

Road Safety Learning Resources for Schools

Aligned with
Manitoba's Health Education/Physical Education Curriculum

Senior 2



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Our special thanks go to all the students and teachers who participated in piloting the materials in the classrooms. Their feedback has contributed immensely to the development of a more teacher/student user-friendly resource package for Manitoba Schools.

Stay Safe at all times,
Paul Allen
Manager, Road Safety Department
Manitoba Public Insurance

GRADE S2

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INTRODUCTION

We are delighted to welcome you and your class to partake in the school-based road safety learning program. This program is a continuation of the Children's Traffic Club, which is now available in day care centres across Manitoba.

Unfortunately, the leading cause of death and injury for children 5 – 14 years of age in Manitoba is road-related. In many instances, simple precautions could have prevented the occurrence and severity of such incidents.

Research studies have shown that children's perceptions and sensory skills may sometimes put them at a disadvantage in traffic situations. In most instances, young children:

- Experience difficulties in judging speed and distance
- Assume that cars can stop instantly
- Have difficulty discriminating the direction of sounds
- Cannot perceive complicated traffic situations
- Think that if they can see a vehicle, then the driver can see them
- Have a lack of well-developed "peripheral vision"
- Concentrate on what interests them the most at a particular time

In order to reduce the potential risks that our children face on the roads, they must be taught to appreciate their role, rights and responsibilities with respect to their safety on our roads and in other related situations. This resource is designed to help educators provide students with the knowledge, skills and attitudes that will enable them to achieve the aforementioned objectives.

The Road Safety Program includes a series of learning activities and accompanying visuals and student worksheets. The learning activities reflect differentiated instruction (see *Success for All Learners*).

A Road Safety Scope and Sequence Matrix is provided. This matrix explains the "fit" between the Road Safety Learning Activities and relevant sections of the *Kindergarten to Senior 4 Physical Education/Health Education: Manitoba Curriculum Framework of Outcomes for Active Healthy Lifestyles*. There is a box in the bottom right-hand corner beside every specific Student Learning Outcome (SLO) that identifies the number of the learning activity or activities that addresses part or all of the SLO.

Teachers are to note that **not** all road safety content may be applicable to every community. Teachers are advised to use professional discretion in the selection of content. It is advisable to check what is taught of road safety in the previous grade.

Suggestions for Assessment are provided for every learning activity. There is a Teacher Road Safety Checklist provided at the end of each grade. This checklist can be used for ongoing observations and to determine student progress for assessment purposes. When planning their assessment, teachers are advised to refer to *Kindergarten to Senior 4 Physical Education/Health Education: Manitoba Curriculum Framework of Outcomes for Active Healthy Lifestyles, Appendix A: Assessment, Evaluation and Reporting*.

Road Safety is one aspect of the Safety General Student Learning Outcome #3 in the Framework document. The time allotted to teach Health Education in the classroom is limited. Curricular connections are provided for each learning activity. It is recommended that teachers use curricular connections in order to cover all the Road Safety Learning Activities. Teachers may wish to use some of the learning activities as Take-Home Activities for students to complete with their families. Road Safety is an ongoing concern and teachers are encouraged to review this topic with students on a seasonal basis.

This Road Safety Program provides teachers with a valuable, user-friendly resource that enhances the teaching of a topic that is important to daily living and active, healthy lifestyles.

**SENIOR TWO
ROAD SAFETY
SCOPE and SEQUENCE**

LEGEND ■

Number(s) of Learning Activity or Activities that address part or all of SLOs.

| Content/ Curricular Connections | SAFETY General Student Learning Outcome (GLO) #3 | Complementary GLOs |
|---|---|---|
| | Specific Student Learning Outcomes (SLOs) | Healthy Lifestyle Practices #5 |
| <p>Knowledge: Strand A Physical Activity</p> <p>5. Alternative Pursuits (Science) a) Selected activities</p> | <p>q K.3.S2.A.5a Determine the safety considerations in selected alternative pursuits (e.g. wear protective equipment, use reflective tape for night time visibility, have first-aid kit available, watch for extreme weather conditions). Activities 1, 2, 3, 4, 5 and 6</p> | |
| <p>Knowledge: Strand B Safety of Self and Others I. Community Supports and Services (Social Studies)</p> | <p>qK.3.S2.B.4 Investigate the contributions self and/or others can make to community/global health and sustainable development (i.e. safe and healthy lifestyle practices, volunteering, reducing, reusing, recycling). Activity 2</p> | <p>Knowledge: Strand D Substance Use and Abuse Prevention 2. Effects of Substance Use (Science) q K.5.S2.D.2 Evaluate the legal aspects and consequences of substance use, abuse and addiction (e.g. drinking and driving, street drugs, inhalants). Activities 1, 5 and 6</p> |

SENIOR ONE
ROAD SAFETY
SCOPE and SEQUENCE

LEGEND

Number(s) of Learning Activity
 or Activities that address part
 or all of SLOs.

| Content/ Curricular Connections | SAFETY General Student Learning Outcome (GLO) #3 Specific Student Learning Outcomes (SLOs) | Complementary GLOs | |
|---|---|--|---|
| | | Personal and Social Management #4 SLOs | Healthy Lifestyle Practices #5 SLOs |
| Skills: Strand A Acquisition of Safety Practices... I. Physical Activity | qS.3.S2.A.1 Apply rules and procedures for safe and responsible participation and use of equipment in selected, specific physical activities and environments (e.g. self-regulation, teamwork, promotion of fair play and inclusion). Activities 1, 5 and 6 | | |

ACTIVITY 1 What Do You Know About Motor Vehicle Driving?

Prescribed Learning Outcomes:

Safety SLOs:

K.3.S2.A.5a Determine the safety considerations in selected alternative pursuits (e.g. driving speed, watch for weather conditions).

S.3.S2.A.1 Apply rules and procedures for safe and responsible participation in selected, specific physical activities and environments (e.g. self-regulation, teamwork).

Complementary SLOs:

K.5.S2.D.2 Evaluate the legal aspects and consequences of substance use, abuse and addiction (e.g. drinking and driving, street drugs, inhalants).

Activity Outcomes:

Students will be able to:

- Describe potential driving risks/considerations facing motor vehicle drivers and passengers.
 - Demonstrate how to access valid health information and health-promoting products and services in the community that support motor vehicle driver and passenger safety.
 - Describe the consequences and legal aspects of substance use and driving.
-

Suggestions for Instruction:

NOTE:

- 1) Students need to be familiar with research skills and Internet use.
 - 2) This activity may take 140 - 180 minutes.
 - 3) The teacher may encourage students to select motor vehicle driver/passenger safety issues relevant to their community.
 - 4) Teachers may refer students to the list of Canadian Traffic Safety Web Sites included in this activity. For a current listing refer to CARSP/ACPSE – Canadian Traffic Safety Web Sites or http://www.cyberus.ca/~carsp/links_ca.htm
 - 5) Teachers are encouraged to preview or prescreen some of the recommended websites to match sample topic(s) and websites.
- Explain to students that this activity will examine students' knowledge of motor vehicle driving issues ranging from safe and legal driving practices, to legal consequences of unsafe driving, to responsible passenger attitudes and behaviours.
 - Introduce Activity 1 Worksheet A1: *Driving quiz*.
 - Ask students to individually complete all the questions.
 - NOTE: Teachers may use shorter versions of the driving quiz, using the first 10, 15 or 20 questions.
 - Once students have completed the driving quiz, display Activity 1 Worksheet A1: *Driving quiz* as overheads.
 - Read aloud each question and briefly discuss, if necessary, before moving onto the next one.
 - NOTE: Use the Activity 1 Worksheet A2: *Driving quiz – Answer key* to provide the correct responses.

- Explain that all motor vehicle drivers and passengers must be aware of potential driving risks. These driving risks can be classified as either risk conditions or risk behaviours.
- Ask students to define:
 - a) risk conditions (Definition: circumstances in the environment, e.g. road surface - wet, gravel, potholes and winter roads, or weather, e.g. rain, fog);
 - b) risk behaviours (Definition: actions by road users, e.g. speeding, drinking and driving, not signalling to turn).

NOTE: See Glossary at the end of the unit.
- Explain to students that in pairs or small groups, they will select a topic, design a few questions they want to learn more about, collect information, and give an oral presentation.
- Have students divide into pairs or small groups.
- Distribute handout Activity I Worksheet B: *Motor vehicle driving/ridership risks*.
- Have the groups of students choose one motor vehicle driving/passenger topic/issue.
- Introduce the Activity I Worksheet C1: *Potential motor vehicle driving/ridership risks* as an overhead.
- Explain that each small group will:
 - 1) select and record topic/issue for their oral presentation
 - 2) design a few questions that will guide their presentation
 - 3) collect information on the questions from different sources.

NOTE: For a current listing refer to CARSP/ACPSER – Canadian Traffic Safety Web Sites or http://www.cyberus.ca/~carsp/links_ca.htm

 - 4) write the bibliographic information on sources used, using MLA style.
 - 5) decide how they will present their topic to the class.

NOTE: Encourage students to use visual aids to accompany their oral presentations.
- Demonstrate how to complete the assignment using Activity I Worksheet C2: *Potential motor vehicle driving/ridership risks - Example*.
- Introduce Activity I Worksheet D: *Sample evaluation of oral presentation* to students so they are familiar with the assessment rubric for this activity.
- Once students are finished, have the groups present their topics to the class.
- Emphasize to students the increased danger of combinations of driving risks, e.g. the more driving risks, the greater likelihood of traffic collisions. For example, the higher the volume of music in the motor vehicle and the more passengers in the vehicle, the greater chance of a traffic collision.
- Have students present “Exit-tickets” that reflect on what they learned.

Suggestions for Assessment:

- Ask students to write reflections in their learning logs such as: account for differences in information observed from various sources used, how their knowledge of a topic/issue has changed.
 - Ask students to explain how they accessed information on their topic.
 - Evaluate other students' oral presentations. A sample assessment rubric is provided in Activity 1 Worksheet D: *Sample evaluation of oral presentation*.
 - Use the Teacher Road Safety Checklist to assess the students' abilities to identify potential road risks/considerations facing motor vehicle drivers and passengers. (See Assessment Tool.)
 - Use the Teacher Road Safety Checklist to assess the students' abilities to access valid, health information and health-promoting products and services in the community that promote motor vehicle driver and passenger safety. (See Assessment Tool.)
 - Use the Teacher Road Safety Checklist to assess the students' abilities to describe the consequences and legal aspects of substance use and driving. (See Assessment Tool.)
-

Cross-Curricular Connections:

- Physical Education/Health Education (personal and social management; healthy lifestyle practices)
 - English Language Arts (explore thoughts, ideas, feelings and experiences; manage ideas and information; comprehend and respond personally and critically to oral, literary and media texts; enhance the clarity and artistry of communication; celebrate and build community)
-

Opportunities for Family/Community Involvement:

- Invite students to share their findings with their friends and siblings.
- Invite students to discuss potential road risks facing motor vehicle drivers and passengers.
- Invite first responders (i.e. police officers, RCMP, Band constables) to talk about potential road risks facing motor vehicle drivers and passengers.

Driving Quiz

Instructions: Complete the worksheet.

Name: _____

1. Which of the following is true?

- a. Pedestrians have the right-of-way at unmarked crosswalks
- b. Pedestrians have the right-of-way at marked crosswalks, which include crosswalks at intersections controlled by traffic lights, school crosswalks and pedestrian crosswalks
- c. Unmarked crosswalks are extensions of sidewalks. No markings or signs are required
- d. All of the above
- e. a and b

2. Driving a vehicle in Manitoba is a:

- a. Right
- b. Privilege
- c. Way of life
- d. Entitlement

3. The most important factor in any driving situation is the:

- a. Driver (you)
- b. Environment (the highway and traffic)
- c. Vehicle
- d. Time of day

4. Which of the following influences your driving actions most?

- a. Your experience
- b. Your age
- c. Your attitude toward driving
- d. Your reaction time

5. Safety demerit points are assessed:

- a. When a driver is convicted of a traffic offence or has an accident for which the driver is at least partly responsible
- b. Only for accidents
- c. Only if the total combined damage resulting from an accident exceeds \$1,000.00

Name: _____

- 6. The most dangerous, unpredictable individuals on our roads who account for about half of all fatalities in Manitoba are:**
- Under age drivers
 - Impaired drivers
 - Older drivers
 - Teenage drivers
- 7. Before changing lanes, check your mirrors for traffic, signal your intention to move and:**
- Accelerate to make the change
 - Check blind spots and adjust your speed as required
 - Decelerate and adjust your speed as required
 - Steer into the lane you wish to change to
- 8. You are coming to a railroad crossing and the crossing signals are flashing. You should:**
- Stop 5 metres away from the nearest track in urban areas, and in rural areas stop 15 metres away from the nearest track
 - Slow down and look for a train. You may proceed if the train is further than 30 metres away
 - Stop 1 metre away from the nearest track in urban areas, and in rural areas stop 5 metres away from the nearest track
 - Stop 3 metres away from the nearest track in urban areas, and in rural areas stop 9 metres away from the nearest track
- 9. Which of these statements is true regarding a school bus with flashing red lights on an undivided highway. You must:**
- Pass slowly
 - Stop at least 5 metres from the bus (regardless of your direction) and remain stopped until the lights stop flashing
 - Slow down
 - Both a and b
- 10. As you enter a school or playground area, you must drive slowly and be prepared to stop. Which statement is true regarding school zones and playgrounds?**
- A speed limit is only in effect if the school grounds are occupied
 - The speed limit is 30 km/h in a school zone
 - It is illegal to pass another vehicle in a school area, within 15 minutes of either the opening or closing of classes or at any time when children are on the school grounds or near the road
 - Passing is not allowed at any time

Name: _____

11. When entering a street, Provincial Road or Provincial Trunk Highway from a private road, lane, driveway or building, you should:

- a. Drive slowly so approaching vehicles and pedestrians can get out of your way
- b. Honk the horn so approaching vehicles and pedestrians can allow you room
- c. Stop and yield right-of-way to all pedestrians and traffic
- d. Disregard pedestrians if there is no sidewalk

12. You and another vehicle are approaching an intersection that has no traffic signs or signals. Which vehicle has the right-of-way?

- a. The vehicle on the left
- b. The vehicle on the right
- c. The vehicle with the greatest speed
- d. The vehicle that enters the intersection first

13. Is it permitted to pass a vehicle using the gravel shoulder?

- a. No, except on an expressway
- b. No, it is illegal and dangerous
- c. Yes, if traffic is backed up
- d. Yes, any time you need to pass

14. You are driving on a narrow rural road and you are about to meet an oncoming vehicle. You must:

- a. Yield if parked cars are on your side of the road
- b. Allow the on-coming vehicle at least one-half of the main travelled portion of the road
- c. Make the other vehicle pull over if you were the first vehicle there
- d. Turn on your headlights to make sure the other vehicle sees you

15. The police have stopped and asked you to provide an alcohol breath sample. If you refuse you may lose your driver's licence for a minimum of twelve months:

- a. Only if you are convicted of driving while under the influence of alcohol
- b. Only if you are convicted of a major traffic violation
- c. Automatically because you have refused to take the test
- d. None of the above are true

Name: _____

16. Defensive driving:

- a. Identifies dangerous driving situations and allows you to take action to avoid an accident before it occurs
- b. Defends against poor drivers by getting ahead of them in traffic
- c. Defends yourself against accidents by being an "assertive" driver
- d. Defends against accidents by driving your vehicle fast enough to stay ahead of traffic congestion

17. When an emergency vehicle (ambulance, fire or police) sounding an alarm and flashing its lights is approaching from any direction, you must yield right-of-way by:

- a. Immediately moving clear of an intersection if you are stopped for a red light or stop sign
- b. Driving as closely as possible to the curb or edge of roadway
- c. Remaining stopped at the edge of the road until the emergency vehicles have passed
- d. All of the above
- e. a and b

18. After alcohol has entered your blood, you can lessen its effects by:

- a. Taking a cold shower
- b. Drinking black coffee
- c. Eating
- d. Waiting it out

19. This sign means:

- a. School area ahead
- b. Children playing
- c. Soccer field ahead
- d. Playground ahead

**20. This sign means:**

- a. Merging traffic
- b. Speed up
- c. Slow down
- d. Right lane ends



Name: _____

21. This sign means:

- a. Road slippery when wet
- b. Icy road
- c. No spinning of tires
- d. Trucks must use low gear



22. This sign means:

- a. Road narrows
- b. No shoulders
- c. Speed zone
- d. Narrow bridge ahead



23. This sign means:

- a. Divided highway ends
- b. Road surface change
- c. Leaving a town, city or village
- d. No U-turns allowed



24. This sign means:

- a. Entering town limits
- b. Two-way traffic ahead
- c. Turn ahead
- d. Road ends



Driving Quiz - Answer Key

Activity 1 Worksheet A2

- | | |
|-------|-------|
| 1. d. | 13. b |
| 2. b | 14. b |
| 3. a | 15. c |
| 4. c | 16. a |
| 5. a | 17. d |
| 6. b | 18. d |
| 7. b | 19. d |
| 8. a | 20. d |
| 9. b | 21. a |
| 10. c | 22. d |
| 11. c | 23. a |
| 12. b | 24. b |

Motor vehicle driving/ridership risks

Activity 1 Worksheet B

Name: _____

- **Risk conditions:**
 - condition of motor vehicle (e.g. be familiar with the vehicle's instruments, gauges and controls; vehicle maintenance)
 - road conditions (e.g. gravel, narrow bridges, winter roads)
 - weather conditions (e.g. rain, snow, ice, poor visibility)
 - physical health of driver (e.g. vision, hearing)
 - other physical conditions affecting a person's driving ability (e.g. fatigue, illness, stress and strong emotions that may affect driving ability)
- **Risk behaviours:**
 - driver's attitudes (e.g. safety-conscious versus risk-taking)
 - substance use/abuse (e.g. alcohol-depressant, stimulants, cannabis)
 - passenger attitudes and behaviours
 - peer pressure (e.g. risk-taking to belong to group, on a dare)
 - driving experience (e.g. years of driving experience)
 - driving distractions (e.g. talking on cell phones, listening to radio, friends in motor vehicle, eating, smoking)
 - undesirable driving traits - aggressive driver behaviours (e.g. tailgating, speeding)
- **Graduated Driver Licensing Program** (e.g. what, why, who and consequences)
- **Seat belt use in Manitoba** (e.g. what, why, who and consequences)
- **Auto theft prevention devices** (e.g. devices, how to combat the problem)
- **Motor vehicle vandalism and the legal consequences**
- **Impaired driving**
- **Technology to fight impaired driving**
- **Defensive driving** (i.e. **S**can, **I**dentify, **P**redict, **D**ecide, **E**xecute)
- **Seasonal driving tips**
- **Merit Mark and Demerit Point Programs**
- **Factors affecting your MPI insurance coverage rates** (See booklet - *MPI Guide to Autopac 2002*)
- **How to handle driving emergencies** (e.g. blow out, skid, emergency braking, right-of-way for emergency vehicles)

Potential motor vehicle driving/ridership risks

Name: _____

Instructions: Complete the worksheet.

