel level: Is it enough for the return trip?
- Nuts and bolts: Are they tightened?
- Track: Is it clear of snow and ice?
- Clothing: Are you dressed properly? (Refer to Chapter 6.)

Before starting the machine, you should do these important things.

- Always tell someone where you are going and approximately when you expect to be back.
- Never go alone. Always use the buddy system. Your life may depend on it.

Starting

Many accidents occur because the driver was not ready to take control of the machine. Remember that if you start the machine, you are responsible for controlling it.

If you have made a careful pre-start check, and your machine is ready to go, then follow these steps to start the snowmobile:

1. Be in a position so that you can control the machine immediately. Usually a sitting or kneeling position is best.
2. Always depress the throttle at least once to make...
sure it is not frozen. It should return quickly to the idle position.

3. Be sure the key is switched to “on.”

4. If the machine is cold, then choke or prime it or both, depending on the machine.

5. If the machine starts electrically, turn the key to the start position. Release the choke as soon as the engine starts.

6. If the machine starts manually, pull the recoil starter slowly until you feel resistance. Then pull vigorously, but do not let the handle snap back.

7. If the engine does not start when the choke is used, but seems ready to start, release the choke so that you do not flood the engine. If you do flood the engine, wait awhile before starting again.

For most snowmobiles, the manufacturer will recommend that the machine be operated at low speeds during the first tank of fuel or the first three to four hours of operation. This will allow the moving parts inside the machine to mesh, or seat themselves. This helps guarantee a longer life for your machine.

Driving a snowmobile is similar to driving a bicycle or motorbike. Balance is kept by shifting your body weight. The throttle and brake also help you to control the machine. It is best to keep as much of the track as possible in contact with the snow. Losing contact cuts down on the stability of the machine. When part of the track is raised off the snow, it is easier to lose control of the machine.

Be prepared to shift your weight quickly to counteract the bumps and dips of the land. You must learn to adapt to differing snow conditions, changes in the terrain, and changing weather.

**Driving Positions**

Sitting, the most common riding position, is also the safest in most cases. Feet should be flat on the running board so they will act like a spring to cushion bumps. Sitting is good because it keeps your weight low and easy to shift. If riding double, use lower speed so that your passenger does not get hurt by the changing terrain. Never take your feet off the running board to use them for turning or stopping.

Kneeling, a good alternate position to rest the body, is not good for high speeds. It has the disadvantage of raising you up so it is harder to balance, and you are less protected by the windshield. The advantage is that you can lean into a hill or steep grade when you come to one.

Standing is a position that should only be used when you need to see better. Knees should be flexed to act as a spring, and speed should be low. Seldom used during regular trail riding, this position does not allow you to gain quick control in an emergency situation. Since standing is very dangerous, it should only be done when absolutely necessary.

Posting is a semi-sitting position with the body off the seat and the feet under the body in a sort of squatting posture, thus allowing the legs to absorb the shocks when traveling over uneven terrain.
5

Objectives: Students should be able to:
- Describe maneuvers for varying terrain and conditions.
- List several safety tips.
- Identify potential hazards.
- Describe procedure for transporting a snowmobile.
- Identify the meaning of snowmobile trail signs.

On the Snow
Driving to Snow Conditions and Terrain

Learn to read and anticipate the snow conditions and terrain ahead.

Deep, fluffy snow requires more power to operate the machine since it sinks deeper in loose snow. You must be on the alert to shift your weight because the snow base is unstable and steering may be difficult. If you are in deep snow, turn in as wide an arc as possible and look for a firmer base.

If you do get “bogged,” and this happens to everyone, do not spin your track as this makes the vehicle sink deeper. Never try to lift the machine out unless there is no other way. Back strain and even heart attacks occur this way. Turn the engine off. If the machine is stuck facing uphill, turn the skis to the side and pull the front end of the machine around to a downhill position, and then drive out.

You can also tramp a clear path ahead of the machine. In the standing position, gently rock the machine as you steadily and slowly apply the throttle. Place your feet on the running board at the opposite end from the end which is stuck. Never place foreign material beneath the track for support.

Hard-packed snow has a more stable base, but can be tricky in drifted areas where the packed snow is not uniform. Unplanned jumps, bumps, or dips are more likely to cause back injury, especially at higher speeds because of the hard base.

Ice is as hard and unyielding as concrete. Use extreme care on ice. Beginners should use a great deal of caution and low speeds. The machine is hard to control and spins are quite common. Fast stops are impossible on ice. To stop, let up on the throttle easily, allowing the machine to coast to a stop. Control is best when you are seated.

Avoid icy slopes. Even on flat land, the track does not grab ice. Going up or downhill can be treacherous on ice. Freezing rain can turn a hard-packed surface into a dangerous area.

Do not venture out onto lakes or rivers without knowing ice conditions. Test the thickness to be sure it is safe. There should be at least eight inches of clear ice. Do not go onto ice at points where streams flow in or out as ice may be thin.

Lake and river ice crack during extremely cold weather. Water seeps up through the cracks and makes slush as it mixes with the snow. The snow on top insulates the slush and keeps it from freezing. Never travel across ice until you have checked for slush. If dark spots appear on your tracks, get off the ice immediately.

The best rule is to avoid waterways. If you must travel on ice, check thoroughly that it is safe.

Surface Slope

Uphill — Lean forward on the machine, preferably in a kneeling or standing position. Provide enough speed to reach the top. In heavy or deep snow, more speed is required. Prepare for any hazards which may be at the top. Do not stop when you are pointed uphill as you may become stuck when you try to start again.

Going Uphill
Going Downhill

Downhill — Loss of control could be the most serious hazard. Always keep the machine under control and be prepared to stop if necessary. Use the sitting position.

Crossing a Sidehill

Sidehill — This position can be very difficult on ice. The kneeling position is best. Always lean toward the hill, placing pressure on the uphill side of the track.

Carrying a Passenger or Towing

Make sure any passenger you carry knows the correct way to ride on a snowmobile. Tell him to keep his feet on the running boards at all times, and his hands on the passenger grips. Never ride more than one passenger on your snowmobile. The machine is only built for one passenger.

Warn the passenger to lean into the turns with you. Go more slowly because a bump can throw the passenger. If you carry a very small child, (this is not recommended) the child should sit in front of the driver and the driver should go very slowly.

You may want to tow children in a snowmobile sled. Use a rigid tow bar, never a rope or wire, so that the sled will not crash if you stop quickly. Sleds should be loaded with the lowest possible center of gravity. All passengers should stay seated, and should get out and walk when crossing roads. Every towed vehicle should have reflectors on the sides and rear, and a safety flag.

When traveling as a group, you must give hand signals to the person behind you. Don't make sloppy signals. Be sure the person behind you can see your signals.

For stop or slow, raise either your left or right hand straight up, reaching high.

Signals

Stop or Slow

For a left turn, point your left hand out straight from your shoulder.

Turn Left

For a right turn, bend your left arm at the elbow so your elbow makes a corner, and your hand points up.

