Crash stats

Overview of the unit

In relation to conveying road safety messages to students as prospective drivers and road users, it is vital that students are taught about reading, understanding and interpreting numerical, quantitative and qualitative information.

In this unit students investigate data and statistics related to crashes, and specifically investigate a site in their local area or region and compare it with another site, taking into account the types of crashes and the profiles of those involved in the crashes. With the information gathered, they should then write and produce a pamphlet. The pamphlet should refer to the statistics, research information and expert opinion relating to the likely causes of crashes at the sites (e.g. road conditions, profile of those involved in the crashes, types of vehicles involved, etc).

The activities in this unit build on each other. While it would be possible to do only Activities 1, 2 and 3, Activities 4 and 5 build on the information gathered in the earlier activities.

Purpose

Road safety:

The purpose of this unit is designed to increase student awareness and knowledge of the range of factors and causes relating to casualty and fatality crashes.

VCAL:

This unit helps to develop research, and writing skills. The activities focus on:

- developing research skills
- improving subject specific knowledge
- extracting meaning from written texts related to a specific research question
- communicating ideas clearly and precisely
- communicating information and ideas for a purpose and a specified audience
- presenting information in a written format.

It also aims to develop numerical, statistical and graphical skills, including:

- using and creating tables and graphs to represent, analyse and interpret information
- identifying and using numerical information in texts and materials.

Teacher information

This unit is based around the investigation of road crash statistics and about researching 'hot spots' in areas that the students know. However, the statistics tend to tell similar stories, no matter where they are from.

Students investigate crash statistics using two different websites:

- The **Crash Database** provided by the TAC – the Transport Accident Commission - at its Road Safety website at: www.tacsafety.com.au

  The TAC crash database allows data about people killed and seriously injured on Victorian roads in the past five years to be extracted.

  Users can produce their own reports, tables and charts free of charge, and filter their results by a range of criteria, including date and crash type, as well as by characteristics of people killed and injured in crashes, such as age and gender.

- The VicRoads **CrashStats Database**

  The second excellent database is the CrashStats Database. This site is part of a wide range of information provided by VicRoads on road safety. The best way to access this site is to follow the links to the Road Safety section and then to the *Statistics & research* page from the VicRoads main website at: www.vicroads.vic.gov.au

  Or go straight to the CrashStats site at: http://crashstat1.roads.vic.gov.au/crashstats/crash.htm

It is assumed that this unit would be undertaken in conjunction with other units related to road safety, for example *Safely safely* and *What do you think?*

Note: When accessing data of local crashes, teachers need to be mindful that some students may know the people involved in the crashes, particularly in rural areas. This could result in some students becoming upset.

Resource requirements

Unit material

'Young drivers at risk' from *Crash 'n' Burn*

Handout 1: Data around us

Handout 2: Two crash statistics databases

Handout 3: Useful websites

Handout 4: A bit about pamphlets

Handout 5: A guide to writing pamphlets

Worksheet 1: Some raw data

Worksheet 2: CrashStats database questions

Worksheet 3: Research questions and sources of information

Worksheet 4: Research notes

Worksheet 5: Interview questions

Internet sites	Crash Database provided by the TAC: www.tacsafety.com.au The VicRoads CrashStats Database www.vicroads.vic.gov.au and follow the links to the Road Safety section and then to the Statistics and research page from the VicRoads main website or go straight to the CrashStats site at: http://crashstat1.roads.vic.gov.au/crashstats/crash.htm See also Handout 1: Useful websites.
People	Possible people to be interviewed include a Police Officer (contact the Youth Resource Officer).
Facilities & equipment	A video projector or a computer lab with access to the Internet. If interviews are conducted, it would be preferable to have an audio tape recorder to record the interview.

Alignment of the unit to VCAL

VCAL units

Personal Development Skills Unit 2

Reading and Writing

Numeracy

VCAL unit levels

Activities in this unit are predominately focused at **Senior** level. With appropriate support some tasks could be used with students working at the Intermediate level.