TOPIC: _____

| QUESTIONS and INFORMATION FOUND | SOURCES |
|--|----------------|
| | |

Potential motor vehicle driving/ridership risks - Example

Name: _____

Instructions: Complete the worksheet.

| TOPIC: Impaired Driving | QUESTIONS and INFORMATION FOUND | SOURCES |
|---|---|---------|
| <p>1. What does “impaired driving” mean?</p> <ul style="list-style-type: none"> - impaired driving is: driving under the influence of: a) alcohol, b) driver fatigue, c) prescription and non-prescription drugs, or d) illegal drugs - alcohol is the most common form of impaired driving - fatigue is defined in Manitoba as a fatigue-related collision where the human condition is equal to “extreme fatigue” or “fell asleep” - prescription and non-prescription drugs: people taking many drugs need to be aware of possible interactions that can affect their driving ability - illegal drugs affect the driver’s judgement, perception and motor skills | <p>www.mpi.mb.ca/english/rd_safety/bigthree/id_impairment_sources.html</p> | |
| <p>2. What are the statistics on the types of impaired driving?</p> <ul style="list-style-type: none"> - alcohol impairment stats: 36 Manitobans killed in 1998 in alcohol-related collisions - males are 3 times more likely to exceed legal BAC limit than females - driving deaths involving alcohol are nearly 3.5 times more likely to occur at night - most alcohol-related collisions occur on weekends - fatigue impairment stats: 1 -3% of all crashes in Canada due to fatigue (underestimated) on average, 155 drivers are involved in fatigue-related crashes every year - young drivers in the 16-24 age bracket are 6 times more likely involved in fatigue-related crashes than drivers in other age groups - drug impairment stats: just beginning to gather data; recent study in Australia reveal some form of drug impairment present in 25% of all driver fatalities | <p>Same as above</p> | |
| <p>3. What programs in Manitoba address impaired driving?</p> <ul style="list-style-type: none"> - RoadWatch: goal: to reduce impaired driving by increasing the risk of getting caught - Operation Red Nose: alternative to drinking and driving during holiday season (Christmas) - Designated Driver Program: encourages customers of licensed establishments to appoint designated driver, who is provided with free non-alcoholic drinks by vendor - Safe Grad: provide safe graduation celebration | <p>Same as above</p> | |

Sample evaluation of oral presentation

Instructions: Please rate each evaluation criteria using the Scale:

1 = unsatisfactory

2 = satisfactory

3 = very good

4 = excellent

Name: _____

/ 24 Content:

- Presentation well-organized – good introduction, informative, good conclusion
- Evidence of detailed preparation
- Material relevant to topic
- Language appropriate and interesting
- Stayed on topic
- Use of visuals – effective, interesting

/ 24 Delivery:

- All group members involved
- Words spoken clearly
- Rate of speech well paced
- Volume – heard easily
- Made eye contact with audience
- Body language – stood straight and confidently

/ 12 General Impression:

- Informative
- Interesting
- Creative

Total:

/ 60 marks

Canadian Traffic Safety Sites

Un répertoire de sites Internet canadiens traitant de la sécurité routière

The following links point to Canadian web sites that feature some aspect of traffic safety. Our Association would like to provide the most comprehensive list of such sites in Canada.

Consequently, if you know of a site that meets the criteria, and that we have not already listed, please fill out our on-line form and bring your selection to our attention.

Links are listed alphabetically; letter groups may be selected from the following:

Les hyperliens suivants vous permettent d'accéder à des sites Internet canadiens traitant de divers sujets liés à la sécurité routière. Notre association désirerait offrir la liste la plus complète de ce genre de sites au Canada. Par conséquent, si vous connaissez un site Internet qui rencontre ces critères et qui n'est pas inscrit, s.v.p. nous en aviser en complétant notre formulaire électronique

Les hyperliens sont classés par ordre alphabétique. De plus, ils sont groupés et accessibles suivant la première lettre du nom du site Internet

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A

Abbotsford Police Department
Abegweit Driving School Limited
Action Sudbury
Addictions Foundation of Manitoba
Advanced Driving Concepts
Against Drunk Driving, British Columbia
Alberta Centre for Injury Control and Research
Alberta Infrastructure
Alberta Motor Association
Alberta Trucking Association
Alberta Safety Council
Alberta Snowmobile Safety Association
Alcohol Policy Network
AlertDriving.Com
L'Association du camionnage du Québec
Association of Canadian Distillers
Association of Canadian Ergonomists
Association of International Automobile
Manufacturers of Canada
Association québécoise du transport et des routes
Atlantic Provinces Trucking Association
Audi
auto123.com
Automobile Protection Association

B

Bacchus Canada
Belleville Police Service
Better Safe Than Sorry Child Safety Journal
Bicycle Newfoundland and Labrador
Bicycle Safety Tips
Bikers Down
Biokinetics and Associates Ltd.
BMW Canada
BMW Club of Canada Le Club BMW du Canada
British Columbia Automobile Association
British Columbia Injury Research and Prevention Unit
British Columbia Ministry of Transportation
and Highways
British Columbia Safety Council
British Columbia Trucking Association
Brock University, Sleep Research Lab
Brockville Police Service
Burnaby RCMP



- CAA-Québec
- Calgary Police Service
- Canada Safety Council
- Canadian Association of Chiefs of Police
- Canadian Association of Road Safety Professionals
- Canadian Association of Technical Accident Investigators and Reconstructionists
- Canadian Automobile Association
- Canadian Automotive Rescue Society
- Canadian Centre for Occupational Health and Safety
- Canadian Centre on Substance Abuse
- Canadian Coalition on Child Passenger Safety
- Coalition canadienne pour la sécurité des enfants à bord d'une automobile
- Canadian Council of Motor Transport Administrators
- Canadian Council of Snowmobile Organizations
- Canadian Driver
- Canadian Hospitals Injury Reporting and Prevention Program
- Canadian Motor Vehicle Arbitration Plan
- Canadian Vehicle Manufacturers' Association
- Canadian Motorcycle Association
- Canadians For Safe and Sober Driving/ADD
- Canadians for Responsible and Safe Highways
- Canadian Institute for Health Information
- Canadian Institute of Transportation Engineers
- Canadian Street Rod Association
- Canadian Traffic Education Centre
- Canadian Transportation Equipment Association
- Canadian Trucking Human Resources Council
- Canadian Youth Against Impaired Driving
- CANUTEC, Canadian Transport Emergency Centre
- CarClick.com
- Central Island Highway Patrol
- Centre for Transportation Engineering and Planning, University of Calgary
- Chariots.com
- Chatham-Kent Police Service
- CHIRPP Injury Reports
- Citizens for Safe Cycling
- Collision Analysis (Calgary) Ltd.
- Commercial Vehicle Safety Alliance
- Commission des transports du Québec
- Compendium de données sur la mobilité automobile/Automobile Mobility Data Compendium
- Coquitlam RCMP
- C R Tyner and Associates Ltd
- CSA International
- Cycling BC

D

Daewoo Auto Canada Inc
DaimlerChrysler Canada
Dalhousie University DalTech, Vehicle
Safety Research Team
Dangerous Goods, Transport Canada
Delta Police Department
Direction 2006
Discovery.ca Car Safety
Drinking and Driving, Worsley School
Driver Competency Assessment Protocols
Drivers.com
Driving School Association of Ontario
The Driving School Association
of the Americas
Durham Regional Police Service

E

| | |
|---|---|
| École Polytechnique de Montréal, Équipe de Sécurité Routière | Elgie Bus Lines Limited |
| Earning Your Wheels | Elmer the Safety Elephant/Elmer l'Éléphant prudent |
| Edmonton Bicycle Commuters' Society | Environment Canada |
| Edmonton Police Service | Esquimalt Police and Fire Department |
| Éduc'alcool | Extreme Attitudes Against Drinking and Driving |
| Electric Vehicle Association of Canada | |

F

La Fédération des clubs de motoneigistes
du Québec

Fifty-Five Alive/Mature Driving

Ford Motor Company of Canada Limited

Forensic Engineering Inc.

Fredericton Police Department

free2drive

G

General Motors of Canada

Graham Ryan Consulting Ltd.

Groupe de recherche
interdisciplinaire mobilité,
environnement, sécurité

Guelph Police Service

Le Guide de l'Auto

H

Haliburton County Snowmobile Association

Halton Regional Police Service

Hamilton Road Safety Group

Health Canada Child Injury Division

Health in Action

Heavy Duty Distributor Council

Highway Star Magazine

Honda Canada

Hovey Accident Investigation Services Ltd.

Human Factors North Inc.

I

I Promise Program
Infiniti Canada
L'Institut de la sécurité routière
Industry Canada, Automotive and
Transportation Branch
injuryfreezone
Intech Engineering Ltd.
International Road Dynamics Inc.
Insurance Bureau of Canada
Insurance Corporation of British Columbia
Insurance Information Centre of
Canada/Centre d'information en
assurances du Canada
iTRANS Consulting
ITS Canada

J

Jaguar Canada
Joint Program in Transportation,
University of Toronto

K

Kelowna Transportation Division
Kia Canada Inc.
KidSafe Connection
Kids Safety Awareness Society
Kim Richardson Transportation Specialists
Kingston Police

L

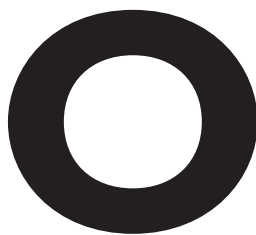
Land Rover
Langley RCMP
Lexus Canada
London Police Service
L-P Tardif & Associates

N

Nanaimo RCMP
National Research Centre, Centre for Surface
Transportation Technology
Nelson City Police
Nepean's Drinking and Driving Site
New Brunswick Department of Transportation
New Brunswick Federation of Snowmobile Clubs
Newfoundland and Labrador Works, Services
& Transportation
Newfoundland & Labrador Snowmobile Federation
Newfoundland Safety Council
New Westminster Police Service
Niagara Regional Police Service
Nissan Canada
Normie's S.T.O.P. Scrap Book
North Vancouver RCMP
Northwest Territories Transportation
Nova Scotia Registry of Motor Vehicles
Nova Scotia Safety Council
Nova Scotia Transportation & Public Works
Nunavut Community Government and
Transportation

M

MacInnis Engineering Associates
Manitoba Cycling Association
Manitoba Highways and Transportation
Manitoba Public Insurance
Manitoba Safety Council
Manitoba Trucking Association
Mazda Canada
Mercedes-Benz Canada
La Monographie Scientifique du Groupe
de Travail Québécois sur les Troubles Associés
à l'Entorse Cervicale/
Scientific Monograph of the Quebec Task Force
on Whiplash-Associated Disorders
Mothers Against Drunk Driving
Motoring 2000



Ontario Association of Chiefs of Police
Ontario Coalition for Better Cycling
Ontario Community Council on Impaired Driving
Ontario Cycling Association
Ontario Federation of Snowmobile Clubs
Ontario Good Roads Association
Ontario Public Health Association
Ontario Ministry of Health and Long-Term Care
Ontario Ministry of Transportation
Ontario Provincial Police
Ontario Traffic Conference
Ontario Trauma Registry
Ontario Trucking Association
Ontario Safety League
Ontario Students Against Impaired Driving
Operation Lifesaver/Opération Gareautrain
Operation Lookout
Opération Nez Rouge
Ottawa-Carleton Safety Council Motorcycle Courses
City of Ottawa Transportation
OttawaRiders.com

P

Pacific Infant/Child Restraint Advisory Committee
Pacific Traffic Education Centre
Peel Regional Police
Penticton RCMP
People Against Impaired Driving
PMG Technologies
Population and Community Health Unit
Porsche Cars North America Inc.
Port Alberni RCMP
Port Moody Police Department
Prince Edward Island Transportation
and Public Works
Prince George RCMP
Prince Rupert RCMP
Private Motor Truck Council of Canada
Project Earth Risk Identification Lifeline (PERIL)

Q

Québec Ministère des Transports
Queen's University, BLEVE Research

R

Race Against Impaired Driving Team
Racing Against Drugs
Rail Safety, Transport Canada/Sécurité ferroviaire,
Transports Canada
Railway Association of Canada/l'Association des chemins
de fer du Canada
R.E.A.L.² (Really Excited About Leadership and Life)
Conference on Traffic Safety
Rick Hansen Institute

Rid Roads of Impaired Drivers
Road Safety, Transport Canada/Sécurité routière,
Transports Canada
Road Safety Educators' Association
Road Watch
Royal Canadian Mounted Police/La Gendarmerie
royale du Canada
Ryerson Polytechnic University, Vehicle Safety
Research Centre

S

Saanich Police Department
Safe Grad Manitoba/Teens Against
Drinking and Driving Manitoba
Safe Kids Canada
Safe Start
Safety on Zones (SOZ)
Saskatchewan Government Insurance
Saskatchewan Highways and Transportation
Saskatchewan Institute on Prevention of Handicaps
Saskatchewan Cycling Association
Saskatchewan Safety Council
Saskatoon Police Service
Scott Bus Lines Limited
SECURE School Bus Safety Program
Smart Risk Foundation
Snap, Buckle, Drive
SNOMAN (Snowmobilers of Manitoba) Inc.
Snowmobile Trail Officer Patrol
Snowmobilers Association of Nova Scotia
Société de l'assurance automobile du Québec
South Island Highway Patrol
Standards Council of Canada
Standing Senate Committee on Transport
and Communications
Stratford Police Service
Street Legal, Edmonton Police Service
Street Legal, Saskatchewan
Students Against Drinking and Driving, Alberta
Students Against Drinking and Driving,
Father Mercredi High School, Fort McMurray
Students Against Drinking and Driving, Saskatchewan
Students Against Drinking and Driving,
St. Mary's High School, Vegreville, Alberta
Subaru Canada Online
Sudbury Regional Police Service
Sumas Highway Patrol
Sunnybrook Health Science Centre Trauma Program
Sûreté du Québec
Suzuki Canada Inc.
Swift Current Regional Highway Patrol

T

Target Risk
Today's Trucking
Toronto Against Impaired Driving
Toronto Police Traffic Services
Toyota Canada
Traffic Injury Research Foundation
Traffic Safety in Alberta
Traffic Safety Information Village
Transport Canada/Transports Canada
Transportation Association of Canada
Transportation Development Centre
Transportation Health and Safety Association of Ontario
TRIMAP Communications Inc.
Truck News

U

UMA Group Ltd.
Université de Montréal, Centre de recherche sur les transports
University of Manitoba Transport Information Group
University of New Brunswick, Transportation Group
University of Saskatchewan, Transportation Centre
University of Western Ontario, Multi-Disciplinary
Accident Research Team

V

Vancouver Island Safety Council
Vancouver Police Department Traffic Services Squad
Vehicle Information Centre of Canada
Velo New Brunswick Cycling Information
Vélo Québec
Victoria Transport Policy Institute
Volkswagen
Volvo Canada

W

Waterloo Regional Police Service
WAY TO GO! School Program
West Vancouver Police
Wheel Monitor Inc.
Winnipeg Police Service
World of Wheels

X

Missing linx !

Y

Young Drivers
Yukon Community & Transportation Services



More missing linkz !

While we try to ensure that the links to Canadian traffic safety sites are current, the Internet is very dynamic and site addresses may change between our verification checks. Please notify our Web Master of any broken links.

Bien que nous nous efforçons de tenir à jour les hyperliens qui permettent d'accéder aux sites Internet canadiens de sécurité routière, l'Internet évolue très rapidement et les adresses des sites peuvent changer entre nos vérifications périodiques. Le cas échéant, s.v.p. aviser notre Maître du site de tout problème rencontré avec les hyperliens.

The Canadian Association of Road Safety Professionals
L'Association canadienne des professionnels de la sécurité routière

<http://www.cyberus.ca/~carsp/acpser.htm>

ACTIVITY 2 Driver Actions and Traffic Collisions

Prescribed Learning Outcomes:

Safety SLOs:

K.3.S2.A.5a Determine the safety considerations in selected alternative pursuits (e.g. driving speed, watch for weather conditions).

K.3.S2.B.4 Investigate the contributions self and/or others can make to community/global health and sustainable development (e.g. safe and healthy lifestyle practices, volunteering, reducing).

Complementary SLOs:

Activity Outcomes:

Students will be able to:

- Identify driver actions that contribute to traffic collisions.
 - Interpret Manitoba traffic collision statistics to determine driver involvement in traffic collisions due to speed.
 - Interpret Manitoba traffic collision statistics to determine correlations.
 - Explain each person's role as a responsible driver in the community.
-

Suggestions for Instruction:

NOTE:

- 1) The teacher may photocopy the worksheets back-to-back.
 - 2) This learning activity can be used during the Data Management and Analysis Unit in S2 Applied Mathematics. It is recommended as an application activity after either an introductory lesson on the topic OR as a final project at the end of the unit.
 - 3) Students need to use a graphing calculator.
 - 4) For teachers and students less familiar with this calculator's operations, a key-by-key instruction sequence is provided. See Activity 2 Worksheet A2: *Keystroke sequence using a TI-83*.
 - 5) The Senior 4 Consumer Mathematics (Manitoba Foundations Document) has a simple lesson on correlation coefficient in the Statistics Unit.
 - 6) This learning activity may take 140 minutes.
- Explain to students that this activity examines driver actions that resulted in traffic collisions.
 - Introduce the topic by asking the students the following True or False questions.