Turn Right

These signals are especially important when safari riding. Stay a safe distance behind the snowmobile ahead of you. When you are making a turn, remember that at a blind corner the noise of your machine may prevent you from hearing another machine coming toward you. Approach turns carefully.

Practice

Here are some ways to practice driving skills.

- Practice at slow speeds. Skills are acquired through practice.
- Practice doing figure 8's on level ground.
- Practice uphill, downhill, and sidehill driving.
- Practice stopping under various speed, snow and terrain conditions.
- Be alert for obstacles that you can see and those that may be hidden.
- Watch experienced drivers and learn from them.
- Practice at reduced speeds until you know just how your machine runs and works.
Safety Tips and Hazards

Night riding is popular for many reasons. It is a good time for people to get together during the week. By the time students are home from school, parents are home from work, and supper is over, it is usually dark out. Also, night riding is different from daytime riding. The stillness of dark trees, especially when the moon is out, is enchanting.

However many accidents occur after dark. There is a great danger of hitting things at night which you might see easily during the day. Here are some tips.
1. Make sure your lights are working well. Never drive any trail without lights.
2. Don't overdrive the machine's headlights. Snowmobile headlights are adequate for reduced speed only.
3. Don't travel on unfamiliar ground at night.
4. Carry a flashlight or flare for emergency signalling.
5. Never drive alone. In case of an accident, another snowmobiler can save your life.
6. Never blaze a new trail at night.
7. Use extreme caution when operating in freezing rain, because goggles may freeze over.

Accident reports show that many accidents happen as a result of colliding with fixed objects such as trees, fences, stumps, rocks, logs, and culverts. Often these objects are partially or completely hidden by snow. If you are not alert, you might hit one of these before you even see it.

Many snowmobile trails are parts of existing road rights-of-way, lanes between fields, or trails in the woods. In all cases other persons might change the terrain in some way without knowing that they are making it dangerous for snowmobiles. Snowfall and drifting can cover culverts, fallen tree limbs, fences, and rocks quickly. If you don't know the area, be smart and take it slowly.

Always be on the lookout for hidden wires, especially in areas that may have been farmed at one time or another. Too many accidents have been caused by running into wires in fields, guy wires next to poles and roads, barbed wire, and chains used as road closures. Particularly in unfamiliar areas, you must drive at a speed which will allow you to stop quickly.

Transporting a Snowmobile

It is best to use a trailer manufactured for transporting snowmobiles. It should have a tilt bed for ease in loading and unloading. The trailer must meet the safety requirements of your state pertaining to lights, hitch, coupling, and safety chains. The towing vehicle should have a heavy duty flasher, and rear view mirrors inside and outside.

A winch is desirable for safe loading, especially for large or heavy machines. Never drive a snowmobile onto the trailer because of the danger of driving "up and over." This could mean damaging the snowmobile, the trailer, the car, and possibly seriously injuring a person. Use a winch to pull the snowmobile onto the trailer. If no winch is available, use plenty of help.

Once the snowmobile is loaded, make sure it is fastened tightly to prevent it from moving in any direction. Use a chain or metal clamp to secure the front end. A chain used with a load tighter is the best way to fasten the rear end. Avoid using rope or rubber tie downs, since they are easily frayed by sharp metal edges and may stretch too far, allowing movement in transit.

Make sure the trailer bed is securely latched after loading. Check it a few times during a long trip. The snowmobiles should be placed on the trailer so there is proper weight on the tongue. Place about 60% of the load weight in front of the trailer axle. This helps to prevent fishtailing, and ensures a smooth trailer ride.

When you are unloading, release all tie downs and keep them in a safe place. Tilt the bed and pull the snowmobile off backwards. If you have a tilt-swivel bed, swivel the bed to a safe angle and pull off forward.

If you use a truck, it must be fitted with a ramp. A winch should be attached to the front of the truck box. Load, unload, and secure the machine just as if a trailer were used.

Do not overload trailers. Check the trailer weight capacity rating. The snowmobile should not extend beyond the sides or over the back of the truck or trailer bed. Check your state regulations.

Some small, light machines will even fit into the back of a station wagon.
Snowmobile Trail Signs

You will encounter these signs as you snowmobile. You should know what they mean.

REGULATORY

STOP SIGN
PURPOSE: to be used along trails prior to a road crossing
SIZE: 12" x 12"
BACKGROUND COLOR: Red
BORDER AND LEGEND: White

PURPOSE: keep Maine scenic
SIZE: 9" x 13"
BACKGROUND COLOR: Green

RESTRICTIVE
PURPOSE: snowmobilers restricted to trails only
SIZE: 5" x 12"
BACKGROUND COLOR: Orange
LEGEND: Black

RESTRICTIVE
PURPOSE: to indicate areas where snowmobiling is not permitted
SIZE: 8¼" x 11"
BACKGROUND COLOR: Red
LEGEND: White

TRAIL

PURPOSE: beginning of trail
SIZE: 9” x 12”
BACKGROUND COLOR: Orange with black

PURPOSE: to indicate an area of danger on the snowmobiling trail
SIZE: 12” x 12”
BACKGROUND COLOR: Yellow
LEGEND: Black

INFORMATION

TRAIL BLAZER
PURPOSE: to reassure the user he is on the trail
SIZE: 5” x 7”
BACKGROUND COLOR: Orange with black border

DIRECTIONAL BLAZER
PURPOSE: to indicate changes in trail direction
SIZE: 9¼” x 12” - 5” x 7”
BACKGROUND COLOR: Orange with black border
LEGEND: Black 5¼” directional arrow

Trail markers are available from the Bureau of Parks & Recreation to snowmobile clubs, conservation commissions and municipalities to mark snowmobile trails on property that they have received permission to use.
Student Activity: True and False Driving Quiz

Decide whether each statement is true or false. Circle the T or the F.

T-F 1. Standing is the safest driving position.
T-F 2. Back injury is more likely on hardpacked snow than in deep powder.
T-F 3. At least 60 percent of the load weight should be placed in front of the trailer’s axle.
T-F 4. When you are going uphill, shift your weight backward.
T-F 5. On a trailer more than half the weight should be in front of the trailer axle.
T-F 6. Figure 8’s are a good way to practice driving.
T-F 7. You can be sure a snowmobile will float over any ice, regardless of how thick it is.
T-F 8. The sitting position is best for traveling downhill.
T-F 9. If your machine gets stuck in the snow, spin the track to dig yourself out.
T-F 10. Choking or priming the engine may be necessary in cold temperatures.

Student Activity: Sign Matching Quiz

Match the sign with its meaning. Place the letter from the correct sign in front of the statement which best describes the meaning of the sign.

A  __  Warns snowmobilers to stay on trail
B  __  Shows snowmobiler he is still on the trail
B  __  Points to a change in the direction of the trail
B  __  Asks snowmobilers to keep Maine scenic
C  __  Shows that the trail is about to cross a road
C  __  Shows the beginning of a trail
C  __  Shows that snowmobiling is not allowed in that area
C  __  Warns of an area needing caution
D  __
E  __
F  __
G  __
H  __
PART IV

WINTER SURVIVAL
Objectives: Students should be able to:
- Identify the proper clothing for snowmobiling.
- Describe the equipment necessary for snowmobiling.
- Describe emergency procedures.