Learning outcomes

Activity	Units and learning outcomes
1. Using statistics	**Numeracy Skills Senior:** 4. Numeracy for Interpreting Society – data: Can create, use and interpret tables and graphs, and calculate and use averages, in order to reflect on information of relevance to self, work or community 5. Numeracy for Interpreting Society – Numerical Information: Can use, and calculate with, fractions, percentages, decimals, rates and large numbers to reflect on aspects of personal, work or community life
2. Crash statistics	**Reading and Writing Skills Senior:** 7. Reading for Knowledge: Demonstrate that meaning has been gained from reading a complex, sustained report, explanatory, expository or informative text **Numeracy Skills Senior:** 4. Numeracy for Interpreting Society – data: Can create, use and interpret tables and graphs, and calculate and use averages, in order to reflect on information of relevance to self, work or community 5. Numeracy for Interpreting Society – Numerical Information: Can use, and calculate with, fractions, percentages, decimals, rates and large numbers to reflect on aspects of personal, work or community life

3. Local hot spot	**Reading and Writing Skills Senior:** 7. Reading for Knowledge: Demonstrate that meaning has been gained from reading a complex, sustained report, explanatory, expository or informative text **Numeracy Skills Senior:** 4. Numeracy for Interpreting Society – data: Can create, use and interpret tables and graphs, and calculate and use averages, in order to reflect on information of relevance to self, work or community 5. Numeracy for Interpreting Society – Numerical Information: Can use, and calculate with, fractions, percentages, decimals, rates and large numbers to reflect on aspects of personal, work or community life
4. Not just numbers	**Reading and Writing Skills Senior:** 7. Reading for Knowledge: Demonstrate that meaning has been gained from reading a complex, sustained report, explanatory, expository or informative text **Numeracy Skills Senior:** 5. Numeracy for Interpreting Society – Numerical Information: Can use, and calculate with, fractions, percentages, decimals, rates and large numbers to reflect on aspects of personal, work or community life
5. Prepare a pamphlet	**Personal Development Skills Senior Unit 2:** 5. Present and communicate ideas and information relating to the complex community project (covers all elements when combined with the research undertaken in the previous activities) **Reading and Writing Skills Senior:** 3. Writing for Knowledge: Write a complex report, explanatory or expository text **Numeracy Skills Senior:** 4. Numeracy for Interpreting Society – data: Can create, use and interpret tables and graphs, and calculate and use averages, in order to reflect on information of relevance to self, work or community

Please note: The activities **support** the learning outcomes listed but may not cover all the assessment criteria/elements. Please check the relevant Curriculum Planning Guide to ensure all assessment criteria/elements are covered. For assessment purposes, in the Personal Development Skills, Reading and Writing and Work Related Skills Units, all the elements of a learning outcome must be covered in the one assessment task. Where an activity doesn't cover all the elements, the activity can be used to build the student's portfolio of evidence.

Assessment

The activities in this unit have been designed as learning activities. However, documentation can be used to build a portfolio of evidence to be used for the assessment of relevant learning outcomes. Evidence may include:

- teacher checklist and observation
- student research notes and report
- copies of student materials and worksheets
- student notes
- interview notes
- information pamphlet.

Sample assessment record sheet

See next page.

Sample assessment record sheet: Senior

Unit name: Crash Stats **VCAL Level: Senior**

Student name: …… Form/Group: ……

Unit Outline: In this unit students investigate data and statistics related to crashes, and specifically investigate a location or site in their local area or region and compare it with another site, taking into account the types of crashes and the profiles of those involved in the crashes. With the information gathered, they write and produce a pamphlet. The pamphlet uses the statistics, research information along with any expert opinion they received relating to the likely causes of crashes at the sites (e.g. road conditions, profile of those involved in the crashes, types of vehicles involved, etc). The focus of the activity is to:

- develop research skills
- improve subject specific knowledge
- extract meaning from written texts related to a specific research question
- communicate ideas clearly and precisely
- communicate information and ideas for a purpose and a specified audience
- present information in a written format
- use and create tables and graphs to represent, analyse and interpret information
- identify and use numerical information in texts and materials.