True or False Questions:

- 1) Most traffic collisions are preventable. (True)
- 2) The age group 16-19 years has the lowest reported rate of driving infractions in injury and property damage collisions. (False. This age group has the highest reported rate of driving infractions in injury and property damage collisions.)
- 3) Exceeding the speed limit accounted for almost 25% of the primary at-fault driver actions in the 16-19 year age group. (True)
- 4) "Failing to yield" is a primary driver action in traffic collisions. (True)
- 5) Two hundred Manitobans are injured each year due to speeding. (False. 446 people are injured each year due to speeding.)
- 6) The greatest number of alcohol-related crashes occurs in the winter months. (False. They occur in the summer months - June, July, August.)
- 7) The annual estimated cost of road collisions in Canada is \$5 billion. (False. The annual estimated cost of road collisions in Canada is \$25 billion a year. This cost includes direct and indirect costs as well as estimated costs of pain and suffering.)

Sources: Questions 1-5: Manitoba Transportation and Government Services. *Traffic Collision Statistics Report 1999*.

Questions 6-7: Traffic Injury Research Foundation, www.trafficinjuryresearch.com/faq/faq.htm

- Briefly discuss students' responses.
- Introduce Activity 2 Worksheet A1: *Speed, traffic collisions and driver age* as an overhead.

HINTS:

- 1) Help students understand the structure of the table and the nature of its data. Help students interpret the values in the last 2 rows and express the relationship between them.
 - 2) Explain that questions 1-4 help them interpret the table and critique the structure of the columns of data.
 - 3) For questions 5-6, it is more effective to teach these skills directly using Activity 2 Worksheet A2: *Keystroke sequence using a TI-83*. Introduce students to this worksheet. This worksheet descriptively and visually guides students through the whole process using 1 of 3 rows of data related to speed and traffic collisions. Students can repeat this process using the other 2 rows of data.
 - 4) For questions 7-8, students will need help to identify that if 2 factors are strongly correlated, the relationship between one factor and the other may be *causal* or it may not be.
- Complete the first question on Activity 2 Worksheet A1 as a class.
 - Have students complete question 2 on the At-Fault Gauge individually.
 - Once students have completed it, discuss the results to question 2.

NOTE: Discuss how these results support the idea of a Graduated Driver Licensing Program.

- Ask students to complete the worksheet individually or in pairs.
 - Once students have completed the worksheet, correct and discuss it as a class using Activity 2 Worksheet A3: *Speed, traffic collisions and driver age - Answer key*. Remember answers to questions 6, 7 and 8 will vary and the quality of justification is more important than the students' positions.
 - Optional: Have students form teams to debate one of the suggested issues in questions 7-8.
 - Ask students: "Do the statistics support the need for tougher penalties for drivers who commit driving offences?"
 - Discuss as a class each person's role as a responsible driver in the community (e.g. be a courteous driver: yield to pedestrians and other motor vehicles; drive more slowly in poor driving conditions; signal to change lanes; follow other motor vehicles at a safe distance, which allows sufficient stop time in an emergency and allows for road conditions).
 - Have students ask their parents or an older adult: "What is one situation where you now drive more slowly than when you were young?"
-

Suggestions for Assessment:

- Ask students to name specific driver actions that may result in traffic collisions.
 - Correct the worksheet as a class using Activity 2 Worksheet A3: *Speed, traffic collisions and driver age - Answer key*.
 - Have students present their positions and justifications for questions 7 and 8 (correlation coefficients) on the worksheet.
 - Have students provide multiple explanations for differences in rates across age of speed-related traffic collisions and which factors listed might be personally relevant.
 - Use the Teacher Road Safety Checklist to assess the students' interpretation of Manitoba traffic collision statistics that relate to driver involvement in traffic collisions by speed-related driver actions. (See Assessment Tool.)
-

Cross-Curricular Connections:

- Applied Mathematics (data management and analysis; exploring mathematics using technology)
 - English Language Arts (explore thoughts, ideas, feelings and experiences; manage ideas and information; celebrate and build community)
-

Opportunities for Family/Community Involvement:

- Invite students to share their learning with their friends and families.

Name: _____

Speed, traffic collisions and driver age

Instructions: Complete the worksheet using a TI-83 graphing calculator.

Driver Involvement in Injury and Property Damage Traffic Collisions by Driver Action and Age Group 1999

| DRIVER ACTION | AGE GROUP | | | | | | | | | | TOTAL |
|---|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| | <16 | 16-19 | 20-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75> | NS | |
| Drive Properly | 39 | 3,778 | 4,012 | 6,430 | 6,999 | 5,202 | 2,874 | 1,680 | 971 | 5,327 | 37,312 |
| Follow Too Closely | 1 | 158 | 146 | 135 | 140 | 90 | 50 | 26 | 19 | 82 | 847 |
| Turn Improperly | 2 | 103 | 71 | 87 | 108 | 67 | 57 | 45 | 42 | 52 | 634 |
| Exceed Speed Limit | 7 | 38 | 29 | 20 | 6 | 6 | 4 | 1 | 2 | 9 | 122 |
| Drive Too Fast | 9 | 229 | 140 | 159 | 122 | 88 | 47 | 16 | 14 | 51 | 875 |
| Unsafe Speed | 1 | 34 | 19 | 19 | 11 | 11 | 3 | 1 | 1 | 6 | 106 |
| Passing Improperly | 0 | 15 | 11 | 18 | 10 | 14 | 8 | 7 | 5 | 10 | 98 |
| Change Lanes Improperly | 0 | 46 | 34 | 37 | 38 | 32 | 18 | 16 | 20 | 31 | 272 |
| Fail to Yield | 1 | 191 | 128 | 193 | 209 | 179 | 109 | 99 | 112 | 117 | 1,338 |
| Disobey Traffic Control | 0 | 76 | 76 | 103 | 85 | 75 | 50 | 49 | 29 | 36 | 579 |
| Drive Wrong Way | 0 | 3 | 2 | 6 | 5 | 1 | 4 | 2 | 2 | 3 | 28 |
| Pass at Pedestrian Corridor | 0 | 3 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 6 |
| Backing Up Unsafely | 4 | 114 | 71 | 96 | 91 | 96 | 49 | 37 | 18 | 41 | 617 |
| Park Improperly | 1 | 7 | 4 | 4 | 13 | 10 | 2 | 9 | 10 | 3 | 63 |
| Careless Driving | 6 | 73 | 62 | 70 | 51 | 47 | 13 | 10 | 12 | 43 | 387 |
| Lost Control/Off Roadway | 11 | 150 | 86 | 104 | 79 | 53 | 34 | 16 | 15 | 7 | 555 |
| Driverless Vehicle | 0 | 1 | 1 | 1 | 2 | 3 | 3 | 0 | 0 | 0 | 11 |
| Leave Stop Sign | 0 | 52 | 22 | 40 | 37 | 30 | 20 | 34 | 40 | 14 | 289 |
| Fail to Signal | 0 | 2 | 4 | 3 | 4 | 6 | 0 | 0 | 0 | 1 | 20 |
| Take Avoiding Action | 0 | 38 | 32 | 38 | 34 | 30 | 13 | 12 | 7 | 2 | 206 |
| Driver Inexperience | 18 | 210 | 38 | 24 | 14 | 11 | 3 | 1 | 3 | 9 | 331 |
| Pedestrian Error/Confusion | 1 | 4 | 2 | 2 | 3 | 0 | 1 | 2 | 0 | 0 | 15 |
| Total | 101 | 5,325 | 4,991 | 7,589 | 8,061 | 6,052 | 3,363 | 2,063 | 1,322 | 5,844 | 44,711 |
| At-fault rate/1,000 active licenced drivers | -- | 35.8 | 17.8 | 9.7 | 6.9 | 6.6 | 6.1 | 6.6 | 10.1 | -- | 11.0 |

I. These statistics are understated and represent only those collisions where alcohol involvement was apparent.
Source: Manitoba Transportation and Government Services. *Traffic Collision Statistics Report 1999*, page 85.

Name: _____

QUESTIONS:**Preliminary activity: Getting to know the chart's data**

On the chart, notice the last two rows.

1. Consider the numbers in the row titled "Total".

a. What are the numbers about?

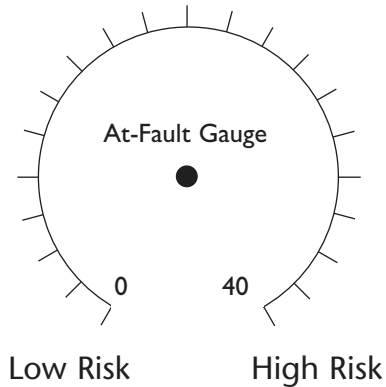
b. What age groups have the highest totals?

c. How does the Total for the Age Group 16-19 compare to the other age groups?

d. In one way, it is unfair to compare the Total for an Age Group such as 16-19 with an Age Group such as 25-34, just because of the *range* in the groups. State the range for each of the age groups in the charts. (Range will be the number of years that the group *spans*.) Explain the unfairness of comparing different-sized age groups.

Name: _____

2. At-Fault Gauge



Locate and mark 10, 20 and 30 around the At-Fault Gauge.

Using the figures in the "At-fault rate/1,000 active licenced drivers" row, locate the number on the At-Fault Gauge for the following age groups:

- a) 16-19 years b) 20-24 years c) 25-34 years
 d) 35-44 years e) 75> years

Follow this procedure for each age group:

- i) Use a paper clip as the "needle" for your gauge. Straighten out one end of the paper clip. Insert this end through the dot in the centre of the gauge. Lay the "needle" flat on the gauge.
- ii) Use your finger to move the needle on the At-Fault Gauge
- iii) Point the needle at the correct value for the specific age group.
- iv) Now mark and label the needle location for the specific age group.

Make a statement that relates the At-fault rate numerical value to the degree of risk.

3. The chart doesn't give the numbers of drivers in each age-range. However, they must have used those figures to calculate the at-fault rate in the final row. Calculate the numbers of drivers in each column (approximately). The first one is done for you.

- a) Age 16-19

$$\text{rate} = \frac{\text{total}}{\text{number of drivers}} \qquad 35.8 = \frac{5,325}{d}$$

(How do we solve for d? Try an easier question: Suppose it said $6 = 24 / d$. How would we find d? We would do $24/6$.)

$$5,325 / 35.8 = d \qquad d = 148.7$$

$$148 \times 1,000 = 148,700 \text{ drivers in that category}$$

Name: _____

b) Age 20-24:

c) Age 25-34:

d) Age 35-44:

4. Below are three different ways to revise the column structures so that the figures under each age group can be compared more fairly. Select your preference and defend it.
- a. Divide all the columns into 5-year intervals to match 20-24.
 - b. Combine two columns (16-19 and 20-24) into one, ages 16-24, to almost match all the others.
 - c. Divide each figure in the column by the number of years that the column spans.
 - d. Always work with rates such as traffic collisions per 1,000 drivers.

Name: _____

Finding and interpreting correlation coefficients

5. There are three rows of data that show traffic collisions involving speed-related driver action. At a glance it appears that younger drivers have more speed-related traffic collisions than older drivers. You are going to use the correlation coefficient r to answer this question: How strong is that relationship between age and speed-related traffic collisions? Refer to Activity 2 Worksheet A2: *Keystroke sequence using a TI-83* for this purpose.
6. Interpret the role of age and speed-related traffic collisions. Make a generalization. Make a statement supporting your generalization by referring to the data. Make a statement supporting your generalization by referring to the correlation coefficient.

Applying correlation coefficients and their interpretations

7. Should young people pay more for traffic collision insurance? If they do, at what age should people stop paying higher insurance premiums?
8. [Optional] Find out some *information* about graduated licensing restrictions on young drivers. Start at the Government of Manitoba website, or the Manitoba Public Insurance website. Take a personal position on the restrictions, and relate the information on speed-related traffic collisions to your position. Use the back of this worksheet.

Name: _____

Keystroke sequence using a TI-83

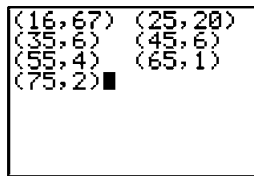
Steps for arriving at a Correlation Coefficient for Speed-Related Traffic Collisions on a TI-83

Refer to the table on page S2-37. This activity uses only the row for “Exceed Speed Limit”. You may wish to explore the other two rows for speed related collisions.

NOTE: All calculator keystrokes and commands are in bold font. The keys, which are above the actual calculator keys, are in square brackets.

STEP 1. Making ordered-pair data in your notebook.

- Add together the 16-19 and the 20-24 columns so that the age ranges in every column are somewhat comparable.
- Decide on a single age to represent each range of ages.
Choose the minimum age, the middle age or the maximum age.
Example: use **16** to represent the 16-24 age category.
- For each age, match the number of collisions from the chart.
You should have 7 ordered pairs of values, each following the form: (age, number of collisions) (fig 1). (Ignore 15-year-old drivers.)

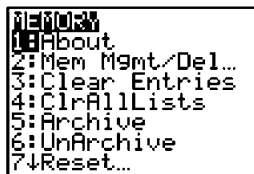


```
(16,67) (25,20)
(35,6)  (45,6)
(55,4)  (65,1)
(75,2) ■
```

fig 1

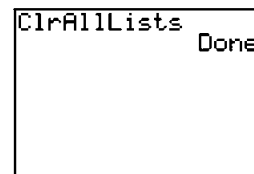
STEP 2. Entering the data into your calculator.

- Clear all data from the lists on your TI-83. Press **2nd [MEM]** and arrow down to select **4: ClrAllLists** (fig 2). When you press **ENTER**, **Done** should appear on the home screen (fig 3).



```
MEM
1:About
2:Mem Mgmt/Del...
3:Clear Entries
4:ClrAllLists
5:Archive
6:UnArchive
7↓Reset...
```

fig 2



```
ClrAllLists Done
```

fig 3

Name: _____

b) Get ready to enter data.

Press **STAT** and select **1: Edit** by pressing **ENTER** (fig 4).

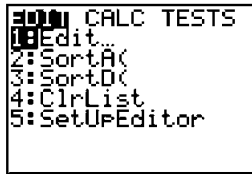


fig 4

c) Enter the age data.

In column L1 enter each age that you chose in step 1b above, pressing **ENTER** or the **DOWN** arrow between entries (fig 5).

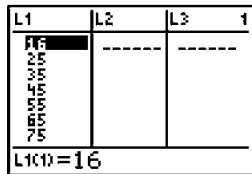


fig 5

d) Enter the data for the number of collisions for Exceed Speed Limit.

Use the right arrow to get to L2 and enter the data from the chart (fig 6).

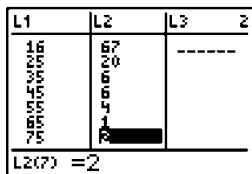


fig 6

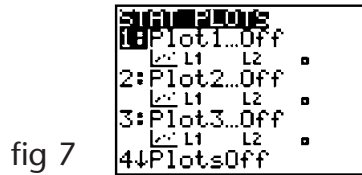
Name: _____

STEP 3. Display a graph of age compared to the number of collisions.

a) Turn on the Stats Plot function on your calculator.

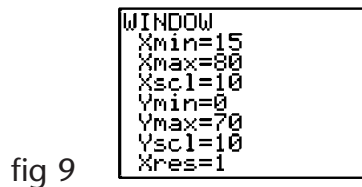
Press **2nd** [**STAT PLOT**] (fig 7).

Press **ENTER** to select **1: Plot1**. Turn **Plot1** to **ON** by pressing **ENTER**. Press **ENTER** to turn on the first scatter plot under **Type**. Enter **L1** in the **Xlist** and **L2** in the **Ylist** by pressing **2nd** and the **1** key for **L1** and **2nd** and the **2** key for **L2**. Choose a mark (fig 8).



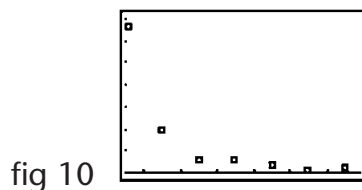
b) Select an appropriate window (domain and range).

Press **WINDOW** and enter the following values: **Xmin=15**, **Xmax=80**, **Xscl = 10**, **Ymin=0**, **Ymax=70**, **Yscl = 10** (fig 9).



c) View the graph.

Pressing **GRAPH** (fig 10).

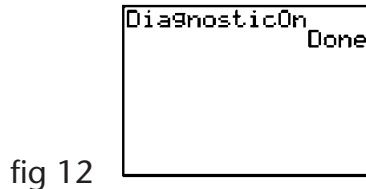


Name: _____

STEP 4. Building a line of best fit to find r .

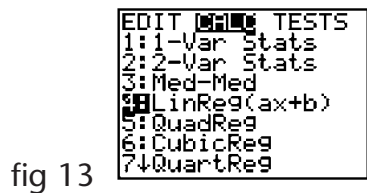
a) Activate the correlation coefficient:

Press **2nd** [CATALOG], followed by the **D** key. Scroll down with the down arrow to **DiagnosticOn** (fig 11) and press **ENTER**. Press **ENTER** again and **Done** will appear on the home screen (fig 12).



b) Find a linear regression.

First clear the home screen by pressing **2nd** [QUIT] and **CLEAR**. Then press **STAT**, arrow right to **CALC** and select **4:LinReg(ax+b)** (fig 13).



Name: _____

c) Tell it to compare L1 and L2 and call the answer Y1.

After the **LinReg(ax+b)** command appears on the home screen, press each of the following keys: **2nd [L1]**, **2nd [L2]** (fig 14).