Basic Needs

Clothing

When you venture out into the cold weather, you can't take along every stitch of clothing you own. You have to make the most of the heat within your own body. Checking a wind chill chart will give you an idea of the temperatures to expect.

And, when you load your equipment onto your snowmobile, you don't want it to look like a covered wagon. You have to plan carefully before you leave just what you are going to need, especially for long trips.

A small item such as a compass or first aid kit could make a big difference.

Don't Overload!

You should select the right combination of clothes to stay warm. Your entire trip can be miserable if you don't bring the right ones.

If you dress properly, moisture will evaporate from your body. If you become too hot and your clothing traps the moisture, you will get cold. Clothing should be windproof and water repellent. It should be snug, so that it does not catch in the machine. But it should be just loose enough to permit freedom of movement and to keep your blood circulating.

Snowmobile suits or high thickness suits insulate by keeping warm air next to your body.

Look over the wind chill chart. Read across the top of the chart to find the temperature which you read on the thermometer. Read down the row on the left to find the wind speed, or the highest speed you might be traveling at. Where these two rows intersect, you'll find the temperature that you will feel when you go outdoors.

For example, a snowmobiler traveling 30 mph on a still day when the temperature is plus ten degrees will feel the same effect as though the temperature were a -33 degrees F.

The first layer of clothing should be some underwear which ventilates, or "breathes." Wear any light winter under clothing with special attention to covering arms and legs. Avoid underwear that clings to the body. Beware of tight fitting cuffs and elastic bands that cut off circulation. A couple of light layers work better than one layer.

The second layer of clothing should provide comfort, utility and durability, such as wool shirts and heavy pants.

Headgear should be a cap or some covering over your head and ears. Do not wear long stocking caps or hats which have dangling tassels and can get caught in the machine. An approved helmet with ear protection is essential, but wearing a helmet does not make you a race driver. Avoid the fixed bubble type of face guards as they may frost up. Always keep your helmet strap buckled when you are wearing it.

A face mask is usually not necessary except in extreme cold or if no other face protection is available. A mask helps to reduce the possibility of frostbite. Orlon knit pullover face masks are most commonly used.

Goggles are a must for most types of driving. Goggles protect your eyes against branches, thorns, snow, and cold. Severe eye damage called "snow blindness" can occur because of the bright light reflected off the snow. Goggles should have adequate ventilation to prevent lens fogging. Wear yellow lenses for dull or dark days. Green or smoke (grey/brown) lenses are for bright days. Use clear lenses for night driving so that you can see shadows. Protective lenses can prevent freezing of the eyeballs.

A scarf is not recommended for use while on a snowmobile, because it can get caught in the machinery. If you do use one, be sure to tuck it underneath your clothing so no ends are flying loose. It is better to use a dicky or turtle neck sweater for neck warmth.

<table>
<thead>
<tr>
<th>Wind Chill Chart</th>
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<tbody>
<tr>
<td><strong>Estimated Wind Speed in MPH</strong></td>
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<tr>
<td>Calm</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>10</td>
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<td>20</td>
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<td>25</td>
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<td>35</td>
</tr>
</tbody>
</table>

LITTLE DANGER* (for properly clothed person) INCREASING DANGER** GREAT DANGER***

DANGER FROM FREEZING OF EXPOSED FLESH

*Wind speeds greater than 40 mph have little additional effect.

<table>
<thead>
<tr>
<th>Equivalent Temperature (°C)</th>
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<tr>
<td>10</td>
</tr>
<tr>
<td>5</td>
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<tr>
<td>-10</td>
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<tr>
<td>-30</td>
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<table>
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<tr>
<th>(wind speeds greater than 40 mph have little additional effect)</th>
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<tr>
<td>10</td>
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<td>5</td>
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**DANGER FROM FREEZING OF EXPOSED FLESH**
The outer layer is usually a snowmobile suit, one or two piece, worn over regular sport clothing. One piece suits are the warmest usually because they do not let outside air in. Be sure you buy one piece suits large enough to fit when you are sitting down.

For handwarmers, mittens are the warmest. They should not fit tightly or have a shell that gets stiff when cold. Insulated ski gloves are preferred by some and are okay if you find them comfortable. Some gloves have extra insulation across the knuckles. You should always carry an extra pair of mittens. A light inner glove or liner prevents freezing of skin if you must remove outer mittens to handle small items.

Your feet need some high-bulk socks worn in a good boot. It is always a good idea to have an extra pair on any trip where you are not near home. Be sure your socks do not make your boots too tight because you will cut off the circulation. This is a common cause of cold feet.

Boots must be capable of keeping your feet warm and dry even though you do little walking. Be sure they are not too tight. Most popular are snowmobile boots with nylon tops, rubber bottoms and felt liners.
## Equipment

Some basic tools should be carried in the snowmobile at all times.

- Spark plug wrench
- Adjustable wrench
- Set of open end wrenches
- One or two screw drivers and locking pliers
- Rags and a litter bag

For more on the extra parts you should carry, review Chapter 2.

- Spark plugs
- Light bulbs
- Drive belt
- Owner's manual
- Starter cord

## Emergencies

If your snowmobile breaks down and you are unable to fix it or walk out, it is extremely important to remember that you must conserve energy in order to survive. Seek shelter from the wind and restrict your body movements to reduce sweating. Your machine can be used as a windbreak or as part of a lean-to. Seek shelter in a protected area. An overhanging rock shelf, or a clearing at the base of a tree make ideal shelters.

In a timbered area, you can make a lean-to by placing one horizontal bar between two trees or crotches in upright poles. Lean small branches against the horizontal bar. Interweave branches to thatch the shelter.

Snow banks and deep drifts offer protection possibilities. Dig a snow cave facing away from the wind, slightly larger than your body size. Line with any extra material you may have such as the seat of the snowmobile. A ski from the snowmobile may be used as a digging tool. Place a 6-inch diameter ventilating hole in the top of the cave.

Good planning, systematic maintenance of the machine, and traveling with a companion will eliminate most emergencies. To be better prepared, learn and follow these steps in case of an emergency.

1. Prepare a checklist and consult it prior to your departure.
2. Let someone know where you will be and when you will be back.

Safety equipment is dependent on where and how long the ride will be. A good question to ask is, “Can I get back safely with the equipment I’m taking?” Remember, always be prepared for an emergency. Here are some items to consider.

- Extra key (One could get lost in the snow)
- First aid kit
- Pocket knife (some carry an ax)
- 50 feet of ¼ inch nylon rope
- Extra fuel
- Map, reliable compass
- Waterproof matches
- Candy bars or other high energy food (or a one-day supply of food)
- A pair of snowshoes
- Flashlight
- Flares
- Emergency shelter
- Emergency shelter material (tube tent, tarp,
  Space ® blanket
  Sun-blocking cream

For convenience, you might like to consider some luxury items if you have room to carry them.