Learning outcomes and performance:

Activity	Learning Outcomes	Performance	Evidence/comments
1. Using statistics	**Numeracy Skills Senior:** 4. Numeracy for Interpreting Society – data: Can create use, and interpret tables and graphs, and calculate and use averages, in order to reflect on information of relevance to self, work or community 5. Numeracy for Interpreting Society – Numerical Information: Can use, and calculate with, fractions, percentages, decimals, rates and large numbers to reflect on aspects of personal, work or community life		

2. Crash statistics	**Reading and Writing Skills Senior:** 7. Reading for Knowledge: Demonstrate that meaning has been gained from reading a complex, sustained report, explanatory, expository or informative text **Numeracy Skills Senior:** 4. Numeracy for Interpreting Society – data: Can create use, and interpret tables and graphs, and calculate and use averages, in order to reflect on information of relevance to self, work or community 5. Numeracy for Interpreting Society – Numerical Information: Can use, and calculate with, fractions, percentages, decimals, rates and large numbers to reflect on aspects of personal, work or community life		
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4. Not just numbers	**Reading and Writing Skills Senior:** 7. Reading for Knowledge: Demonstrate that meaning has been gained from reading a complex, sustained report, explanatory, expository or informative text **Numeracy Skills Senior:** 5. Numeracy for Interpreting Society – Numerical Information: Can use, and calculate with, fractions, percentages, decimals, rates and large numbers to reflect on aspects of personal, work or community life		
5. Prepare a pamphlet	**Personal Development Skills Senior Unit 2:** 5. Present and communicate ideas and information relating to the complex community project (covers all elements when combined with the research undertaken in the previous activities) **Reading and Writing Skills Senior:** 3. Writing for Knowledge: Write a complex report, explanatory or expository text **Numeracy Skills Senior:** 4. Numeracy for Interpreting Society – data: Can create, use and interpret tables and graphs, and calculate and use averages, in order to reflect on information of relevance to self, work or community		

Unit performance codes: Y = Yet to do; NYC = Not yet completed; CS = Completed satisfactorily

Teacher's signature: ..... Date: .....

Evidence of successful completion of the unit could include:

- teacher checklist and observation
- student documentation of planning and organising of seminar
- the timeline
- materials produced as part of tasks undertaken
- advertising materials
- photos or video of the seminar
- final report.

Activity 1: Using statistics

Introduction

In our society we are constantly presented with numerical and statistical information, particularly at work and in the media. It's vital that we can not only understand the numerical and statistical information we are presented with, but that we can also interpret and reflect on explicit and implicit messages embedded within texts. To NOT understand, interpret and reflect on numerical and statistical information prevents people from engaging with, and participating fully in, society.

In relation to road safety campaigns, the information presented is often statistical and numerical – statistics and information about car crashes, about rates of fatalities and injuries for different age groups, the types of crashes and where and when they occur, the influence of alcohol and drugs on crash rates, and so on are all based on an understanding of data and their related graphs, charts and measures such as averages. If young people do not have the numerical and critical thinking skills to understand, interpret and reflect on the information, then the messages will not have the intended impact.

This and the following activity aim to develop students' numeracy skills to help them to better understand numerical and statistical information with which we are constantly bombarded in our society.

What to do

This activity looks at data, graphs and charts about crashes and investigates the role they play in presenting and analysing data.

The first part of the Unit is about making sure students can create, read and recognise information, statistics and data in terms of numbers, tables, graphs and charts that are about driving, and particularly about crashes and road related casualties and fatalities. As the teacher you will need to:

- Introduce the Unit by explaining that students will be investigating data and statistics related to car crashes and road safety, and specifically investigating a site in their local area or region and, using the information they gather, they will write and produce a pamphlet.
- Explain that students will look at how important numbers and statistics are in relation to the road toll and car crashes. Look at questions such as:
  - What role do numbers and statistics play in analysing the road toll and car crashes?
  - What is the benefit of research into the road toll and crashes?
  - How do we collect, record and analyse data and statistics?
- Collect examples of data and graphs related to road crashes. Newspapers, pamphlets and websites are all good sources of such information. The two key road safety agencies have a range of material including downloadable pdf files
  - VicRoads website: www.vicroads.vic.gov.au
  - TAC (Transport Accident Commission) at its Road Safety website at: www.tacsafety.com.au

  Some examples are included in *Handout 1*: *Data around us*.
- Present the data and graphs you have collected and hand them out to students. Facilitate and stimulate a discussion about data and statistics, asking questions to gather the information you need.