Press **VARS** and arrow right to **Y-VARS** (fig 15). Select **1:Function** (fig 16) and then select **1:Y1** (fig 17).

fig 14

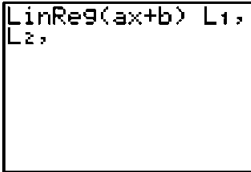


fig 15

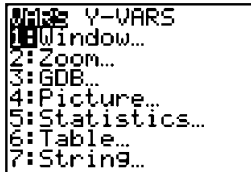


fig 16

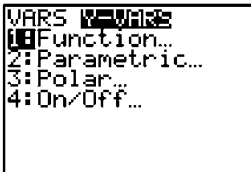
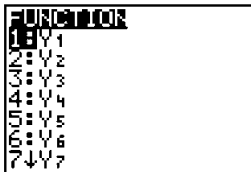


fig 17

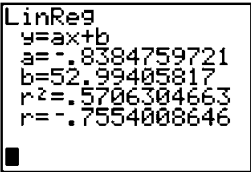


d) Execute the function by pressing **ENTER**.

You should see four values, including the r-value that we want (fig 18).

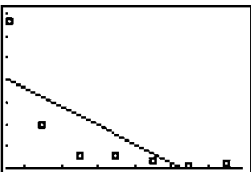
The strong negative number, a number closer to -1 than to -0.4, is a powerful correlation between increasing age and decreasing collision numbers.

fig 18



e) Press **GRAPH** to see your Regression Line (fig 19). Notice the negative slope of the line matches the negative r-value.

fig 19



Name: _____

Speed, traffic collisions and driver age – Answer key

Instructions: Complete the worksheet using a TI-83 graphing calculator.

Driver Involvement in Injury and Property Damage Traffic Collisions by Driver Action and Age Group 1999

| DRIVER ACTION | AGE GROUP | | | | | | | | | | TOTAL |
|---|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| | <16 | 16-19 | 20-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75> | NS | |
| Drive Properly | 39 | 3,778 | 4,012 | 6,430 | 6,999 | 5,202 | 2,874 | 1,680 | 971 | 5,327 | 37,312 |
| Follow Too Closely | 1 | 158 | 146 | 135 | 140 | 90 | 50 | 26 | 19 | 82 | 847 |
| Turn Improperly | 2 | 103 | 71 | 87 | 108 | 67 | 57 | 45 | 42 | 52 | 634 |
| Exceed Speed Limit | 7 | 38 | 29 | 20 | 6 | 6 | 4 | 1 | 2 | 9 | 122 |
| Drive Too Fast | 9 | 229 | 140 | 159 | 122 | 88 | 47 | 16 | 14 | 51 | 875 |
| Unsafe Speed | 1 | 34 | 19 | 19 | 11 | 11 | 3 | 1 | 1 | 6 | 106 |
| Passing Improperly | 0 | 15 | 11 | 18 | 10 | 14 | 8 | 7 | 5 | 10 | 98 |
| Change Lanes Improperly | 0 | 46 | 34 | 37 | 38 | 32 | 18 | 16 | 20 | 31 | 272 |
| Fail to Yield | 1 | 191 | 128 | 193 | 209 | 179 | 109 | 99 | 112 | 117 | 1,338 |
| Disobey Traffic Control | 0 | 76 | 76 | 103 | 85 | 75 | 50 | 49 | 29 | 36 | 579 |
| Drive Wrong Way | 0 | 3 | 2 | 6 | 5 | 1 | 4 | 2 | 2 | 3 | 28 |
| Pass at Pedestrian Corridor | 0 | 3 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 6 |
| Backing Up Unsafely | 4 | 114 | 71 | 96 | 91 | 96 | 49 | 37 | 18 | 41 | 617 |
| Park Improperly | 1 | 7 | 4 | 4 | 13 | 10 | 2 | 9 | 10 | 3 | 63 |
| Careless Driving | 6 | 73 | 62 | 70 | 51 | 47 | 13 | 10 | 12 | 43 | 387 |
| Lost Control/Off Roadway | 11 | 150 | 86 | 104 | 79 | 53 | 34 | 16 | 15 | 7 | 555 |
| Driverless Vehicle | 0 | 1 | 1 | 1 | 2 | 3 | 3 | 0 | 0 | 0 | 11 |
| Leave Stop Sign | 0 | 52 | 22 | 40 | 37 | 30 | 20 | 34 | 40 | 14 | 289 |
| Fail to Signal | 0 | 2 | 4 | 3 | 4 | 6 | 0 | 0 | 0 | 1 | 20 |
| Take Avoiding Action | 0 | 38 | 32 | 38 | 34 | 30 | 13 | 12 | 7 | 2 | 206 |
| Driver Inexperience | 18 | 210 | 38 | 24 | 14 | 11 | 3 | 1 | 3 | 9 | 331 |
| Pedestrian Error/Confusion | 1 | 4 | 2 | 2 | 3 | 0 | 1 | 2 | 0 | 0 | 15 |
| Total | 101 | 5,325 | 4,991 | 7,589 | 8,061 | 6,052 | 3,363 | 2,063 | 1,322 | 5,844 | 44,711 |
| At-fault rate/1,000 active licenced drivers | -. | 35.8 | 17.8 | 9.7 | 6.9 | 6.6 | 6.1 | 6.6 | 10.1 | -. | 11.0 |

1. These statistics are understated and represent only those collisions where alcohol involvement was apparent.
Source: Manitoba Transportation and Government Services. *Traffic Collision Statistics Report 1999*, page 85.

Name: _____

QUESTIONS:**Preliminary activity: Getting to know the chart's data**

On the chart, notice the last two rows.

1. Consider the numbers in the row titled "Total".

a. What are the numbers about?

The "Total" row shows the numbers of traffic collisions in 1999 for each age group.

b. What age groups have the highest totals?

The At-fault rate shows the results of dividing the total number of traffic collisions for each age group by the number of active drivers in that age group. Then that number was multiplied by 1,000 to give the number of traffic collisions per 1,000 drivers. The age group 25-34 yrs has the highest total; then the age group 35-44 yrs.

c. How does the Total for the Age Group 16-19 compare to the other age groups?

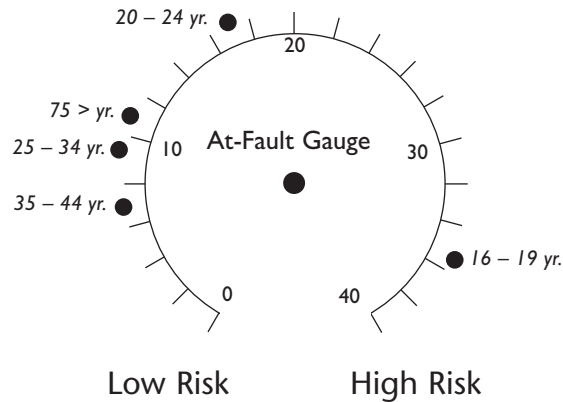
(Answers will vary.) It's pretty high, slightly higher than for ages 20-24, but not as high as the next three age groups.

d. In one way, it is unfair to compare the Total for an Age Group such as 16-19 with an Age Group such as 25-34, just because of the *range* in the groups. State the range for each of the age groups in the charts. (Range will be the number of years that the group *spans*.) Explain the unfairness of comparing different-sized age groups.

There are 4 years spanned in the group of drivers aged 16-19, and 5 years spanned in the group of drivers aged 20-24, and 10 years spanned in the other groups. To compare just raw numbers from groups with different ranges is unfair, since groups with greater ranges will likely have bigger numbers.

Name: _____

2. At-Fault Gauge



Locate and mark 10, 20 and 30 around the At-Fault Gauge.

Using the figures in the "At-fault rate/1,000 active licenced drivers" row, locate the number on the At-Fault Gauge for the following age groups:

- a) 16-19 years b) 20-24 years c) 25-34 years
 d) 35-44 years e) 75> years

Follow this procedure for each age group:

- i) Use a paper clip as the "needle" for your gauge. Straighten out one end of the paper clip. Insert this end through the dot in the centre of the gauge. Lay the "needle" flat on the gauge.
- ii) Use your finger to move the needle on the At-Fault Gauge
- iii) Point the needle at the correct value for the specific age group.
- iv) Now mark and label the needle location for the specific age group.

Make a statement that relates the At-fault rate numerical value to the degree of risk.

The lower the at-fault numerical value, the lower the risk of traffic collisions.

The higher the at-fault numerical value, the higher the risk of traffic collisions.

3. The chart doesn't give the numbers of drivers in each age-range. However, they must have used those figures to calculate the at-fault rate in the final row. Calculate the numbers of drivers in each column (approximately). The first one is done for you.

a) Age 16-19

$$\text{rate} = \frac{\text{total}}{\text{number of drivers}} \qquad 35.8 = \frac{5,325}{d}$$

$$5,325 / 35.8 = d \qquad d = 148.7$$

$$148 \times 1,000 = 148,700 \text{ drivers in that category}$$

Name: _____

b) Age 20-24:

$$\text{rate} = \frac{\text{total}}{\text{number of drivers}} \quad 17.8 = \frac{4,991}{d}$$

$$4,991 / 17.8 = d \quad d = 280.4$$

$$280.4 \times 1,000 = 280,400 \text{ drivers in that category}$$

c) Age 25-34:

$$7,589 / 9.7 \times 1,000 = 782,400$$

d) Age 35-44:

$$8,061 / 6.9 \times 1,000 = 1,168,000$$

4. Below are three different ways to revise the column structures so that the figures under each age group can be compared more fairly. Select your preference and defend it.
- Divide all the columns into 5-year intervals to match 20-24.
 - Combine two columns (16-19 and 20-24) into one, ages 16-24, to almost match all the others.
 - Divide each figure in the column by the number of years that the column spans.
 - Always work with rates such as traffic collisions per 1,000 drivers.

(Answers may vary.)

Choice A would give lots of columns, and we could keep a distinction between the very young (16-19 yrs) and the young (20-24 yrs). It might not be fair to just divide the totals for the other columns by 2 to share between the two age groups, and it would be a lot of work to recount the data.

Choice B gives us fewer columns, and it's pretty easy to do. People might be really interested in differences between teen drivers and drivers in their early 20s though.

Choice C balances all data by the same rule. However, it's not really the number of age-years that are covered by a number, since some years will have fewer drivers.

Choice D balances all data by the same rule. However, it would be a lot of arithmetic to divide every number by the numbers of drivers. Even then, some drivers don't drive much, while others drive lots, so it still wouldn't account for all variations.

Name: _____

Finding and interpreting correlation coefficients

5. There are three rows of data that show traffic collisions involving speed-related driver action. At a glance it appears that younger drivers have more speed-related traffic collisions than older drivers. You are going to use the correlation coefficient r to answer this question: How strong is that relationship between age and speed-related traffic collisions? Refer to Activity 2 Worksheet A2: *Keystroke sequence using a TI-83* for this purpose.

Any correlation coefficient between -0.4 and $+0.4$ isn't very strong. Any correlation coefficient closer to 1.0 than 0.5 is very strong. Any correlation coefficient closer to -1 than -0.5 is very strong (inverse).

Step 1. Making ordered-pair data.

Data for a combined column, ages 16-24:

Excess speed: $38 + 29 = 67$

Drive too fast: $229 + 140 = 369$

Unsafe speed: $34 + 19 = 53$

Choosing a single age for each age group: (Answers may vary.)

If choosing a minimum age: 16, 25, 35, 45, 55, 65, 75

If choosing a middle age: 20, 29 or 30, 39 or 40, 49 or 50, 59 or 60, 69 or 70, 79 or 80

If choosing a maximum age: 24, 34, 44, 54, 64, 74, 84

Ordered pairs could be shown in a chart or in a list: this list used a middle age for each group. (age, number of traffic collisions) = (20, 67), (30, 20), (40, 6), (50, 6), ...

Step 2. Entering the data into your calculator.

Column L1 should have the ages in a list downward: 20, 30, 40, 50 ...

Column L2 should have the number of traffic collisions: 67, 20, 6, 6 ...

Step 3. Display a graph of age compared to number of traffic collisions.

The graph will show dots that are near the top of the screen on the left edge, diminishing as the eye moves across the screen to the right, until they're near the bottom axis near the right edge of the screen.

Step 4. Building a line of best fit to find r .

The r value will depend on the numbers chosen for the age (in other words, for the L1 column). Regardless, the value will still be a strong negative amount: closer to -1.0 than -0.4 , and it will still suggest a strong negative correlation: as age increases, traffic collisions with excess speed as a factor diminishes.

Name: _____

6. Interpret the role of age and speed-related traffic collisions. Make a generalization. Make a statement supporting your generalization by referring to the data. Make a statement supporting your generalization by referring to the correlation coefficient.

(Answers will vary.) Appropriately cautious generalizations will avoid saying that one of the factors causes or determines the other one: the correlation coefficient says only how strongly they are related, not the kind of relationship. However, the strength of this relationship would justify strong statements of relationship between age and speed as factors in traffic collisions. Students deserve help in avoiding the error of switching ideas, such as equating age with driving experience, or switching from numbers of traffic collisions involving speed to driving carelessly or driving with poor judgment: technically, the data doesn't report years of driving experience, and the only contributing factor reported in this data analysis is speed.

Applying correlation coefficients and their interpretations

7. Should young people pay more for traffic collision insurance? If they do, at what age should people stop paying higher insurance premiums?

(Answers will vary.)

- **Arguments for:** insurance is a mechanism for spreading out risks across others, so maybe the risks (and thus the premiums) should be differentially evaluated within specific groups.
 - **Arguments against:** it may be illegal and/or immoral to assume that every member of an identifiable group will exhibit the behaviours or characteristics of other members of that group.
 - **Argument for:** unless people from high-risk groups do pay more, given the higher number of claims from those groups, people from low-risk groups will be paying for others' traffic collisions.
 - **Argument against:** often the people least able to afford expensive insurance are the young: can't the system give them a break, and then make it back from them when they're older?
8. [Optional] Find out some *information* about graduated licensing restrictions on young drivers. Start at the Government of Manitoba website, or the Manitoba Public Insurance website. Take a personal position on the restrictions, and relate the information on speed-related traffic collisions to your position. Use the back of this worksheet.

(Answers will vary.) High-quality answers will respond to accurate information about graduated licensing, and will apply the data from the table, and the statistics derived from the data, to support any position.

ACTIVITY 3 Motor Vehicles in Motion – Is driving fast economical? —

Prescribed Learning Outcomes:

Safety SLOs:

K.3.S2.A.5a Determine the safety considerations in selected alternative pursuits (e.g. driving fast, watching for weather conditions).

Complementary SLOs:

Activity Outcomes:

Students will be able to:

- Identify the negative risks/consequences of driving fast.
 - Identify the perceived potential benefits of driving fast.
 - Determine the actual benefits of driving fast.
 - Compare the actual benefits of driving fast to the perceived benefits.
 - Explain why driving fast is not economical.
-

Suggestions for Instruction:

NOTE:

- 1) Students need to know how to work with calculations of velocity, distance and time.
- 2) Prior to class, the teacher may select and determine the distance of a driving route that is well known to students. The route selected is preferably a relatively short one (10 km - 30 km), with a uniform speed limit throughout the majority of the route. Make note of the speed limit(s).

OR

The teacher may alternatively use one of the distances provided on Activity 3 Worksheet A: *Route distances*.

- 3) This learning activity may take 70 minutes.
 - 4) Activity 2 deals with driver actions and traffic collisions, in particular, speed-related traffic collisions by age group.
- Explain to students that this activity looks at the question: Is driving fast economical?
 - Brainstorm as a class the potential dangers/negative consequences of driving fast.
(Possible answers:
 - a) increased chance of traffic collision - examples:
 - i) The risk of death and severe injury is a direct exponential function of speed, not speed differences. (Source: Insurance Institute for Highway Safety website - www.hwysafety.org/safety_facts/qanda/speed_limits.htm)
 - ii) Exceeding the speed limit accounted for almost 25% of the primary at-fault driver actions in the 16-19 year age group. (Source: MPI. *Traffic Collision Statistics Report 1999*.)

- b) greater chance of injury, disability or death in case of a collision
Example: Thirteen Manitobans are killed and 442 injured each year due to speeding.
(Source: MPI. *Traffic Collision Statistics Report 1999*.)
 - c) greater chance of property damage
 - d) possible fines and demerits (e.g. drivers must pay additional premiums when they accumulate traffic convictions. Drivers receive demerits for traffic convictions such as speeding. Drivers with 6 or more demerit points on their driver's licences pay an extra charge beginning at \$200.00 for 6 demerit points. The financial penalties increase depending on the number of demerits. (Source: MPI. *Guide to Autopac 2002*.)
 - e) increased fuel consumption
 - f) greater wear and tear on the motor vehicle)
- Brainstorm as a class the potential benefits of driving fast.
(Possible answers: less time to arrive at destination; exciting...)
 - Discuss and compare, as a class, the dangers versus the benefits of driving fast.
 - Ask the class to indicate with a show of hands "Is driving fast economical?"
 - Explain to students that many people continue to choose to drive fast because they see the guarantee of time saved worth taking the chance that nothing bad will happen. Consequences like risk of injury, disability or death, and fuel consumption and wear and tear on the vehicle are often not taken into account.
 - Ask students "How much time does driving fast actually save?"
 - Introduce Activity 3 Worksheet A: *Route distances*.
 - Select a route distance from Worksheet A: *Route distances*.
 - Introduce the Activity 3 Worksheet B1: *Time saved by driving fast*.
 - Explain to students that they will use the worksheet to calculate the time saved by driving fast on the selected route.
 - Demonstrate how to complete Worksheet B1: *Time saved by driving fast*.
 - Have students work individually or divide into pairs.
 - Ask students to select a route from Worksheet A OR provide students with the distance for the route and its speed limit.
 - Have students record the anticipated time saved by driving fast.
 - Have students complete Worksheet B1.
 - Discuss how the calculated time saved compared to what students expected the time saving to be.
NOTE: Reinforce that the actual time saved is much lower than expected.
 - Review the list of consequences of driving too fast:
(Possible answers: Although driving fast over long distances such as from Winnipeg to Calgary may save some time, the possible consequences are: traffic collisions, injury or death, property damage, financial penalties, demerits or loss of licence, and the fact that drivers still have to obey other traffic signs such as stop signs, traffic lights, yield signs.)
 - Ask students again "Is driving fast economical?"
 - Have students search the Internet to examine risks such as injury, disability and death due to driving too fast for conditions, penalties/fines/demerits for driving too fast, the fuel consumption of a motor vehicle travelling at different speeds.
 - Have students view and discuss the video "*The Laws of Physics*", 23 minutes, which is a computer-generated look at friction, gravity and inertia as they relate to driving.
(Available from Manitoba Public Insurance.)
 - Optional follow-up: Debate the topic "Is driving fast worth the risks?"