- Gas stove

Tarpaulin or tent
- Catalytic heater
- Radio to find out about storm warnings.
3. If a fire is needed, choose a protected spot that is not under overhanging branches with snow on them. Pick small dead branches to get a fire going. Dead brush works well also. Larger dead wood is added after small branches have a good start. Collect enough fuel before dark if you have to spend the night.

4. Do not travel on foot in strange areas at night. Conserve your energy, because it will help keep you warm. Moderate exercise can help circulation to cold limbs, but don’t overdo it. Good judgment and common sense are always necessary to make the best of an emergency. If you become unsure of your location during a heavy snowstorm or blizzard, find shelter and keep warm.

5. If your machine is broken down and needs towing, remove the drive belt for easier towing.

6. In all cases, attend to injuries first, then sit down and calmly think out solutions and possibilities. Panic is your worst enemy.

When and if you decide to remain in one place and allow rescuers to find you, certain steps must be taken.

Cut out these signals. Fold and keep them in your survival kit or wallet. Stamp out a signal in the snow. Make it as large as possible. It should be at least 18 feet high and 3 feet wide so it can be easily seen from the air. Place branches, logs, or rocks along the markings of the signal. This will help increase the shadows, making the signal more visible.

On a sunny day, a signal mirror or anything with a reflecting surface is the best signal you can use. Signal with it as often as possible.

**Facing the Unexpected**

**First Aid**

Most snowmobile accidents include some personal injury. The most dangerous situation occurs when a person is injured and alone, miles from help. But any injury can be dangerous if you handle it unwisely. You may need to care for your own injuries or someone else’s when you least expect it.

In any emergency, be calm, firm, and reassuring to the injured person. Do as much as you can for the injured person, and send others for help. For your own and others’ protection, you should learn basic first aid. Your local Red Cross can give you information about first aid classes.

You can easily make up a first aid kit containing the following materials:

- six band-aids
- two 2-inch compresses
- four 4-inch compresses
- four triangular bandages
- one roll of 2-inch gauze
- one roll of 1-inch adhesive tape

Be sure the container is waterproof. Store it under your seat or in the rear compartment.
Injuries

If a person is slumped over on the snowmobile or lying on the ground, always check for breathing first, then bleeding, then look for other signs of injury. Cuts, frostbite, broken bones, and even heart attacks are possible injuries. Care for shock with any injury.

If a cut is serious, put a compress directly over the wound and bandage it tightly enough to stop the bleeding. If bleeding continues, raise the wounded part so the blood flows away from the wound. If bleeding continues, use the pressure point technique by applying pressure to the brachial (upper arm) or femoral (upper leg) arteries. Learn more about this technique so you can pinpoint the specific areas. Tourniquets should only be used in extreme conditions, such as the loss of a limb. Only think of using one if a person might die without it.

To prevent and identify frostbite, frequent checks of each other’s exposed skin is necessary. Frostbite turns the skin white. Warm the affected area as soon as possible, but warm it slowly. Do not rub the frostbitten part with snow or your hand. Warm pressure against the part is best. Place warm clothing or a blanket over the part, but do not try to warm it too quickly near a fire or heater. Get the victim indoors as soon as possible.

Broken bones can be recognized by the odd positions of the limb or by the victim himself feeling pain. Immobilize the limb by splinting it with a couple of straight sticks, or heavy coat or blanket, one on each side of the limb. Tie with two bandages above and below the break. Never tie directly over the break. If possible, bring the victim by sled. Move any injured part very carefully.

Never move a person with possible spinal injury until the situation is carefully surveyed. Check for the following signs which indicate spinal injury.

- Loss of mobility or sensation. Ask the victim to move his toes, feet, and legs and test his sensitivity to touch. Any loss indicates injury to the spinal cord.

- The location of the injury can be identified with similar checks to the upper extremities.

- Whenever a person has a pain in the back or neck, following an accident of force, consider the possibility of spinal injury.
breathing if you have practiced artificial respiration. Here are the steps.

- Begin immediately.

- Place victim on back. (Do not move him if there is possible back injury. Just make contact with his mouth.)

- Clear mouth of foreign matter or any obstructions.

- Tilt head back so chin is pointed upward. This opens air passage. (Sometimes it is necessary to insert your thumb in the victim's mouth and move his jaw forward, thus clearing the tongue from the back of the throat.)

- Pinch nostrils to prevent leakage of air.

- Place your mouth over mouth of victim and blow air into his lungs. Look for his chest to rise.

- If you are not getting any air exchange, recheck head and jaw position and clear victim's mouth again.

- Breathe at a rate of 12 breaths per minute for adults, 20 shallow breaths per minute for children.

- Between each breath, remove your mouth and look at victim's chest to see it fall.

**Hypothermia**

By dressing properly, you will eliminate most of the causes of hypothermia. Hypothermia is the state when your body is losing heat faster than it can produce heat. Hypothermia drains energy from the body. The only way to stop the drain is to reduce or stop the exposure to the cold.

Early symptoms are uncontrolled shivering, turning to memory lapses and numbness. The internal temperature slides to a dangerously low level. Without treatment, this slide leads to stupor, collapse and death.

The best way to prevent hypothermia is to stay dry. Wet clothing loses about 90 percent of its insulating value. Put on an extra piece of clothing before you start shivering. Wool helps hold body heat even when it's wet.

Watch for these signs of hypothermia: uncontrollable shivering, fumbling hands, frequent stumbling, a lurching walk, vague slow speech, drowsiness, or apparent exhaustion. Since these signs may be hard to spot when driving along on a snowmobile, stop more frequently in very cold weather to check if everyone is warm enough.

Get the hypothermia victim out of the cold as soon as possible. Replace wet clothes with dry ones and put victim in a warm sleeping bag if one is available. Give him warm drinks. (Never give drinks to an unconscious person though.) Try to keep him awake. The best way to pass heat to the victim is skin to skin contact inside a sleeping bag.

Always check for hypothermia when a person is immobilized for any length of time by another injury.

**Heart Attack**

Even if you think you would never have a heart attack, you might be with someone who does particularly if they foolishly try to lift a snowmobile alone. The symptoms are shortness of breath, pains in chest and upper arms, bluish color of lips and around finger nails, and swelling of the ankles. Sometimes people have a pain in the upper abdomen, and feel nauseous, so they think it is indigestion.

The person who has a heart attack may be under treatment already. Check with the person to see if he has any medication. The most important thing is to keep the patient comfortable. He may not want to lie down because the pain does not allow it, but try to get him to lie down anyway without alarming him. The worst part for the victim is that he may feel he is going to die, and the last thing he wants to hear is your diagnosis that he has had a heart attack. Be tactful and soothing. It is also recommended a course in Cardiopulmonary Resuscitation, CPR, be completed to aid heart attack victims. CPR involves a combination of artificial respiration and manual artificial circulation.