Suggestions for Assessment:

- Have students choose a different route and calculate the time saved using the same procedures.
NOTE: Students who ride the bus to school may ask the bus driver for odometer readings to determine the distance they commute to and from school.
 - Correct the worksheet as a class. See Activity 3 Worksheet B2: *Time saved by driving fast - Example*.
 - Use the Teacher Road Safety Checklist to assess the students' understanding of the actual benefits of driving fast compared to the perceived benefits. (See Assessment Tool.)
 - Complete a teacher-generated written quiz.
 - Design an anti-speeding poster.
-

Cross-Curricular Connections:

- Science (in motion)
 - English Language Arts (manage ideas and information; explore thoughts, ideas, feelings and experiences; comprehend and respond personally and critically to oral, literary and media text)
 - Physical Education/Health Education (personal and social management; healthy lifestyle practices)
-

Opportunities for Family/Community Involvement:

- Invite students and their families to select a common route they travel, record the distance and complete Worksheet B1: *Time saved by driving fast*.
- Invite the local police, RCMP, Band constable or ambulance attendant to discuss their experiences with people driving too fast for conditions and speed as a factor in traffic collisions.
- Have students share their experiences in a close call when driving fast.

Route distances

Here are the distances of some driving routes. Speed limits are not provided as in many cases the speed limits are not constant throughout the entire route. It is suggested that you make the simplification of using a single speed limit for the entire route. It is important to point out that the calculated times will be approximate, but will be sufficient for the intended use. Alternatively, obtain data (yourself or as a student exercise) to use in this exercise. In all cases, note that the times calculated are driving times, and do not include time that may be spent waiting at traffic lights, etc.

| Routes – Within Winnipeg | | Distance (km) | Routes – Outside Winnipeg | | Distance (km) |
|---|--|----------------------|--|--|----------------------|
| Springfield Rd, from Henderson Hwy to Hwy 59 | | 3.5 | Main St, from North Perimeter to Selkirk | | 23 |
| Henderson Hwy, from Springfield Rd to Disraeli Fwy | | 4.4 | Hwy 44, from Hwy 59 to Tyndall | | 15.9 |
| Hwy 59, from North Perimeter to Nairn/Regent | | 6.6 | Hwy 75, from South Perimeter to Hwy 305 (Ritchot) | | 24.7 |
| Hwy 59, from South Perimeter to Nairn/Regent | | 10 | Hwy 3/14, from Hwy 432 (Morden) to Hwy 428 (Winkler) | | 13.2 |
| Regent Ave W, from Hwy 59 to Day St | | 4.7 | Portage la Prairie: Saskatchewan Ave/West/East, from | | 3.3 |
| Main St, from North Perimeter to Jefferson Ave | | 5.5 | 21st St NW to 14th St NE | | 5 |
| Main St, from Jefferson Ave to Portage Ave | | 4.6 | Brandon: Victoria Ave, from 34th St to 17th St East | | 3.8 |
| Main St/St. Mary's Rd, from Portage Ave to Fermor Ave | | 5.5 | Steinbach: Main St from Brandt St to Hershfeld Rd | | 16.9 |
| St. Mary's Rd, from Fermor Ave to South Perimeter | | 6.8 | Sanford to South Perimeter | | 52.9 |
| Marion St, from Tache Ave to Hwy 59 | | 3.7 | Morris to South Perimeter | | 44.6 |
| Bishop Grandin, from River Rd to Hwy 59 | | 6.8 | Morris to Emerson | | 3.1 |
| Waverley St, from Bison Dr to Wilkes Ave | | 5.1 | Flin Flon: Hwy 10A (whole length) | | 141 |
| Pembina Hwy, from Corydon Ave to McGillivray Blvd | | 3.8 | The Pas to Flin Flon | | 112.6 |
| Pembina Hwy, from McGillivray Blvd to South Perimeter | | 7.3 | Thompson to Wabowden | | 49.6 |
| Notre Dame Ave, from King St to Dublin Ave | | 3.8 | Cranberry Portage to Flin Flon | | 112.5 |
| McPhillips St, from Notre Dame Ave to Inkster Blvd | | 3.9 | Norway House to Cross Lake | | 304.6 |
| McPhillips St, from Inkster Blvd to North Perimeter | | 6.8 | Gillam to Thompson | | 79.2 |
| Portage Ave, from Main St to St. James St | | 4.9 | Ashern to Gypsumville | | |
| Portage Ave, from St. James St to West Perimeter | | 5 | | | |
| Corydon Ave, from Kenaston Blvd to Moray St | | 4.4 | | | |

Time saved by driving fast

Name: _____

Instructions: Complete the worksheet.

Part 1: Route Information

Description of route: _____

Distance of route in km: $d =$ _____ km Speed Limit for route in km/h: $v =$ _____ km/h

Part 2: Anticipated Time Saved

_____ Minutes

Part 3: Determining Time at Speed Limit

Using the above values for distance (d) and speed (v), determine the time (t) to drive the route at the speed limit using the equation $v = \frac{d}{t}$

Answer: $t =$ _____ hours

Convert the above answer from hours to minutes by multiplying it by 60.

Answer: $t =$ _____ minutes if driving at speed limit

Part 4: Determining Time if Driving Fast

Driving fast speed: $v =$ _____ km/h

Using the same value for distance (d), now use the driving fast speed (v) to determine the time (t) to drive the route while driving fast using the equation $v = \frac{d}{t}$

Answer: $t =$ _____ hours

Convert the above answer from hours to minutes by multiplying it by 60.

Answer: $t =$ _____ minutes if driving fast

Part 5: Determining Time Saved by Driving Fast

Complete the subtraction here to calculate how many minutes would be saved by driving fast on this route:

_____ minutes (at speed limit) - _____ minutes (if driving fast) = _____ minutes saved

Time saved by driving fast - Example

Instructions: Complete the worksheet.

Name: _____

Part 1: Route Information

Description of route: Portage Ave from Main St to St. James St

Distance of route in km: $d = \underline{4.9}$ km Speed Limit for route in km/h: $v = \underline{50}$ km/h

Part 2: Anticipated Time Saved

5 Minutes

Part 3: Determining Time at Speed Limit

Using the above values for distance (d) and speed (v), determine the time (t) to drive the route at the speed limit using the equation $v = \frac{d}{t}$

$$v = \frac{d}{t}$$

$$50 = \frac{4.9}{t}$$

$$50t = 4.9$$

$$t = \frac{4.9}{50}$$

$$t = 0.098$$

Answer: $t = \underline{0.098}$ hours

Convert the above answer from hours to minutes by multiplying it by 60.

Answer: $t = \underline{5.88}$ minutes if driving at speed limit

Part 4: Determining Time if Driving Fast

Driving fast speed: $v = \underline{\quad}$ km/h

Using the same value for distance (d), now use the driving fast speed (v) to determine the time (t) to drive the route while driving fast using the equation $v = \frac{d}{t}$

$$v = \frac{d}{t}$$

$$50 = \frac{4.9}{t}$$

$$50t = 4.9$$

$$t = \frac{4.9}{50}$$

$$t = 0.098$$

Answer: $t = \underline{0.0817}$ hours

Convert the above answer from hours to minutes by multiplying it by 60.

Answer: $t = \underline{4.9}$ minutes if driving fast

Part 5: Determining Time Saved by Driving Fast

Complete the subtraction here to calculate how many minutes would be saved by driving fast on this route:

5.88 minutes (at speed limit) - 4.9 minutes (if driving fast) = .98 minutes saved

ACTIVITY 4 People in Motion – Stop It!

Prescribed Learning Outcomes:

Safety SLOs:

K.3.S2.A.5a Determine the safety considerations in selected alternative pursuits (e.g. wear protective equipment, watch for weather conditions).

Complementary SLOs:

Activity Outcomes:

Students will be able to:

- Identify the main safety features of a motor vehicle.
 - Compare a traffic collision involving an unrestrained passenger moving at a given speed with a fall from a corresponding height.
 - Package an egg so that it will “survive” a 6-metre fall.
 - Use the terms momentum, impulse and force to explain the benefits of seat belts and air bags, and why students’ egg package design worked.
-

Suggestions for Instruction:

NOTE:

- 1) Students need to be familiar with Newton’s Laws and have a qualitative understanding of inertia, momentum, impulse and force. See the Glossary at the end of the unit.
 - 2) Teachers may refer to Activity 4: *Teacher background notes on physics* for an explanation of Newton’s Laws.
 - 3) The teacher must choose the specifications for the activity. See suggestions below.
 - 4) This learning activity may take 140 minutes.
- Describe to students the following real-life traffic collision that actually took place.
Traffic Collision: A farmer was driving an egg truck at approximately 55 km/h when the truck was involved in a serious collision. The truck came to a very abrupt stop. The farmer was not wearing a seat belt, and the truck was not equipped with air bags. The eggs were packed in cartons on crates, which were strapped to the back of the truck. The farmer was killed; more than 95% of the eggs the truck was carrying were undamaged.
 - Ask students: “Why did the most of the eggs survive the traffic collision while the farmer did not?”
 - Discuss as a class.

NOTE: Refer to Activity 4: *Teacher background notes on physics*. The teacher is to guide the discussion to include Newton’s Laws, inertia, momentum, impulse and force (e.g. all objects in motion tend to stay in motion - inertia/Newton’s first law). Before the collision, the farmer and the eggs had momentum, but not after they had come to a stop. An impulse (a force acting over a length of time) acted on the farmer and the eggs to change the momentum.

The farmer came to a very abrupt stop when he hit the steering wheel and windshield. The force needed to cause this abrupt stop was very large and killed him. The eggs, on the other hand, were restrained in their cartons, which enabled them to come to a more gradual stop. The force causing this stop was smaller and spread over a large portion of the eggs, allowing most of them to survive.

- Discuss the safety features available for the occupants of a motor vehicle (i.e. seat belts, air bags, reinforced passenger compartments, bumpers and crumple zones).
HINT: Begin by discussing safety features used by stunt people when they fall/jump from various heights (e.g. huge air bags).
- Discuss the need for these features.
NOTE: A common misconception is that people feel they will be able to prevent bodily injury in the event of a collision by “stopping themselves” with their arms out in front of them.
- Ask students: “Would you suffer bodily injury if you were dropped onto a hard floor from a height of 1 metre?”
NOTE: Anticipate the answer “no”, this is not a very high distance to fall.
- Ask students: “Would you suffer bodily injury if you were dropped onto a hard floor from a height of 1 metre, from a horizontal, face-down position?”
NOTE: Anticipate the answer “yes”, that fall would hurt.
- Introduce as an overhead the Activity 4 Visual: *Impact speed when dropped from approximate corresponding heights*.
- Discuss the meaning of this information.
Example: An unrestrained passenger moving at 60 km/h will hit the dashboard (etc.) in a way that can be compared to being dropped horizontally, face down from a height of 14.2 metres. A “storey” of a building can be estimated to be 3 metres, making this a fall of nearly 5 storeys. Ask students if landing from this fall with your arms out would be sufficient to stop you safely. The answer is “no”.
- Introduce Activity 4 Worksheet A1: *Protecting a passenger*.
- Provide students with the package specifications selected.
Possible package specifications:
 - 1) maximum package size: no larger than 20 cm of width, length or height;
 - 2) materials used: restricted to contain no synthetic materials such as Styrofoam, rubber, plastic, sponge;
 - 3) egg must be at least partially visible when packaged;
 - 4) egg must be removed from dropped package within a time limit (e.g. suggestion of 30 seconds).
- Have students work either individually or in pairs.
- Instruct students to complete the worksheet as they design, construct and test a package in which a raw egg will be placed.
- Explain that the packaged egg will then be dropped from a teacher-chosen height (e.g. suggested height equal to 6 metres).
- Once all students have conducted the egg drop, ask students to explain why their egg package design did or did not work using the terms momentum, impulse and force.

- Discuss the following 2 questions as a class:
 - 1) Is there a limit to the height at which an egg can be dropped and NOT be protected? (Sample answer: Arrive at the conclusions that at some point, no matter how protected an egg (person) is, it (person) will break (be killed).
 - 2) Suppose that a completely “indestructible” car could be produced. From a safety point of view, would it be wise to drive this car?
(Sample answer: Although the car itself would survive any collision, the occupants of this car would be much more likely to receive serious injuries. Recall that the crumple zones of a car help to slow the car down more gradually (e.g. greater time to stop = smaller force in stopping). The indestructible car has no allowance to crumple, and so would stop very abruptly; very-large forces would accompany the very-short stop time. For these reasons, cars are in fact designed to be very destructible – after all, the car is easily replaced, passengers are NOT so easily replaced.
- Optional follow-up: Have students repeat the activity as described above with the following 2 changes:
 - 1) Substitute a single “Pringles” brand potato chip for the egg, and
 - 2) Instead of the package being dropped, the package must be sent through regular Canada Post mail to a recipient (e.g. the school’s or a teacher’s home address is suggested).

NOTE:

 - 1) The potato chip must be completely unaltered (e.g. the unique shape must be preserved) and the chip must arrive without being broken.

The package dimensions should be restricted to a smaller size – suggested size no larger than 12 cm by 12 cm by 8 cm.
 - 2) This follow-up activity may be considered as a bonus assignment, or a required assignment for students with unsuccessful egg packages.
- Have students view and discuss the video “*Understanding Car Crashes*”, 22 minutes, which discusses vehicles and occupants in car crashes, and relates classroom physics to real-life situations. (Available from Manitoba Public Insurance.)

Suggestions for Assessment:

- Ask students to name the safety features of a motor vehicle.
- Correct Worksheet A1 as a class. See Activity 4 Worksheet A2: *Protecting a passenger – Example*.
- Use the students’ completed Worksheet A1 for assessment purposes.
- Have students prepare and give short presentations on their package designs, describing the science of why their packages were or were not successful.
- Use the Teacher Road Safety Checklist to assess the students’ understanding of momentum, impulse and force to explain the benefits of seat belts and air bags and why the egg packages worked.

Cross-Curricular Connections:

- Science (in motion)
 - English Language Arts (manage ideas and information; explore thoughts, ideas, feelings and experiences; comprehend and respond personally and critically to oral, literary and media text; celebrate and build community)
-

Opportunities for Family/Community Involvement:

- Invite students in other classes, families and members of the community to observe or officiate at the drop testing.

Teacher background notes on physics

A striking behaviour of matter is that if left to itself, any object will maintain its present motion: this property is named **inertia**. Specifically, if not moving, it will require an effort (a **force**) to get it moving. If already moving, it will again require an effort (a force) to speed it up, slow it down, or even to change its direction of travel. This basic behaviour is the essence of **Newton's 1st Law**, which can be stated as "any object will have constant velocity (which may include zero velocity) *unless* there is a net force acting on it. The "net" in this statement refers to the fact that multiple forces can add up in interesting ways: forces that act in opposite directions can "add up" to zero – which is commonly described as "cancelling". Newton's 1st Law is useful as it links constant velocity to a net force of zero: having one implies the other, and not having one implies that you do not have the other.

As an example, consider a car moving steadily at 60 km/h. This car clearly has a constant velocity, so by Newton's 1st Law, there must be no net force. Since there are forces present, they must all be cancelling (adding up to zero). Note that a common mistake is to believe that with a forward motion, there must be a net forward force. Forces are not needed to maintain motion, only to change motion. Considering only horizontal forces, there are two in this example: the force of air resistance in the backward direction, and the "driving" force. The air resistance attempts to slow the car down, while the driving force tries to speed the car up. The car is not speeding up, nor is it slowing down. This is because the two forces are the same size and so they add to give a net force of zero. Note that although these forces are equal and opposite, they in no way represent Newton's 3rd Law (see next page). If the driving force becomes a little smaller (by easing off the accelerator), the force of air resistance will then be in the lead, and so the car will accelerate backwards (it will slow down). If instead, the driving force increases a little (by providing more fuel via the accelerator), the driving force will exceed the force of air resistance, and the car will speed up. Notice that in all of these situations, the driving force is forward, while the air resistance is backwards.

Newton's 2nd Law extends the above, by mathematically linking the amount of acceleration with the amount of net force on a given mass. It is commonly written as $F_{\text{net}} = ma$. This is a straightforward equation, but one must know that " F_{net} " (the net force) is really the total force acting on an object, as described above. An alternative symbol for net force is F , where the symbol " Σ " is the Greek letter "sigma", which is the mathematical symbol for "total" or "sum". The unit of force is also defined from this equation: one Newton is the force that produces an acceleration of 1 m/s^2 on a mass of 1 kg. It may be helpful to know that a Newton of force is roughly 1/5 of a pound of force, and approximately the weight of 100 grams.

Newton's 3rd Law is typically the least well understood of Newton's Laws. It is commonly stated as "for every action there is an equal and opposite reaction" which is not wrong, but easily misinterpreted. Newton's 3rd Law is clearer in terms of forces: every force is an interaction of two objects, which mutually exert forces on each other. These two objects push or pull each other with forces of equal size, but opposite in direction, all of the time. As an example, consider a truck driven into a parked car. On impact, the truck pushes the car forwards (an "action"). This makes the car accelerate forwards, and also likely causes damage to the car. Simultaneously, the car exerted a force on the truck in the opposite direction. This would slow the truck down, and also likely cause damage to it as well. Notice that had the truck been moving at a different speed prior to impact, these forces would change in size, but would always be the same size as each other – it would therefore be impossible for the truck to exert a large force on the parked car without having a large force acting back on itself from the car.

Momentum is another measure of the motion of an object. Momentum is the product of an object's mass and its velocity. (The symbol "p" is commonly used for momentum, so $p = mv$). Momentum may be thought of as being rather like velocity in that an object at rest has zero momentum, and the faster it goes, the more momentum it has. The difference between momentum and velocity is that momentum also takes the object's mass into account, so that two objects moving with the same velocity need not have the same momentum – if one of the objects has more mass, then it will have more momentum. A 1,000 kg car moving at 1 m/s and a 1 kg brick moving at 1,000 m/s would have the same amount of momentum.

An object that is accelerating has a changing velocity. Typically, the mass of an object may be considered constant, so an accelerating object would therefore have a changing momentum. Just as (net) force is responsible for causing acceleration, it can also be given the credit (for now) for changing the momentum of an object. Large net forces change momentum rapidly, small net forces change momentum slowly, and zero net force implies an unchanging momentum. In fact, the same net force would change the momentum of any object – regardless of mass – at the same rate. This means that a particular net force applied for a particular amount of time will change the momentum of any object by the same amount (again, regardless of mass). This "force acting over time" is given its own name: **impulse**. Impulse is the combined effect of force and the length of time over which the force is applied. To produce a large impulse, one should "push hard" (a large force) and "keep pushing" (push for a long time). This large impulse will produce a large change in momentum to what it was applied (assuming no other forces were acting). Conversely, a small impulse (small force for a short time) will not be very effective at producing changes in momentum. This means that impulse (force acting over time), and not merely force, deserves the credit for changing the momentum of an object.

Impulse is a useful concept when comparing different ways to change motion. For example, suppose a car is moving quickly. The people in the car are moving just as fast as the car, and so have a rather large momentum ($p = mv$, where v is rather large). Suppose that something happens resulting in the car and people being brought to a stop. After they are stopped, the people will have no momentum, so clearly the act of stopping changed the momentum. In fact, no matter what happened, the amount of momentum change is fixed for any particular initial speed in coming to a stop. This means that the impulse responsible for bringing a person to a stop from a particular speed is fixed – no matter how you are brought to a stop; the impulse causing the stop would be the same size. But equal-sized impulses may come in different forms: a very large force may act suddenly (large F , small t), or a very small force may act for a long time (small F , large t) or any intermediate values of both, such that the product of F and t is the same.

The bottom line is that the more sudden the stop (the smaller t is), the larger the force needed to result in a sufficient impulse to change the momentum of a person enough to bring him/her to a stop. If the brakes are gently applied, a small force will act that will eventually stop the occupants of the car. If, on the other hand, the car drives into a large tree, the time to stop will be very small, and so the corresponding force will be very large. An understanding of this partnering of force and time is essential, as it is generally a goal to keep the forces on the occupants (and therefore the potential to harm them) as small as possible. This can be achieved by lengthening the time of the impact. Note that this is the time of impact *for the occupants*, which should not be confused with the impact of the car. With no seat belt or airbag, the occupants of a moving vehicle strike the dash, windshield, etc., and are brought to a very abrupt stop (this impact began upon arriving at the dash, etc., and ended very quickly). Seat belts and airbags extend this time greatly by having the collision begin sooner (the airbag is inflated into the person; the seat belt is already at the person). Both the airbag and the seat belt have more “give” than the dash, etc. This means that the collision with these safety features takes place over a greater time, which is accompanied by a reduced force, hence reduced chance of injury.

**Impact speed when dropped from
approximate corresponding heights**

| Speed of Impact | Drops from Approximate Corresponding Heights |
|-----------------|--|
| 10 km/h | 0.4 m |
| 20 m/h | 1.6 m |
| 30 km/h | 3.5 m |
| 40 km/h | 6.3 m |
| 50 km/h | 9.8 m |
| 60 km/h | 14.2 m |
| 70 km/h | 19.3 m |
| 80 km/h | 25.2 m |
| 90 km/h | 31.9 m |
| 100 km/h | 39.4 m |

Protecting a passenger

Instructions: Apply what you have learned about motor vehicle safety features by designing a package that will hold a raw egg as a passenger. The package will undergo a collision by being dropped to the floor. With a well-designed package, the egg will not break. It is your task to design the package well enough so the passenger will survive the impact. The package must be designed within certain specifications. Record these specifications and the height of the drop.

Package Specifications:

Height of Drop:

To help you design your package, answer the following questions **before** you actually build anything.

1. Motor vehicles have many safety features that are designed to lessen the chance of injury and death in the event of a collision. List 3 of these features.

2. For each of the safety features you identified, briefly describe how it is that each helps to keep passengers safe.

3. How could a package be built that has these safety features in place to protect an egg?

4. If the dropping distance was much larger, how would that affect the way you would design your package?

5. Using the words “momentum”, “impulse” and “force”, explain how your package will keep the egg from breaking. (Use back of worksheet.)

Protecting a passenger – Example

Instructions: Apply what you have learned about motor vehicle safety features by designing a package that will hold a raw egg as a passenger. The package will undergo a collision by being dropped to the floor. With a well-designed package, the egg will not break. It is your task to design the package well enough so the passenger will survive the impact. The package must be designed within certain specifications. Record these specifications and the height of the drop.

**Package Specifications: Package no larger than 20 cm of length, width or height
After being dropped, must remove egg from package in less than 30 seconds**

Height of Drop: 3m

To help you design your package, answer the following questions **before** you actually build anything.

- Motor vehicles have many safety features that are designed to lessen the chance of injury and death in the event of a collision. List 3 of these features.
Seat belts, air bags, bumpers, crumple zones, head rests, reinforced passenger compartments
- For each of the safety features you identified, briefly describe how it is that each helps to keep passengers safe.
 - **Seat belts help restrain passengers so they do not hit the dashboard.**
 - **Air bags further restrain passengers, and also allow for a gentler, more spread out force for stopping.**
 - **Bumpers absorb some of the energy of the impact, bringing the rest of the vehicle to a more gradual stop.**
- How could a package be built that has these safety features in place to protect an egg?
 - **Like the passenger in a car, the egg needs to be brought to a gentle stop, with the force acting on it spread over as much of the egg as possible, so the egg should be well cushioned in the package.**
 - **The package itself should absorb the energy, and so could be built to crumple on impact.**
- If the dropping distance was much larger, how would that affect the way you would design your package?
The design would be much more challenging, as the impact would be more severe. The package would need to be stronger, with the egg even better protected and cushioned.

Name(s): _____

5. Using the words "momentum", "impulse" and "force", explain how your package will keep the egg from breaking. (Use back of worksheet.)

The egg will have considerable momentum when the package hits the floor. This momentum will be gone after everything has stopped. An impulse (force acting over time) is needed to change the momentum. A large force would likely break the egg, so the package needs to apply the impulse by extending the amount of time in which the egg actually is brought to a stop. Additionally, the package needs to exert this force over as much of the egg as possible, so a soft padding should encase the egg.

ACTIVITY 5 Manitoba's Driving Laws

Prescribed Learning Outcomes:

Safety SLOs:

- K.3.S2.A.5a** Determine the safety considerations in selected alternative pursuits (e.g. wear protective equipment, watch for weather conditions).
- S.3.S2.A.1** Apply rules and procedures for safe and responsible participation in selected, specific physical activities and environments (e.g. self-regulation, teamwork).

Complementary SLOs:

- K.5.S2.D.2** Evaluate the legal aspects and consequences of substance use, abuse and addiction (e.g. drinking and driving, street drugs, inhalants).
-

Activity Outcomes:

Students will be able to:

- Describe potential driving risks/considerations facing motor vehicle drivers and passengers.
 - Describe the consequences and legal aspects of substance use and driving.
 - Describe aspects of Manitoba's driving laws.
-

Suggestions for Instruction:

NOTE: This activity may take 140 minutes.

- Ask students how well they know Manitoba's driving laws.
- Introduce Activity 5 Worksheet A: *What is the law?* as an overhead.
- Begin with the first page of *What is the law?*
NOTE: Cover up the answers on the right side of the overhead.
- Begin by reading aloud statement #1 and asking students to record on paper whether the statement is True or False.
- Correct each statement and briefly discuss before moving onto the next one.
- Explain to students that they will be divided into small groups and each group will become "the resident expert" on one aspect of Manitoba's driving laws.
- Have students divide into small groups.
- Assign one aspect of Manitoba's driving laws to each group.
- Distribute Activity 5 Worksheets B-K: *Manitoba's driving laws* to the groups.

NOTE:

1) Aspects addressed on the worksheets include:

- B - Graduated Driver Licensing Program;
- C - Auto Theft Prevention 1;
- D - Auto Theft Prevention 2;
- E - Auto Theft – Legal Consequences;
- F - Insurance Fraud and Auto Crimes;
- G - Manitoba's Countermeasure Initiatives to Drugs and Driving;
- H - You Lose!;
- I - Saying "No" to Drinking and Driving;
- J - Tips for Teens;
- K - Merit Mark and Demerit Point Programs

- 2) Students may also base their questions and answers on other information they acquired during these learning activities, as long as they can provide the source.
- Explain that each group will design 3-4 questions and their correct answers on one aspect of Manitoba's driving laws.
 - Once each group has completed their set of questions, have students divide into 3 "expert groups".
 - Have students within each expert group ask group members questions on different aspects of Manitoba's driving laws.
 - Encourage class discussion around these questions.
 - Have students present "Exit-tickets" that reflect 7-8 new pieces of information they learned.
 - Optional follow-up: Play the Motor Vehicle Driving Jeopardy Game as a class, using the student-generated questions.
-

Suggestions for Assessment:

- Use the Teacher Road Safety Checklist to assess the students' abilities to identify potential road risks/considerations facing motor vehicle drivers and passengers. (See Assessment Tool.)
 - Use the Teacher Road Safety Checklist to assess the students' abilities to describe the consequences and legal aspects of substance use and driving. (See Assessment Tool.)
 - Use the Teacher Road Safety Checklist to assess the students' abilities to describe aspects of Manitoba's driving laws. (See Assessment Tool.)
 - Have students rate the quality of each group's questions.
 - Use some of the students' questions on a written test that assesses students' knowledge.
-

Cross-Curricular Connections:

- Physical Education/Health Education (healthy lifestyle practices)
 - English Language Arts (manage ideas and information; explore thoughts, ideas, feelings and experiences; enhance the clarity and artistry of communication; comprehend and respond personally and critically to oral, literary and media texts; celebrate and build community)
-

Opportunities for Family/Community Involvement:

- Invite students to take their questions home and ask their families if they know the answers.
- Play the Motor Vehicle Driving Jeopardy Game with other students in the school.

What is the law?

Instructions: Answer True or False to each statement.

| Statement | Answer |
|---|---|
| 1. You can't be charged with a drinking-driving offence if your blood alcohol content (BAC) is below the legal limit. | False: You can be charged with a criminal offence for driving while impaired by alcohol or drugs, regardless of your BAC. |
| 2. A police officer can suspend your driver's licence immediately for a drinking-driving offence. | True: In most provinces, a police officer can suspend a driver's licence for 12 or 24 hours if you register a "Warn" on an approved screening device. In addition, in some provinces, a police officer can, on behalf of the registrar of motor vehicles, suspend your licence for 90 days if you fail a breath test or refuse to provide a breath sample. |
| 3. If you have one drink per hour, you don't have to worry about being over the legal limit. | False: The "one drink per hour" rule only works for the first two or three hours. It does not work for women. Restrict yourself to no more than two drinks. Better yet, don't drink if you are going to drive. |
| 4. You can't be charged with a drinking-driving offence if you are riding a snowmobile on your own property. | False: Impaired driving laws apply to all types of motor vehicles regardless of where they are being operated. |

Instructions: Answer True or False to each statement.

5. An impaired driving charge isn't such a big deal. You simply pay the ticket and everything's fine.

False: Impaired driving is a criminal offence. You will be photographed and fingerprinted. You must appear in court. Among other things, a conviction results in a criminal record. You can go to jail; for a second offence, you **will** go to jail.

6. Only young drinking drivers are at higher risk of crashing.

False: Drinking drivers of all ages have an increased risk of crash involvement. In general, risk increases with BAC. However, the risk for young drivers increases much more rapidly due to their inexperience as drivers, peer pressure, and the impact of even small amounts of alcohol.

7. The worst way to tell if someone has had too much to drink to drive safely is to ask him/her.

True: This is one of the most unreliable ways to tell. A person's judgment is seriously affected by alcohol and they often overestimate their abilities.

8. If you think you've had too much to drink to be able to drive safely, you'll be OK if you have a cup of coffee or take a cold shower.

False: Time is the only way to reduce your BAC. Depending on how much you have to drink, it can take many hours for your BAC to return to zero.

Manitoba's driving laws

Graduated Driver Licensing Program

Rationale:

- Manitoba has introduced the Graduated Driver Licensing (GDL) Program to save lives and make highways safer for all motorists.
 - Statistics show that novice drivers tend to have a higher collision rate than more experienced drivers.
 - Studies have shown that the introduction of GDL Program can reduce the number of collisions among novice drivers by 37%.
 - GDL Program will apply to all novice drivers regardless of age.
-

Novice drivers (existing and new learner licence holders and probationary drivers) must:

- a) hold a learner licence for a minimum of 9 months;
 - b) have fully licensed supervising driver with 3 years' experience in front seat at all times;
 - c) carry passengers only in back seat up to number of seat belts;
 - d) have zero blood alcohol concentration (BAC) at all times while driving;
 - e) refrain from towing any vehicles.
-

Once the mandatory road test is passed, the intermediate stage driver must:

- a) stay at this level for 15 months;
 - b) drive with only 1 passenger in front seat and passengers in back seat limited to number of seat belts between 5:00 am and midnight;
 - c) carry only 1 passenger between midnight and 5:00 a.m., or if accompanied by a qualified supervising driver, may carry passengers in the rear seat up to the number of seat belts;
 - d) maintain a 0 BAC at all times while driving;
 - e) may drive Class 3 farm trucks.
-

After 15 months in the intermediate stage, novices automatically become fully licensed drivers. These drivers must:

- a) maintain a 0 BAC at all times while driving for a period of one year.
-

For more information: Please contact the Driver Licence Information at (204) 945-6850.

Manitoba's driving laws

Auto theft prevention 1

In 1992 the City of Winnipeg had the lowest rate of auto theft of any major city in Canada. In 1993, that trend changed. Theft techniques were quickly spreading amongst the criminal element all across North America.

Auto theft affects us all through higher insurance rates, property damage, personal injuries, and sometimes even death.

Auto theft cost \$20.5 million in 1999.

Motives for auto theft include – but are not limited to – joyriding, transportation, and financial gain from selling the vehicle or its parts.

Auto theft can be reduced significantly if owners adopt some simple, common sense habits.

- Do not leave your vehicle running unattended
- Do not leave keys in or hidden on your vehicle
- Do not label your keys so that they identify with either your vehicle or yourself
- Park in well lit, busy areas

There are many other approaches to auto theft prevention that you will find described or referred to on this website:

www.cfcawinnipeg.com/web/autos.html

The number of vehicles stolen in Winnipeg each year shows that auto theft is steadily on the rise.

- 1990 - 2,388
- 1991 - 2,400
- 1992 - 2,411
- 1993 - 6,508
- 1994 - 7,849
- 1995 - 7,887
- 1996 - 8,349
- 1997 - 9,033
- 1998 - 8,470
- 1999 - 8,710
- 2000 - 10,791

Source WPS

Manitoba's driving laws

Auto theft prevention 2

In Manitoba, one vehicle is stolen every hour.

About 80% of these thefts happen in Winnipeg neighbourhoods.

Over the last 10 years, auto theft in Manitoba has increased 400%. That means you're at greater risk than ever of having your vehicle stolen.

Auto theft happens fast

If you're not taking anti-theft measures, experienced thieves can steal your vehicle in less than 30 seconds.

The good news is that you can take simple steps that will reduce your risk and help save you a ton of aggravation. Theft doesn't have to happen to you.

Delay the thief – save your car!

The best way to prevent auto theft is to put up barriers to delay the thief.

Once you delay thieves beyond three minutes, they'll likely give up and try an easier target. Or, if they know some of these barriers are in place, they may bypass your vehicle altogether.

Three layers of protection

The Insurance Crime Prevention Bureau – a Canadian organization dedicated to reducing auto crime – recommends three “layers” of protection, from lower- to higher-level protection.

Layer 1 – Use common sense

- Lock your doors;
- Shut off your engine when leaving your vehicle and take your keys with you;
- Remove valuables from your vehicle or at least store them out of view;
- Park in well-lit areas.

Layer 2 – Use visible and audible anti-theft devices

When potential thieves see a lock device on your steering wheel, or know you've got an alarm system, they may move on to an easier target. Although experienced thieves can overcome these devices, it takes extra time. These devices are especially effective in deterring “joyriders”.

Layer 3 – Install and use a Vehicle Insurance Centre of Canada (VICC) approved immobilizer

These devices are the most effective on the market because they're wired into several components of your vehicle's electrical system. When a thief tries to steal your car, the device shuts down its electrical system so it won't start. Thieves can't overcome these devices.

Names: _____

Premium discounts available

Manitoba Public Insurance provides annual Autopac discounts for anti-theft devices approved by the Vehicle Information Centre of Canada (VICC). Discounts range from about \$20 to \$100 every year, depending on your vehicle.

Currently more than 100 vehicle models carry this discount because they are armed with factory-installed devices that are VICC-approved. There are also three after-market devices that can be installed in older vehicles.

- PFK Auto Watch model 329Ti Immobilizer
- Magtec 6000 Immobilizer
- PowerLock-Canada

These devices have proven effective in substantially reducing the risk of theft. Availability and prices may vary, so check with local auto electronic stores.

To get the discount, you must have a VICC-approved immobilizer installed by a VICC-approved installer. You can get a list of VICC-approved installers by visiting the VICC Web site at www.vicc.com. Or, you can call **(204) 985-7000** and the list will be sent to you.