**Shock**

Shock is a condition of poor blood circulation often caused by serious injury. Too many times a victim has been successfully treated for an injury but subsequently dies of shock. To treat for shock: Maintain the body temperature. Protect the victim from wind and cold as much as possible. Lying flat is also the best position if there is an injury to internal organs, to the head, or if there is a fracture to the lower extremities. Keep the person lying down so that blood flows to the head and chest.
Map and Compass

Getting lost may not seem very serious if it only means you return home a little later than expected. But if you become lost so that you are stranded and cold, or if there is an injury which needs immediate help, getting lost can be a tragedy.

When you go out on a snowmobile, it is essential to carry a compass and a good map of the area. Keep your eyes open for blaze marks, cabins, rivers, and other landmarks as you travel. But when darkness or fog covers landmarks it is impossible to know which way to go without a map and compass.

Topographic maps are best because they show the land in three dimensions: north-south, east-west, and elevation. They can warn you of steep areas, valleys, and ridges. A topographic map also tells you the number of degrees between magnetic north (where the compass arrow points) and true north (where the North Pole is.) This number of degrees, called the angle of declination, varies everywhere in the world, so you must know it for your particular area.

To use a compass and map:

1. Place map and compass on a flat surface away from any metal objects.

2. Place the compass on the map so that the north-south line on the compass dial is parallel with the map north arrow or the vertical lines on the map.

3. Turn the map and compass as a unit, until the arrow moves away from north on the compass at the proper angle of declination noted on the map of your area. Now the map and compass are oriented.

4. If you know your location on the map, you can line up a visible landmark with its map symbol, once the map and compass are oriented.

5. If you do not know your position on a map, but you know you are somewhere along a certain line, such as a ridge, or river, or trail, you can figure out where you are along that line. Orient the map to north using the compass (Steps 2 and 3.) Take a bearing on some landmark which you can positively identify, such as a mountain peak.

The line of this bearing will intersect the trail or ridge where you are located. The point of intersection is your location on the map. As you move along in the right direction of travel, continue to take readings to recheck your position.

To find direction using a watch, lay the watch flat with the hour hand pointing toward the sun. Find the point on the watch face which is half way between the hour hand and the 12. That point will be south.

To find direction with a shadow stick, use a stick that is straight and about three feet long. Place it upright in a clear area. With a peg, mark the end of the shadow. Wait 30 minutes. Then place another peg at the end of the new shadow. The line between these two pegs is the east-west line.

If you are in a blizzard or thick fog, and you have no idea where you are, do not wander around, particularly at night. You will waste energy. As calmly as possible, take the steps necessary for survival. Build a shelter, and a fire if you can find the materials. If you must choose between wandering and staying where you are, stay put and keep yourself warm.
Avalanche

In some areas of the country, snowmobilers will be driving in mountainous areas. Since one footstep is enough to start an avalanche, or “snowslide,” a snowmobile is certainly capable of starting one.

The first way to avoid an avalanche is to stay out of areas which are avalanche hazards. Most accidents occur in slab avalanches, where a large area of snow breaks away and slides.

The safest routes are on ridgetops and slightly on the windward side, away from cornices. Windward slopes are usually safer than leeward slopes. If you cannot travel on ridges, the next safest route is out in the valley, far from the bottom of slopes. Avoid disturbing cornices from below or above. Drive to the top of ridges by detouring around cornice areas.

Snowmobiles should not cross the lower part of slopes. Do not drive a snowmobile across especially long open slopes or known avalanche paths. Many potential avalanche hazards will be posted and closed to travel. There is enough danger in unknown areas — don’t risk your life in an area you know to be hazardous. Carry and trail an avalanche cord behind your snowmobile in cornice areas. If you are buried, this brightly colored, lightweight rope will float to the snow’s surface to aid in a quick recovery.

If you are caught in an avalanche, discard all equipment, and get away from your snowmobile. Make swimming motions, trying to stay on top and trying to get to the side of the avalanche. Before coming to a stop, get your hands in front of your face and try to make an air space in the snow as you are coming to a stop.

If you are the survivor, mark the place where you last saw the victim. Search for him downslope of that point. Poke the snow with a sectional probe or stick. You are the victim’s best hope for survival. Don’t desert him and go for help, unless there is someone else there to look for him, or the help is only a few minutes away. After 1 hour, the buried victim has only a 50 percent chance of survival. If one person does go for help, he should mark the route for return.
Student Activity: Survival Quiz

Circle the letter which best completes the sentence.

1. The most important feature of the first layer of clothing is that it
   (a) ventilates
   (b) stays tight around wrists and ankles
   (c) is thick.

2. If a person is injured and not breathing you should
   (a) go for help
   (b) wait and see what happens
   (c) give artificial respiration.

3. Shivering and stumbling are symptoms of
   (a) heart attack
   (b) frostbite
   (c) hypothermia

4. If you are in a blizzard, it is best to
   (a) walk in a straight line
   (b) stay where you are and keep warm
   (c) keep moving to keep warm.

5. For keeping your hands warm, the best thing is
   (a) mittens
   (b) ski gloves
   (c) long wool cuffs.

6. On a trip the most essential thing to take with you is
   (a) tent
   (b) a friend on another snowmobile
   (c) compass and map.

7. If the temperature is 10 degrees F., and the wind is blowing 20 mph, you should
   (a) not go out
   (b) not worry about frostbite
   (c) check frequently for frostbite.

8. For bright days, wear
   (a) dark lenses
   (b) yellow lenses
   (c) clear lenses

9. If someone cannot move his toes after an injury you should
   (a) exercise his toes and legs for him so he stays warm
   (b) consider spinal injury
   (c) consider spinal injury and not move the victim.

10. If a person has a heart attack, you should
    (a) force him to lie down
    (b) try to impress him with the seriousness of his condition
    (c) suggest he lie down and tell him he will be all right.
PART V

SNOWMOBILE REGULATIONS
Maine Registration

Laws are necessary to protect people, property, and snowmobiling. States have different laws covering registration, required equipment, and rules of the road. Your instructor will help you learn the exact laws in your state.

Objectives: Students should be able to:
- Complete a typical registration form.
- Identify state laws which apply to snowmobiling.

APPLICATION FOR MAINE SNOWMOBILE REGISTRATION

IF THIS SNOWMOBILE HAS BEEN ISSUED A NUMBER PREVIOUSLY ENTER NUMBER HERE

TRANSFER (See Instructions On Reverse Side) (CHECK ONE BOX ONLY) Return to Department of Inland Fisheries & Wildlife Division of Recreational Safety & Registration Snowmobile Section - 284 State Street Augusta, Maine 04333

NEW REGISTRATION FEE $11.25

RENEWAL FEE $11.25

ASSIGNED NUMBER

Please send SEPARATE check or money order for fees other than the registration fee. Check or m.o.'s which include fees other than the registration fee will be returned or will cause a delay in processing your registration. DO NOT SEND CASH.

FOR OFFICE USE ONLY

READ INSTRUCTIONS ON REVERSE SIDE

1. New Registration
2. Transfer
3. Renewal
4. Expiration Date

SAMPLE
Rules of the Road

Although snowmobiles usually operate on trails, in some states they are allowed on posted roads. Snowmobilers on roads must use extra caution because cars and trucks are difficult to control on snowy roads. Always give conventional vehicles the right-of-way. You should assume that other drivers cannot see you. Car drivers are so used to looking for cars that they do not even make a connection sometimes when they look right at a snowmobile. Drive as if you cannot be seen.

Crossing Roads
(Remember: Snowmobiles are not designed to operate on bare pavement.)
1. Completely stop your machine before crossing the shoulder or main traveled way of the highway.
2. Yield the right-of-way to all oncoming traffic.
3. Make the crossing only at an angle of approximately ninety degrees to the direction of the highway and at a place where no obstruction prevents a quick and safe crossing.
4. In some states, a snowmobile may cross a divided highway, if the crossing is made only where it intersects another public street or highway.

There is an added danger when crossing railroad tracks. The sound of your machine and others traveling with you may prevent you from hearing the sound of an oncoming train. Check your state laws on road and railroad crossing.

There are restrictions on which roads a snowmobile may travel on if they are allowed on roads at all. Check whether your state allows travel on unplowed roads, on plowed roads in emergencies, on highways during certain times of day, and along the side of roads at certain times of the day. Make a practice of operating your snowmobile on the right hand side of unplowed roads or wide trails. Always veer right when confronted with an accident situation. When stopping for lunch, don’t block the trail.

You may be required to use a safety flag on your snowmobile if you drive on roadways. These flags are of fluorescent orange material and show five feet above the ground. Even if your state does not require one, it is a good idea to use one.

Some safety rules apply to all types of machines or vehicles on roads and highways. You will hear these rules again when you take driver education.
1. Defensive driving: Be prepared for emergencies involving pedestrians, intersections, approaching vehicles and bad weather conditions especially at night.
2. It is against the law to drive while under the influence of alcohol or drugs. Alcohol reduces your body warmth eventually, dims your reflexes, causes drowsiness, and decreases alertness.
3. Obey posted speed laws. Traffic signals apply to all vehicles. At an intersection, know who has the right-of-way. Be sure to signal.

Accidents
The operator of any snowmobile involved in any accident resulting in injuries requiring the services of a physician or death of any person or property damage to the estimated amount of $100 or more, or some person acting for him, or the owner of said snowmobile having knowledge of the accident should the operator of same be unknown, shall immediately by the quickest means of communication give notice of the accident either to the State Police officer or warden of the Department of Inland Fisheries and Wildlife assigned to the area wherein the accident occurred, to the nearest State Police office or to the sheriff’s office within the county the accident occurred, or the office of the police department of the municipality wherein the accident occurred. Failure of such persons to give notice of any accident requiring notice, to the State Police officer or warden or one of the three offices named shall be prima facie evidence that such accident was not reported.
Student Activity: State Law Questionnaire

The chart which follows asks questions about the laws in your state. Your instructor will help you find the laws to fill in the chart. Make sure you know these laws before you go out on a snowmobile. If you travel to other states to enjoy a different terrain, learn that state's laws before you go. Many states will accept a safety certificate issued by another state.

Check the yes or no column for each question. If you check yes, be sure you explain the law under "DETAILS."

<table>
<thead>
<tr>
<th>IN YOUR STATE</th>
<th>YES</th>
<th>NO</th>
<th>DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Is there any agency in state government in charge of snowmobiling?</td>
<td></td>
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<td></td>
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<tr>
<td>2 Is registration required?</td>
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<tr>
<td>3 Is there a minimum age you must be in order to drive a snowmobile alone?</td>
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<tr>
<td>4 Is there a law about chasing animals?</td>
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<td>5 Is there a law about lights?</td>
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<tr>
<td>6 Is there a law about railroads?</td>
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<tr>
<td>7 Cemeteries?</td>
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<td>8 Mufflers?</td>
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<tr>
<td>9 Alcohol or drugs?</td>
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<td></td>
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<tr>
<td>10 Reckless operation?</td>
<td></td>
<td></td>
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<td>11 Speed?</td>
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<tr>
<td>12 Accident reporting?</td>
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Services Provided by the Snowmobile Division
Bureau of Parks and Recreation

Following is a list of services provided by the Snowmobile Division and some of the organizations that receive assistance.

- Provide assistance to interested groups in the formation of snowmobile clubs.
- Provide information manuals to club presidents to assist in the administration of the club activities.
- Provide trail marking kits to clubs, municipalities and conservation commissions to mark snowmobile trails on property they have permission to use.
- Provide technical assistance to interested parties on trail specifications, construction and maintenance procedures.
- Participate in regional meeting October through March, in cooperation with the Maine Snowmobile Association. The purpose of the meetings is to communicate with as many people as possible concerning the activities of the sport.
- Prepare yearly up-date of snowmobile law booklet, for distribution to users, law enforcement officers and others.
- Maintain a film library on snowmobiling for distribution to clubs, schools and other community service organizations upon request.
- Assist in the promotion of snowmobile safety and the fostering of good landowner relations.
- Provide a snow-grooming grant to interested clubs to assist in preparing snowmobile trails for public use. This is set up on a mileage basis and does not require matching monies.
- Provide a grant for construction and maintenance of snowmobile trails to interested municipal and county governments.
- Establish and maintain trails in and around State owned property. (State Parks, Game Management Areas, etc.)
- Negotiate with private and corporate landowners for land use permits to establish snowmobile trails on private property.
- Work closely with state, federal and private land managers to assist and advise them on snowmobile oriented use of this property.
- Maintain a mailing list of all organized snowmobile groups throughout the State and make periodic mailings to them.
- Administer approximately 400 miles of public snowmobile trail.
- Act as coordinating agent in the establishment and maintenance of approximately 600 miles of trail at the municipal and county level. Also provide technical assistance upon request.
- Provide maps of trails in State Parks and private property administered by the State. Maintain communications with industry and State and Provincial snowmobile administrators.

The overall objective of the Division is to be responsive to the needs and desires of the greatest number of people.

Planning a Snowmobile Trail

The first step in planning a snowmobile trail is to identify specific needs. Is it for destination trail riding, to serve local interest or what?

You should investigate the availability of trails in adjoining communities. This could influence the location of part of your trail system. Good trail systems feature a blend of destination type riding, trails to serve a local need for a short trip, scenic routes, etc. Loop trails are also often desirable.

After you have identified the purpose, begin identifying the resources available to you; existing unused roads, pipelines, logging roads, utility right-of-ways, abandoned railroads or any other existing resource in your area.

Next, obtain topographical maps of the area. They will give you a sense of the terrain you will encounter. Trail systems should include varying terrain, not just flat, wide open areas. Be sure to up date road systems on the map, then identify sensitive wildlife areas, tree plantations, heavily populated areas, highways and bodies of water. Taking these conditions into consideration, establish possible routes for your trail on the map.