Once you've had a VICC-approved device properly installed, take your VICC Installation Registration form to your Autopac agent who will process your discount.

Combat Auto Theft (CAT)

Here's a special theft deterrent to consider that's free and effective.

You can get a CAT sticker for your vehicle, which identifies it to the police. By displaying the sticker you're telling the police that your vehicle is not normally on the road after 1:00 a.m. If the police spot your vehicle being driven after 1:00 a.m., they'll stop it to ensure that it hasn't been stolen.



Source: Manitoba Public Insurance

www.mpi.mb.ca

Manitoba's driving laws

Auto theft - legal consequences

- If you steal and damage a car, Manitoba Public Insurance has the legal power to go after you or anyone else who is responsible for causing the damage.

Why does Manitoba Public Insurance do that?

Because MPI doesn't want anyone to become a victim of auto theft! Stealing a car is a crime that costs innocent people their peace of mind and their money.

Before you steal a car, or even think about joining your friends in a "hot" vehicle, think about this:

- Passengers can also be convicted in the courts for joyriding, or auto theft. Even if you're not driving the stolen car, you can be required to pay for the damages caused by that vehicle!
- If you vandalize a car, MPI will also go after you through the courts for the cost of the damage.
- Don't think because you stole the car when you were 11 or 12, everything will be A-okay when you turn 16. NOT!!

Think about this: If you owe money to MPI, unless you make arrangements to pay up, you won't be able to get a driver's licence when you turn 16. Once you start paying, you'll be able to apply for your licence.

- If your licence is suspended (taken away) in Manitoba, the suspension carries over to every other Canadian province, and into the United States.
- No matter how old you are, MPI can go after you through the courts for the damage you caused when stealing or vandalizing an automobile.
- Forget about getting insurance for your car if you owe money to MPI. Your name will be on MPI's permanent records and unless you make arrangements to pay, you will be restricted from obtaining insurance.
- Once you've got a job you could lose some of your money. That's right! MPI can apply to the courts to take a cut of your pay cheque.

Your parents could be made to pay your damages. Under the Parental Responsibility Act, MPI can legally go after your parents.

Source: Manitoba Public Insurance website

www.mpi.mb.ca

Manitoba's driving laws

Insurance fraud and auto crimes

Auto theft is more common than people think. In fact, recent statistics show that a high number of vehicle thefts take place in open areas where large numbers of people are circulating. Basically, it's common enough to increase everyone's vehicle insurance costs. So as long as we're all paying for auto theft, it makes sense to take whatever precautions we can, especially when you consider these statistics:

- Total number of vehicle thefts in Manitoba in 2000 - 10,791
Winnipeg total - 9,329
Rural total - 1,462
- Total cost of theft claims in 2000 - \$22.8 million.

Manitoba Public Insurance has adopted a multi-pronged approach to combating auto theft:

- MPI provides nearly \$500,000 in funding to the Winnipeg Police Services' Auto Theft Unit.
- MPI's Special Investigation Unit is dedicated to solving vehicle-related crimes. Last year their investigations resulted in savings estimated at \$5 million.
- Through the Justice system, MPI pursues adults and juveniles convicted of vehicle-related crimes, including theft, to help recover the costs associated with theft.
- MPI supports Project 6116, the first comprehensive effort to co-ordinate the actions of stakeholders dedicated to finding the solution for the social problem of auto theft.
- In keeping with MPI's history of actively working to fight auto crime across the province, MPI is helping strengthen and revitalize the Citizens on Patrol Program (COPP).

MPI's battle against auto theft also includes:

- the Combat Auto Theft (CAT) program
- funding for parking lot awareness audits and the new CFCA website through HEATT grants
- rate discounts for the PFK Autowatch, Magtec 6000, PowerLock-Canada, and Theftbuster TB300V anti-auto theft devices
- a 50% rebate to those motorists with \$500 and \$300 deductibles whose anti-theft device was in use and defeated by a thief.

www.mpi.mb.ca/english/fraud/autotheft.html

Manitoba's driving laws

Manitoba's initiatives against impaired driving

Table 1 – Provincial/Territorial Countermeasures Initiatives

| Province/ Territory | Roadside Licence Action | BAC (mg%) | Young Driver BAC | Pre-Conviction Licence Action | Licence Suspension (months) | | | Vehicle Impoundment (days) ⁱ |
|------------------------|----------------------------|--------------|---------------------|----------------------------------|------------------------------------|-------------------------------------|---------------------------------------|---|
| | | | | | 1st Offence | 2nd Offence | 3rd Offence | |
| Newfoundland | 24 hrs | 50 | zero ^a | - ^b | 12 | 24 | 36 | - |
| Prince Edward Island | 24 hrs | 50 | zero | 3 month suspension | 12 | 36 | 60 | 30 |
| Nova Scotia | 24 hrs | 50 | zero ^a | 3 month suspension | 12 | 36 | indefinite ^c | 90 ^d |
| New Brunswick | 24 hrs | 50 | zero ^a | - | 12 | 36 | 60 | - |
| Quebec | - | 80 | zero ^a | 2 week suspension | 12 | 36 | 60 | 30 |
| Ontario | 12 hrs | 50 | zero ^a | 3 month suspension | 12 | 36 | life ^c | 45 |
| Manitoba | 24 hrs | 50 | zero ^a | 3 month suspension | 12 ^e 60 ^f | 60 ^e 120 ^f | 120 ^g life ^f | 30 |
| Saskatchewan | 24 hrs | 40 | zero ^a | 3 month suspension | 12 | 36 | 60 | 30 |
| Alberta | 24 hrs | 50 | zero ^h | 3 month suspension | 12 | 36 | 60 ^h | 30 |
| British Columbia | 12-24 hrs | 50 | zero ^a | 3 month probation | 12 | 36 | indefinite | 30 |
| Yukon | 24 hrs | 80 | zero ^a | 3 month probation | 12 | 36 | indefinite | 30 |
| Northwest Territories | 12-24 hrs | 80 | - | - | 12 | 24 | 36 | - |

^a Includes all novice drivers ^b License action in this category exists for novice drivers only ^c Reducible to 10 years ^d Given Royal Assent December 3, 1998 ^e Category "A" offences only (driving while impaired, driving over .08, refusal to provide sample). Greater penalties exist in this category for Failure to Provide a Breath Sample ^f Category "B" offences only (driving while impaired causing death or bodily harm). ^g Fourth offence = lifetime ban ^h Pending ⁱ Figures listed in this column represent only minimum penalties

www.tc.gc.ca/roadsafety/tp1535/smashed/drugsdriving-tables.htm

Table 2: Criminal Code Penalties for impaired driving offences

| Offence | | Penalties | | |
|--|-------------------------------------|---------------------------------------|--------------------------------------|---|
| | | Prohibition from Driving (mandatory)* | Fine** | Jail** |
| Driving While Impaired BAC Over .08 (refusal to provide sample) | 1st Offence: Summary Indictment | 12 to 36 months 12 to 36 months | \$600 to \$2,000 \$600 no maximum | 0 to 6 months 0 to 60 months |
| | 2nd Offence: Summary Indictment | 24 to 60 months 24 to 60 months | up to \$2,000 no maximum | 14 days to 6 months 14 days to 60 months |
| | 3rd+ Offence: Summary Indictment | 36 months to lifetime ban | up to \$2,000 no maximum | 90 days to 6 months 90 days to 60 months |
| Impaired Driving Causing Bodily Harm | Indictment | up to 10 years | no maximum | up to 10 years |
| Impaired Driving Causing Death | Indictment | up to 10 years | no maximum | up to life imprisonment |

* The *Criminal Code's* driving prohibition is distinct from any driver license suspension that a province/territory may impose. Under the *Criminal Code*, an offender may be authorized to drive during the remainder of the prohibition period, provided the offender is registered in a provincial/territorial ignition interlock device program. The start date may be set by a judge as follows: 1st offence - after at least 3 months of the driving prohibition has been served; 2nd offence - after at least 6 months of the driving prohibition has been served; 3rd offence - after at least 12 months of the driving prohibition has been served.

** Mandatory penalties in addition to prohibition from driving are as follows: 1st offence - \$600 minimum fine; 2nd offence - minimum 14 days imprisonment; 3rd offence - minimum 90 days imprisonment.

Vehicle Seizure and Impoundment**In Manitoba, both privately owned and rental vehicles can be seized if:**

- You drive when your licence is suspended or you are disqualified from driving.
- You drive a vehicle while impaired (BAC over .08).
- You refuse to provide a breath sample to police when asked.
- You use your vehicle for a prostitution-related purpose and are charged with an offence.

Other consequences:

- 24-hour licence suspension and driving disqualification on the spot for driving with a BAC over .05 or refusing to provide a breath or blood sample.
- Residents of Manitoba must pay a \$40 fee to reinstate a licence suspended for 24 hours.
- Automatic three-month administrative licence suspension and driving disqualification for driving over .08 or refusing to provide a breath or blood sample.
- You may face criminal charges and serious sanctions, including imprisonment, for driving with a BAC over .08.
- A one-year driver's licence suspension for a first conviction for driving with a BAC of .08 or more, and a five-year suspension on a second conviction within a five-year period.
- A two-year driving licence suspension for a first conviction of refusing to provide a blood or breath sample, and a seven-year suspension for a second conviction.

If your vehicle is seized and towed...

If the vehicle you are driving is seized or towed, there may be charges for towing and storage. In the case of a rental vehicle, these charges can be added to your rental bill.

Ultimately, it is up to you to know what is legal.

If you have questions or need to know more about the rules of Manitoba's roads, contact the Suspension and Records Branch of the Division of Driver and Vehicle Licensing at 945-6945, or 1-800-282-8069 toll-free from rural Manitoba.

Last revised: September, 2000

Manitoba's driving laws

You Lose!

Impaired driving laws

Manitoba has impaired driving laws, which include:

- Vehicle impoundment for driving over .08 or refusing to provide a breath or blood sample;
- Increasing the driver's licence suspension, ranging from one year to life;
- Zero Blood Alcohol Content (0 BAC) for new drivers;
- Applying all impaired driving sanctions to off-road vehicles.

What are the consequences?

New drivers who violate the 0 BAC restriction will be subject to a 24-hour immediate roadside suspension and will be required to attend a show cause hearing to consider a further driver licence suspension.

If you drive a motor vehicle or an off-road vehicle and have a BAC between .05 and .08 you will face a variety of consequences that may include:

- An immediate 24-hour licence suspension;
- A \$40 fee for reinstatement of your licence;
- A mandatory impaired driver's assessment at a cost of \$300 if more than one 24-hour suspension in three years.

If your BAC is over .08 or you refuse to provide a breath or blood sample to police, you will face additional consequences:

- An immediate automatic three-month administrative licence suspension;
- Vehicle impoundment;
- A mandatory impaired driver's assessment at a cost of \$300;
- A licence surcharge premium of up to \$999 to Manitoba Public Insurance;
- Completion of a driver's exam or a driving course at a cost of \$35 - \$120.

All fees subject to change.

www.gov.mb.ca/justice/youlose/impaireddrivinglaws.html

Manitoba's tough new sanctions for drunk drivers

If you still think it's okay to drink and drive, you're wrong.

More than a third of fatal crashes on Manitoba roads involve drivers who have been drinking.

That's why Manitoba is introducing tough new sanctions targeted at drunk drivers that could see you:

- **Lose** your driver's licence. Suspensions can range from one year to life
- **Lose** your vehicle for a minimum of one month
- **Lose** your freedom – offenders could spend up to life in prison
- **Lose** your reputation and gain a criminal record
- **Lose** thousands of dollars in fines, assessments and higher insurance costs
- **Lose** future job and travel opportunities as a result of your criminal record

Remember, if you drink and drive in Manitoba, you have a lot to lose.

www.gov.mb.ca/justice/youlose/consequences.html

Manitoba's driving laws

Saying “no” to drinking and driving

No Thanks — I'm Driving

Put simply, if you're drinking, don't drive. If you need to go from one place to another, assign a designated driver, call a cab or take public transportation. It's never more complicated than that. There are other actions you can take to ensure your safety and the safety of those around you:

- Never drink on an empty stomach. Have something to eat before you start drinking. While eating won't necessarily prevent you from getting drunk, the food spreads the alcohol absorption over a longer period of time.
- Pay attention to the strength of your drinks.
- Don't be offended if someone suggests that you've had too much to drive safely. They are probably right. They're only looking out for you. Friends don't let friends drive after drinking too much.
- If you aren't sure whether you're impaired, you probably are. Alcohol impairs even that basic judgment. Better to err on the side of caution than to take a chance and regret it later.

It's All Fun and Games Until Someone Drives Drunk

People who serve alcoholic beverages, both in public establishments and in private residences, are legally liable for damages caused by their patrons or guests even after they have left the premises. This places the responsibility on servers to ensure guests do not drive if they have had too much to drink.

Outlined below are a few of the many ideas to safely and responsibly enjoy and serve alcohol.

- Don't push drinks on your guests. If they say “no thanks”, offer them a non-alcoholic beverage. Always have a variety of non-alcoholic alternatives available.
- Avoid an open bar. Not only do people tend to drink more than usual, but you have no control over how much they drink.
- Have food available throughout the evening. Remember, though, that salty snack foods can cause people to drink more.
- Don't drink too much yourself. You need to be alert to changes in the behaviour of your guests. If someone is getting a little too noisy or rowdy, you may have to refuse to serve them any more drinks. You also have to be able to determine if any of your guests have had too much to drive home safely and take action to prevent them from doing so. You can't do this properly if you are intoxicated.

- Discontinue serving drinks a few hours before the party's over. Ensure that food and non-alcoholic beverages are available and encourage your guests to stay for refreshments before they go home.
- Have cash on hand for cab fares. Also, be prepared to have overnight guests.
- When inviting guests, remind them that alcohol will be served and they should plan ahead to take a cab, use a designated driver, or stay overnight.

The Passenger Doesn't Have to be Passive

Passengers can influence the drinking choices of their companions.

- Talk about the plan for the evening and ensure it includes a clear decision about who is driving home. If there are problems, pick an appropriate time to express your concerns calmly and rationally. Be ready to suggest alternatives.
- Refuse to ride with a driver who has had too much to drink. Call a friend or relative. Or use that cash you put away for a cab.
- If your companion suggests that you drive home because you have had less to drink, and you don't feel safe doing so, say so and suggest an alternative.

www.tc.gc.ca/roadsafety/tp1535/smashed/drugsdriving4.html

Manitoba's driving laws

Tip for Teens

Focus on . . . the Young — A Special Group

Youth are special because over the past several years, teens have responded particularly well to the problem of drinking and driving. During the past decade, teens have had the greatest decrease in the rate of involvement in alcohol-related crashes compared to other age groups. Many young people show tremendous responsibility and provide a good example to others. They have embraced the designated driver concept, and it has become socially acceptable to abstain from drinking if they are driving.

Nevertheless, young drivers continue to be at a higher risk of crashing after consuming even small amounts of alcohol. In addition, young people often tend to ride around together in groups, which compounds the effects of a drinking and driving tragedy.

Many of the typical suggestions for preventing impaired driving aren't applicable to the drinking situations of young people. For starters, since it is illegal for youth under 18 to purchase alcohol, those who drink anyway tend to be unsupervised. They may drive to a remote location to drink. They often drink in groups, where peer pressure to conform can be overwhelming.

Tips for Teens

- There's nothing embarrassing about not wanting to lose your licence or risk getting maimed or killed because of drinking and driving. Talk about drinking and driving with your friends. Help everyone understand that the risks are high, even after a drink or two. If you use a designated driver, make sure he or she doesn't have any alcohol to drink at all.
- If your driver has been drinking, don't get in the car! Call your parents, a friend or relative to come and get you. Sure, they may not like the idea of having to go out in the middle of the night because you and your friends have been doing something you probably shouldn't have been doing. But by morning, they will probably realize that going to get you was a whole lot better than a visit to the hospital – or the morgue.
- Carry some extra cash so that you can call a cab if necessary.
- Don't be pressured into having "just one". Graduated licensing and zero tolerance laws mean that you risk losing your licence if you drive after having anything to drink.
- Graduation is a time of celebration. Don't let drinking and driving spoil the party. Promote the "Safe Grad" concept – encourage alternatives to drinking and make sure everyone has a safe ride home.

www.tc.gc.ca/roadsafety/tp1535/smashed/drugsdriving5.html

Manitoba's driving laws

Merit mark and demerit point programs

The Division of Driver and Vehicle Licencing maintains three driver improvement and insurance programs:

- The Manitoba Merit Mark Program;
- The Division of Driver and Vehicle Licencing (DDVL) Safety Demerit Point and Driver Improvement Program; and
- The Manitoba Public Insurance (MPI) Demerit Point, Insurance Premium, Surcharge, and Discount Program.

The Manitoba Merit Mark Program

Merit marks are awarded to drivers as an incentive to maintain safe and legal driving practices. One merit mark is awarded for each two-year period during which the driver:

- is not assessed any demerit points;
- does not have any previously assessed demerit points;
- holds a valid and continuous Manitoba driver's licence of any class other than a class 7 (learner's licence);
- is not suspended or prohibited from driving; and
- is not assessed a surcharge by MPI as a result of two or more accident insurance claims.

The maximum number of merits that can be awarded to each driver is five.

Merit marks reduce any subsequent demerit points. One merit mark equals two demerit points.

New residents to Manitoba may also be issued a merit mark upon application for a Manitoba driver's licence. An out-of-province driver with a clean driving record from Canada or the United States may be awarded one merit mark on the date of transfer or on their 18th birthday, whichever is later.

DDVL Safety Demerit Point and Driver Improvement Program

Probationary Licence Program

A probationary driver's licence is issued to new drivers who have not held a driver's licence (other than class 7 licence) for at least one continuous year, within the last five years. If a driver with a probationary licence is convicted of a driving offence, the driver's licence may be suspended for up to 12 months. The licence issued after the suspension will be probationary for a further 12 months.