Once you have identified possibilities for your trail conduct a field examination by walking the path and noting the extent of clearing, grading, bridges or any other construction that would be necessary. At the same time consider the maintenance a particular route would require. If one or more paths look feasible, identify the owners of the land the trail passes over.
Develop a good working relationship with landowners and be sensitive to their special requests. Once you have decided on the routes and obtained the landowner's permission, actual trail preparation can begin.

**Snowmobile Trail Systems Administered by The Bureau of Parks and Recreation**

**Aroostook State Park**—This park has approximately 20 miles of trail. These trails start from the limited parking area on the main entrance road.

**Camden Hills State Park**—This Park offers approximately 25 miles of trail to the snowmobile enthusiast. Ample parking near the park headquarters gives access to two different trails; one is a trek up Mt. Battie with a worthwhile view at the top. The other trail is a longer trip across the park to a shelter in the Tanglewood area.

**Cobscook Bay State Park**—Snowmobilers have access to approximately 25 miles of trail in this park from the 25 car parking lot near the headquarters building.

**Lily Bay State Park**—There is approximately 5 miles of park road available to snowmobilers in this park providing access to Moosehead Lake.

**Mt. Blue State Park**—This park has approximately 20 miles of trail with parking available at the Center Hill headquarters. This is an ideal area for group picnics and outings. It also provides access to the Mt. Blue to Rangeley trail.

**Peaks-Kenney State Park, Dover-Foxcroft**—There are approximately 5 miles of park road open to the snowmobilers. Parking is not provided at this park.

**Rangeley Lake State Park**—There are approximately three miles of unplowed park road which is open to the snowmobiler. It also provides access to Rangeley Lake and the Mt. Blue to Rangeley trail, but parking is not provided.

**Sebago Lake State Park**—This park has 10 miles of trail. Two trail systems are available; one at the day-use area and the other at the camping area. There is no access between them by snowmobile. Parking is available at the maintenance area.

**Areas Other Than Parks Administered by The Snowmobile Division**

**Weld to Rangeley**—This system provides 37 miles of scenic trail between Mt. Blue State Park and Rangeley State Park. Parking is available only at Mt. Blue Center Hill headquarters.

**Squaw Mountain**—This area includes a 25 mile trip around Big Squaw with several additional miles of side trails. It also connects with the Rockwood trail system and the Jackman trails. This trail system has something to offer to those who want to ride a long distance and those who only want a short trip. Ample parking is available at the Squaw Mountain Ski Lodge.

**West Branch, Mattawamkeag River [Island Falls]**—This trail system includes approximately 60 miles of trail in the Island Falls area. It also provides a connection with several additional miles of trail in the area.

**Beddington**—This trail system offers approximately 40 miles of snowmobiling riding. It is a series of old logging roads and travels through scenic open areas and some densely wooded areas. Parking is available at the Forestry Headquarters and the Airline Snack Bar on Route 9 both in Beddington.

**White Mountain National Forest [Evans Notch District]**—The Evans Notch area provides approximately 20 miles of groomed trail with parking available at Hastings and Evergreen Valley. This system of trails provides some of the most beautiful winter scenery around.

In addition to the trail systems administered by the State, several are administered by municipalities with financial assistance from the State. The number of municipalities administering trail systems are too numerous to mention in the space provided.

**Additional Information**

Maps are available for many of the trail systems administered by the Bureau of Parks and Recreation.

A limited number of films are available on a loan basis to clubs, safety instructors, schools and other community service organizations. These films are 16 mm color with sound and cover topics from safety to general snowmobiling.

For further information on films, trail systems, trail markers or maps, contact the Department of Conservation, Bureau of Parks & Recreation, Snowmobile Division, State Office Building, Augusta, Maine 04333. Telephone 289-3821.
PART VI

COURTESY AND ETHICS
Objectives: Students should be able to:
• List several items of the Snowmobiler's Code of Ethics.
• List steps for the proper care of the environment.
• List several items in the "Basic Snowmobiler's Safety Code."

Responsibility

Most of the complaints people make about snowmobilers could be eliminated if all snowmobilers really understood the Snowmobile Code of Ethics. The International Snowmobile Industry Association has publicized this list of goals to strive toward. Try to think about why each one of these points is necessary.

Snowmobile clubs are working hard to improve the image of snowmobiling. Industries are working to make quieter machines. What are you going to do to help?

Code of Ethics

1. I will be a good sports enthusiast. I recognize that people judge all snowmobile owners by my actions. I will use my influence with other snowmobile owners to promote fair conduct.

2. I will not litter trails or camping areas. I will not pollute streams or lakes.

3. I will not damage living trees, shrubs, or other natural features. I will go out only when there is sufficient snow so that I will not damage the land.

4. I will respect other people's property and rights.

5. I will lend a helping hand when I see someone in distress.

6. I will make myself and my vehicle available to assist search and rescue parties.

7. I will not interfere with or harass hikers, skiers, snowshoers, ice anglers or other winter sports enthusiasts. I will respect their rights to enjoy our recreation facilities.

8. I will know and obey all federal, state and local rules regulating the operation of snowmobiles in areas where I use my vehicle. I will inform public officials when using public lands.

9. I will not harass wildlife. I will avoid areas posted for the protection or feeding of wildlife.
10. I will stay on marked trails or marked roads open to snowmobiles. I will not snowmobile where prohibited.

**Care of the Environment**

The popularity of snowmobiles has projected another machine into our surroundings. We might say the snowmobile, like the automobile and outboard motor, is now "a part" of our environment. All human activities produce an effect on the environment. Many scientific studies are being conducted to determine which of the effects produced by snowmobiling are injurious and beyond the environment's ability to recover. One thing is certain, the snowmobile operator will have a greater effect on the environment than the machine itself. Remember, in snowmobiling as in all other recreational activities, the user, while enjoying his sport also has the responsibility not to destroy the area he is using.

Common sense should be your guide. Courtesy should be your watchword. The future of snowmobiling will depend upon how you react to recommended solutions to environmental problems. Without waiting for the results of scientific studies, here are some things you should do now to prevent damage to the environment.

1. Operate your snowmobile only on your own land, in areas open for its use, or on designated trails. Stay on the trails and do not wander from the established route. Report bad conditions to those responsible for the trail and commend them for good trails.

2. Don't operate your snowmobile when there is not enough snow cover to protect ground vegetation. Avoid slopes with little snow cover to prevent development of eroded areas. For safety and protection of the environment, a minimum of 4 inches of snow should be on the ground.

3. Don't attempt to drive close to wild animals so you can get a closer look. Stop your snowmobile, shut off the engine, and make your observations from a distance. Remember it is unlawful to chase any animal. Although you may not intend to chase an animal, the animal may be driven to flight by the sound of your machine. The animal uses valuable energy as it runs, and it needs that energy to survive the winter. Do not make trails to deer or other wildlife areas. Other snowmobilers will follow your trail.

4. Don't remove the factory-installed muffler to install one that makes more noise. The manufacturer of your snowmobile is trying hard, for the betterment of the environment to develop a quieter machine.