From Manitoba Highways and Transportation. Driver and Vehicle Licencing. *Driver's Handbook*.

DDVL Safety Demerit Point System

DDVL safety demerit points are assessed to monitor a driver's conviction and accident involvement to determine if departmental intervention is warranted. Demerit points are assessed when a driver:

- a) is convicted of certain driving offences. Point assessments range from two demerits for a minor driving offence to 15 demerits for the most serious driving offence; or
- b) is partially or fully responsible for an accident reportable to the police (a responsible accident). Two safety demerit points are assessed for each of these accidents.

Note: Although they may appear similar, the DDVL Safety Demerit Point System and the MPI Demerit Point System are not equivalent.

Driver Improvement Interview

Drivers who accumulate six or more safety demerit points may be requested to attend a personal driver improvement interview. At this interview, drivers are placed on probation for 12 to 24 months and may be required to complete driver examinations, a driver safety course, or other requirements as necessary.

Show Cause Hearing

If, during a probation period, a driver is convicted of a traffic offence or is responsible for a traffic accident, the driver may be required to "Show Cause" why their licence should not be suspended.

MPI Demerit Point, Insurance Premium, Surcharge, and Discount Program**Driver Insurance and Discount Program**

Manitoba drivers contribute to the insurance fund with the basic insurance premium of \$45 on their drivers' licences. This premium helps offset the cost of providing injury benefits for victims of motor vehicle accidents anywhere in Canada and the United States.

All Manitoba residents are entitled to receive compensation for financial losses they incur as a result of being injured in motor vehicle accidents anywhere in Canada and the United States.

As well, third-party liability coverage up to \$200,000 is provided to Manitoba drivers who unknowingly operate an uninsured motor vehicle.

For further details, please see the Autopac policy guide.

From Manitoba Highways and Transportation. Driver and Vehicle Licencing. *Driver's Handbook*.

Drivers are eligible to have their basic driver's licence insurance premium discounted by \$5 for each merit mark held, if a driver:

- 1) has not been convicted of any major traffic convictions occurring during the 24-month period preceding the first day of the month following the driver's birth month; and
- 2) has not been found 50% or more responsible by MPI for an accident during the 12-month period preceding the first day of the month following the driver's birth month.

MPI Demerit Point System

MPI demerit points are assessed to determine drivers' insurance risk. Based on the number of MPI demerit points, drivers may be charged additional insurance premiums above the basic insurance premium paid by all licenced drivers.

The demerit points are assessed when a driver is convicted of certain driving offences. Point assessments range from two demerits for a minor driving offence to 15 demerits for the most serious driving offence.

Note: Although they may appear to be similar, the MPI Demerit Point System and the DDVL Demerit Point System are not equivalent.

Additional MPI Driver's Licence Insurance Premiums (Charge I)

The assessment of additional premiums is determined by the number of MPI demerit points accumulated up to and including the last day of the driver's birth month according to the following table:

MPI Demerit Points Premium Assessment

| | | | |
|-------|--------|----|--------|
| 1 – 5 | \$ 0 | 14 | \$ 500 |
| 6 | \$ 200 | 15 | \$ 550 |
| 7 | \$ 225 | 16 | \$ 625 |
| 8 | \$ 250 | 17 | \$ 700 |
| 9 | \$ 275 | 18 | \$ 775 |
| 10 | \$ 300 | 19 | \$ 850 |
| 11 | \$ 350 | 20 | \$ 925 |
| 12 | \$ 400 | 21 | \$ 999 |
| 13 | \$ 450 | | |

From Manitoba Highways and Transportation. Driver and Vehicle Licencing. *Driver's Handbook*.

MPI Surcharge Based on At-Fault Claims (Charge II)

Drivers found by MPI to be 50% or more responsible for two or more accident claims during a continuous 36-month period are assessed a surcharge on their driver's licence:

| | |
|--|------------|
| Second accident within 36 months | \$400.00 |
| Third accident within the same 36-month period | \$800.00 |
| Each additional accident within the same 36-month period | \$1,200.00 |

As well, a first accident surcharge of \$200 will be charged only to people who were not the "owner of record" of a registered motor vehicle on the date of the at-fault claim; that is, their driver's licence number was not recorded on a motor vehicle registration. For this purpose, only accidents occurring after November 30, 1992, will be subject to the surcharge.

DDVL and MPI Demerit Point Reduction Schedule

A driver is entitled to a reduction in:

- DDVL safety demerit points if they were not responsible for a traffic accident or have not been convicted of a traffic offence occurring in the 12 months following their last offence or accident; and
- MPI demerit points if they have not been convicted of a traffic offence occurring in the last 12 months following their last offence.

Both DDVL and MPI demerit points reduce according to the same schedule:

| POINTS | REDUCTION | POINTS | REDUCTION |
|-----------|--------------|--------------|---------------|
| 1, 2 or 3 | Reduced to 0 | 15 or 16 | Reduced to 10 |
| 4 | Reduced to 1 | 17 | Reduced to 11 |
| 5 | Reduced to 2 | 18 or 19 | Reduced to 12 |
| 6 | Reduced to 3 | 20 | Reduced to 13 |
| 7 or 8 | Reduced to 4 | 21 or 22 | Reduced to 14 |
| 9 | Reduced to 5 | 23 | Reduced to 15 |
| 10 | Reduced to 6 | 24 or 25 | Reduced to 16 |
| 11 or 12 | Reduced to 7 | 26 or 27 | Reduced to 17 |
| 13 | Reduced to 8 | 28, 29 or 30 | Reduced to 18 |
| 14 | Reduced to 9 | 31 or more | Reduced by 13 |

From Manitoba Highways and Transportation. Driver and Vehicle Licencing. *Driver's Handbook*.

ACTIVITY 6 Say It On The Radio

Prescribed Learning Outcomes:

Safety SLOs:

- K.3.S2.A.5a** Determine the safety considerations in selected alternative pursuits (e.g. wear protective equipment, watch for weather conditions).
- S.3.S2.A.1** Apply rules and procedures for safe and responsible participation in selected, specific physical activities and environments (e.g. self-regulation, teamwork).

Complementary SLOs:

- K.5.S2.D.2** Evaluate the legal aspects and consequences of substance use, abuse and addiction (e.g. drinking and driving, street drugs, inhalants).
-

Activity Outcomes:

Students will be able to:

- Describe potential driving risks/considerations facing motor vehicle drivers and passengers.
 - Describe the consequences and legal aspects of substance use and driving.
 - Design a road wise public service announcement that promotes motor vehicle driver and passenger safety.
-

Suggestions for Instruction:

NOTE:

- 1) Students need to be familiar with social marketing/advertising and persuasive techniques.
 - 2) This activity may take 140 minutes.
- Explain to students that they will select a potential driving risk/consideration facing motor vehicle drivers and design a road wise public service announcement (PSA) for a targeted audience.
 - Divide students into pairs or small groups.
 - Explain that students are to design a road wise PSA that:
 - a) promotes a road wise message (e.g. speed kills; don't drink and drive; prevent auto theft, use an anti-theft device; deadly driving distractions; defensive driving; responsible driving; buckle up; Graduated Driver Licensing Program; stealing a car is no joke);
 - b) targets students at a specific grade level (e.g. Middle Years, Senior Years), or parents/adults;
 - c) enhances the message using sound effects and/or music.
 - Introduce Activity 6 Worksheet A: *Say it on the radio* as an overhead.

NOTE: The following are elements of an effective PSA:

- 1) Attention: Message that catches the listener's attention (e.g. relevant, attractive, humorous, suspenseful); often a slogan is used to reinforce the message (i.e. speed kills);
- 2) Interest: Create an interest in the listener for the idea/message;
- 3) Desire: Create a desire or a need for the idea/message;
- 4) Action: Move the listener to act in the way the PSA designer wants, often by providing the listener with a way to follow up (specific directions and organization to contact)
- 5) Length: An effective PSA is about 30 seconds long.

Source: Modified from Susan Barclay et al. *Canadian Students' Guide to Language, Literature, and Media*. Don Mills, Ontario: Oxford University Press, 2001.

- Introduce Activity 6 Worksheet B: *Sample evaluation of public service announcement* to students so they are familiar with the assessment rubric for this activity.
 - Submit Activity 6 Worksheet A: *Say it on the radio* for teacher review.
 - Have students tape their PSAs.
 - Optional follow-up: Design accompanying posters to display with PSAs.
 - Once the road wise PSAs are prepared/taped, present them to the class.
 - Have students rate the PSAs using Activity 6 Worksheet B: *Sample evaluation of public service announcement*.
-

Suggestions for Assessment:

- Ask students to explain their PSAs (e.g. the road wise message, target audience).
 - Evaluate other students' PSAs. A sample assessment rubric is provided in Activity 6 Worksheet B: *Sample evaluation of public service announcement*.
 - Use the Teacher Road Safety Checklist to assess students' knowledge of how PSAs promote motor vehicle driver and passenger safety. (See Assessment Tool.)
-

Cross-Curricular Connections:

- English Language Arts (explore thoughts, ideas, feelings and experiences; comprehend and respond personally and critically to oral, literary and media texts; manage ideas and information; enhance the clarity and artistry of communication; celebrate and build community)
 - Physical Education/Health Education (healthy lifestyle practices)
-

Opportunities for Family/Community Involvement:

- Play these PSAs over the local public announcement (PA) system in the school.
- Play these PSAs on local radio stations in the community.
- Display the posters accompanying the PSAs in the Northern Store, the Band office, or local RCMP detachment office.

Say it on the radio

Activity 6 Worksheet A
Name: _____

Instructions: Design and tape a radio PSA that reflects a road wise message.

MESSAGE:

Make it clear, simple, short, appealing.

TARGET AUDIENCE:

Select a specific target audience.

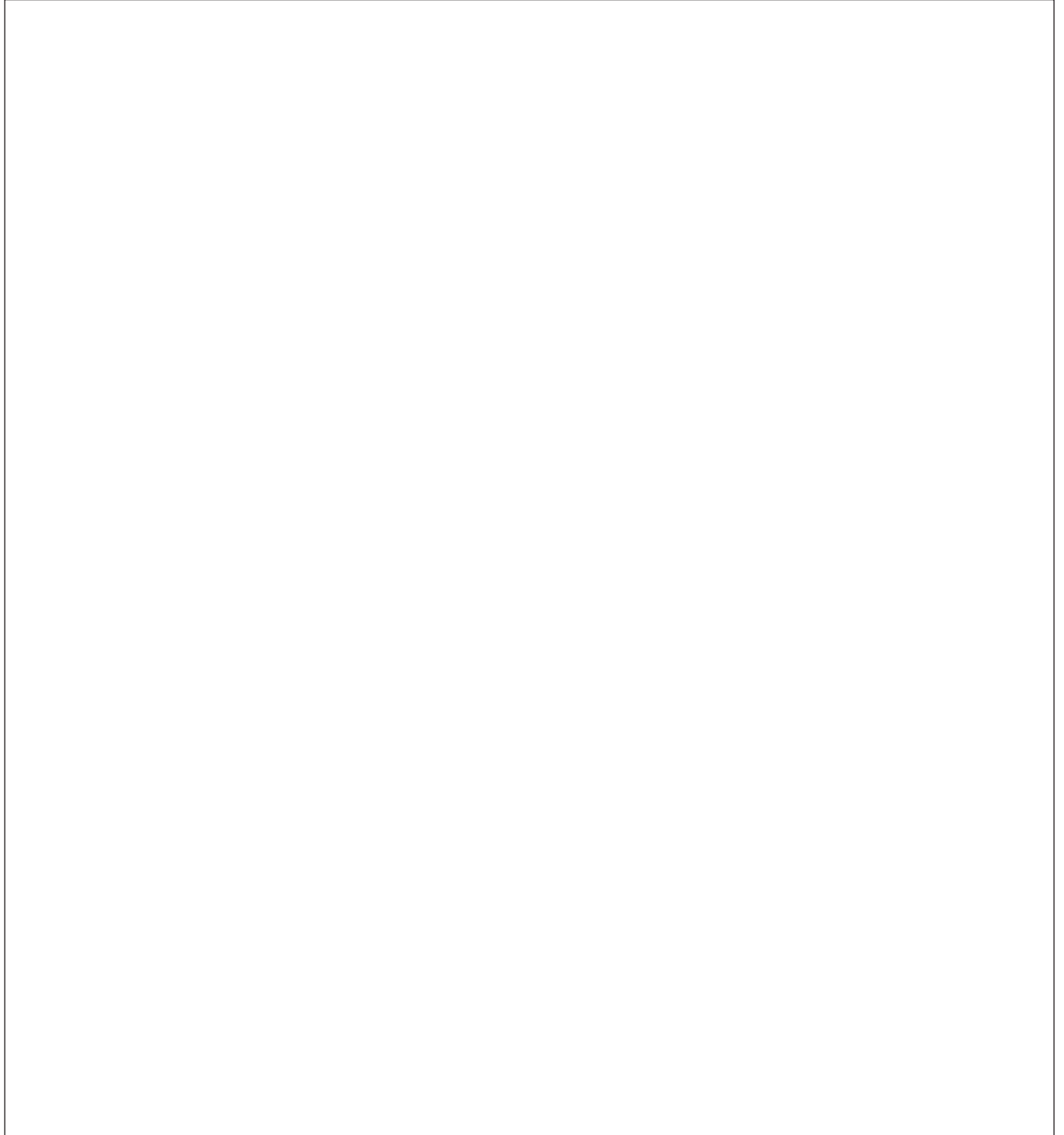
PERSUASION TECHNIQUES USED:

Choose a persuasion technique that best suits your target audience (e.g. appealing to emotions). Carefully select the choice of words, any visual images, music/sound effects.

LENGTH: no more than 30 seconds.

Name: _____

WRITE A DRAFT OF YOUR SCRIPT: If more space is needed, use the back of this page.



TAPE YOUR PSA.

Sample evaluation of public service announcement

Instructions: Please rate each evaluation criteria using the Scale:

| | |
|--------------------|------------------|
| 1 = unsatisfactory | 2 = satisfactory |
| 3 = very good | 4 = excellent. |

/ 12 Content:

- Accurate, clear road wise message
- Informative
- Attention getting

/ 12 Organization:

- Well-planned
- Order of information is logical and enhances message
- Completed PSA

/ 28 Style and Presentation:

- Appropriate persuasive technique for target audience
- Appropriate word/language choice
- Words clearly spoken and easily heard
- Music appealing to target audience
- Appropriate sound effects/music
- Appealing visual images
- Appealing to emotions

/ 4 Script:

- Involved all group members in presentation

/ 12 General Impression:

- Effective
- Appealing
- Creative

Total:

/ 68 marks

GLOSSARY

Alcohol Content Over .08:

Alcohol content over .08 refers to a conviction under Section 253 (b) of the Criminal Code of Canada. This conviction relates to the operation or care or control of a motor vehicle by a person with a blood alcohol concentration (BAC) exceeding 80 milligrams (mg) of alcohol in 100 millilitres (ml) of blood. The offence is supported by empirical data in the form of breathalyzer readings or a blood test.

Blood Alcohol Concentration (BAC):

Blood alcohol concentration refers to the amount of alcohol present in a person's bloodstream. BAC is expressed as a percent. It can be measured by a chemical analysis of the blood, urine or breath. It is commonly accepted that a driver's abilities are impaired with a BAC of .03 to .05. A driver with a BAC of .08 is driving under the influence and can be charged under the Criminal Code of Canada.

Controlled Intersection:

This refers to an intersection that is regulated by either a traffic signal or sign, i.e. traffic lights, stop sign, railway crossing.

Force:

Force is the entity that causes mass to accelerate.

Graduated Driver Licensing (GDL) Program:

The GDL Program was introduced in Manitoba in October 1, 2001, and applies to all novice drivers, regardless of age. The novice driver must pass: a written test, a nine-month learning period, a road test, and an intermediate stage, before entering the full licence stage. Certain restrictions apply to the novice driver during the learner and intermediate stages. The intent of the GDL Program is to increase the drivers' privileges as the novice driver demonstrates responsible, violation-free driving behaviours. For a detailed description of the GDL Program refer to Senior 2 Activity 5 Worksheet B.

Impaired Driving:

Impaired driving refers to a conviction under Section 253 (a) of the Criminal Code of Canada. This conviction relates to the operation or care or control of a motor vehicle by a person whose ability to operate the vehicle is impaired by alcohol or a drug. The offence is normally supported by police evidence based on their observation of the person. The evidence normally includes: physical signs such as odour of alcohol, unsteady gait, glassy eyes, etc.

Impulse:

Impulse is the act of a force for a duration of time. For example, impulse equals force multiplied by time. Impulse is equal to a change in momentum.

Inertia:

Inertia is the tendency to maintain a constant velocity.

Momentum:

Momentum is the product of an object's mass and its velocity. Momentum is another measure of the motion of an object.

Newton's Laws:

For an explanation of Newton's Laws refer to *Senior 2 Activity 4 Teacher Background Notes for Physics*.

Refuse Sample:

This refers to a motor vehicle driver refusing to submit to a breathalyzer test. All drivers are required by law to submit to a blood alcohol concentration test when requested (implied consent law).

Risk:

A risk refers to the danger of involvement in a traffic collision.

Risk Behaviours:

Risk behaviours are actions by motor vehicle drivers and other road users that are dangerous. Examples include: riding in a motor vehicle without wearing a seat belt, driving too fast for weather or road conditions, talking on a cell phone while driving a motor vehicle.

Risk Conditions:

Risk conditions are circumstances in the environment that can be dangerous to motor vehicle driving. Examples of risk conditions include: road surfaces (gravel, wet, potholes), winter roads or weather (rain, ice, fog).

Road Risks:

Road risks refer to potentially dangerous conditions and behaviours related to road use. (See definitions of Risk Conditions and Risk Behaviours.)

Uncontrolled Intersection:

This refers to an intersection in Manitoba where there are no traffic signs or signals. Examples include gravel road intersections, exiting a back lane, and many streets.

ASSESSMENT TOOL