5. Avoid litter. Carry home all paper, cans, bottles and other debris. You can carry out anything you can carry in.

6. Honor all no trespassing signs and ask permission to drive on private property other than your own.
condition at the beginning of the winter season and throughout the months of use.

2. Familiarize yourself with the snowmobile you are driving by reading in detail the manual accompanying the snowmobile.

3. Wear sensible, protective clothing designed for snowmobiling.

4. Use a full size helmet, goggles or visor to prevent injuries from twigs, stones, ice chips and flying debris.

5. Avoid wearing long scarves. They may get caught in moving parts of the snowmobile.

6. Know the terrain you are going to ride. If unfamiliar to you, ask someone who has traveled over it before.

7. Know the weather forecast and especially the ice and snow conditions in the area.

8. Always use the buddy system. Never ride off alone or unaccompanied.

9. Do not pursue domestic or wild animals. No true sportsperson would stoop to such conduct. If you see a violation of this rule, report it to the nearest law enforcement officer.

10. If you snowmobile at night, be sure you have a properly operating lighting system on the snowmobile.

11. Drowning is one cause of snowmobile fatalities. When not familiar with the thickness of the ice or water currents, avoid these areas.

**Basic Snowmobile Safety Code**

What you’ve learned in prior chapters will help you become a safe snowmobiler. We have talked about your snowmobile, its operation, maintenance and equipment. You have developed the ability to better handle yourself in emergency situations. Know and practice this “Basic Snowmobile Safety Code.”

1. Be sure your snowmobile is in topnotch mechanical condition at the beginning of the winter season and throughout the months of use.

Minimum safety standards for snowmobiles have been adopted by the Snowmobile Safety and Certification Committee, Incorporated. All machines manufactured after February 1, 1975, which have been tested and have met these standards will have this label attached to the machine. Make sure the label stays on the machine.
Student Activity: Decision-Making Quiz

Think about the following situations. You may wish to discuss them with classmates and your instructor. Decide what you would do in each situation.

1. A few inches of snow have fallen and the ground is covered. It is the first snow of the winter. The field down the street looks very inviting for the first drive of the year. Should you go out on your snowmobile? Why or why not.

2. You are all alone and you see a trail you would like to go up. You do not know who owns the land. What should you do?

3. Your friends come by while you are snowmobiling and they are driving their machines. They show you the beer they have with them and they race around in a circle to show you how much fun they are having. They motion to you to come with them. What should you do?

4. You see a person lying beside his snowmobile in the woods. What are the steps you should take?

5. You meet up with some cross country skiers on a trail. You do not know whether the trail is for snowmobilers or skiers. What should you do?
Objective: Students should be able to:
- Perform practical maneuvers on a snowmobile.
- Demonstrate smooth operating skills.

Field Practice:
Instruction in
Snowmobile Handling

The material you have learned in preceding chapters is of no value if you cannot apply it when operating your machine and if you cannot rely on what you have learned in case of an emergency. Chapter 10 is broken into two parts: instruction in snowmobile handling and performance evaluation.

Your instructor may choose to include these activities in your course.

1. Pre-start safety check. Your instructor will show you how to do this. (See Chapter 4)
   - Steering system
   - Throttle, choke, decompression switch
   - Brakes
   - Headlights, taillights, brake lights (if present)
   - Fuel level
   - Loose nuts and bolts
   - Your clothing
   - Track
   - Safety switch
   - Spark Plug
   - Safety flag (pennant)

2. Trail ride to show:
   - Riding positions and hand signals
   - Turning
   - Approaching road crossings
   - Night conditions
   - Stopping
   - Leaving the machine

The performance evaluation helps the instructor determine your ability to handle a snowmobile safely as you have learned in this class. It includes the following activities.

1. Pre-start safety check.
2. Proper method of starting.
3. Demonstration of riding positions, hand signals.
4. Operation on course, with controlled speed, and a 360° turn to the right and to the left.
5. Road crossing, demonstrating hand signals, stopping machine completely, checking for traffic.

Performance Evaluation

Pass to the left of all flags except FLAG 2.

START

Where terrain permits, course should also test uphill, downhill, and sidehill driving.

FINISH

Simulated railroad tracks.

Simulated crossing two-lane highway.

Simulated crossing four-lane divided highway.

Stop sign.

FLAG 1

FLAG 2

FLAG 3

FLAG 4

FLAG 5
alignement — the proper positioning or adjustment of parts. When the skis are parallel, they are in alignment.

angle of declination — the number of degrees between magnetic north and the North Pole differing according to your location.

bogie wheels — wheels which press down on the track and keep the track in contact with the snow; part of the suspension system.

braking distances — the distance required for a vehicle to come to a complete stop, varying according to the speed the vehicle is traveling at.

carburetor — the part of the engine where fuel and air mix.

choke — a valve which cuts down on the air intake of the engine, making the fuel/air mixture richer; used when the engine is cold.

cleats — pieces which project from the track to make it grip.

cornice — an overhang of snow formed by wind.

decibels — the unit of measure of sound.

directional blazer — a sign showing that the trail runs in a certain direction.

drive chain — the chain which links the secondary drive with a wheel of sprockets which turns the track.

exhaust manifold — a pipe which leads exhaust fumes from the engine to the muffler.

fuel mixture ratio — the proportion of gas to oil which is proper for your engine.

hypothermia — extremely low body temperature brought about by excessive exposure to cold.

idle — the state of the engine when it is running but the machine is not moving.

ignition — the means by which engine fuel is lighted in a cylinder.

informational blazer — snowmobile trail sign which indicates major changes in direction, rest area, stops or hazard area.

insulate — to keep warm by trapping a layer of warm air next to the body.

piston — the part of the engine which is pushed down by the spark from the spark plug.

primary drive — also called the driven clutch; the first wheel turned by the power from the engine.

running board — the footrest which runs along the bottom of both sides of the chassis.

safari — a trip where a group of snowmobilers travel together.

secondary drive — the second wheel turned by the drive belt in the drive system.

shock — a condition of poor circulation brought on by an injury.

shocks — devices that absorb the force of bumps and jarring.

ski touring — cross country skiing, usually done on trails.

snow blindness — temporary blindness caused by exposure to sunlight reflected off snow.

sprocket — a round wheel with metal or plastic teeth which turns the drive chain or track.

throttle — the control which increases or decreases speed found on the right handlebar.

tilt-bed trailer — a trailer which tilts down for easy loading and unloading.

tongue — a rigid bar which extends between the trailer bed and the towing vehicle.

topographic map — a map which shows the shape of the land, including the variations in elevation.

torque converter — power from an engine is transferred to the track through a torque converter; a transmission system.

track tension — the amount of free play, or tightness, of the track.

wear rods — hard metal pieces attached to the bottom of snowmobile skis to aid in steering on hard-packed or icy surfaces.

winch — a crank with a rope or cable wrapped around a drum for pulling a vehicle onto a trailer.

wind chill factor — the drop in temperature which your body feels because of the wind and the speed you are traveling.