Try to make sure you bring out information about:

- the different types of graphs
- why we use graphs (get them to describe what a particular graph is saying – they could work in small groups with a different graph each and they need to report back about what the graph is saying)
- how we compare information and look for particular characteristics (maximums and minimums, trends and changes, etc.)
- how we might use summary statistics like averages (and talk about the different sorts of averages you can use) and measures of spread, if applicable.

This discussion will indicate how much teaching of these skills you will need to undertake.

- There are some basic properties of graphs you need to reinforce and point out to students, especially if you want them to plot graphs on graph paper, or get them to use computer software. Basics include: what goes where – the vertical and horizontal axes, how to work out the scale to use on the axes, and making sure they label the graph.
- The importance of the use of percentages and rates in order to compare data should also be introduced and highlighted here. There is very little statistical analysis that doesn't require the use of percentages and the understanding of comparisons based either on percentages or relative fractions or rates.
- In relation to averages explain that when we think of average, we think of a 'typical' or 'expected' value or the value 'somewhere in the middle'. There are many good examples about cars and roads where averages are used, such as average petrol prices. Explain and demonstrate that there are three ways we calculate an 'average': the mean, the median and the mode. Show the differences between the three – working out average car prices for example, using mainly 'normal' car prices but also including an extreme price, such as for a Lamborghini car. This will soon demonstrate the difference between the mean and the median.

  Have available supporting teaching activities, materials and worksheets for the students to use when needed.

- To finish you could use *Worksheet 2: Some raw data*. Ask students to analyse the data and plot some graphs, work out averages, do some comparison using percentages and rates etc. Some possible questions are posed on the worksheet.

Use of computer software programs

Computer software programs are very useful for plotting graphs of data. Common word processing packages can easily create graphs, e.g., the Chart program in *MS Word*®, as can most spreadsheet software packages, such as *MS Excel*® with its Chart Wizard. These are relatively easy to use, especially if students know how to use computers.

Point out or demonstrate to students that there are two main stages to using spreadsheets or word processors to plot graphs:

- firstly, you need to enter the data
- secondly, create the graphs.

Student role and responsibilities in relation to the activities

Contribute to small group work and class discussions.

Complete activities and worksheets about data and graphs.

Identify possible sources of information.

Work with others, if appropriate.

Level of teacher support

Facilitate discussion.

Model statistical analysis and interpretation.

Introduce tasks and activities to teach or reinforce statistical and graphical skills and understanding.

Provide advice on how to research and identify sources of information, as required.

Key questions

What role do numbers and statistics play in analysing road tolls and car crashes?

What is the benefit of research into the road toll and crashes?

How do we collect, record and analyse data and statistics?

Extension activity

Ask students to survey others on their beliefs about who is involved in more casualty crashes and why. The results could be incorporated into their written and/or oral report (see Activities 2 and 3).

Assessment

This is a learning activity. To use it as an assessment task you would need to collect evidence such as:

- teacher checklist
- copies of student materials and worksheets
- student notes.

Students working at the Senior level should work relatively independently in undertaking most tasks and activities, although modelling of the tasks would still be expected. At the Senior Advanced level a higher level of independence would be expected along with a greater degree of statistical analysis of the results and the outcomes and conclusions from the data.

The activity could also be used at Intermediate level but at this level, students would require more support and guidance, data would be simpler, and students would not be required to calculate averages.

Activity 2: Crash statistics

What to do

- Introduce to students that most states and territories of Australia collect a wide range of information about crashes and the road toll. Ask them, based on their own knowledge and from some of the information presented in the first activity, what factors do they think impact on road crashes? Give some examples to start the ball rolling. Factors could include:
  - the age of the driver: whether they are young or old
  - the speed the vehicle was travelling at
  - whether the driver was affected by alcohol or drugs
  - the gender of the driver: are they male or female
  - whether fatigue or tiredness was a factor
  - type and size etc. of vehicle
  - type of road user: driver, passenger, motorcyclist, bicyclist, pedestrian
  - the time of the day or the week
  - the location: an intersection, an open road, in the city or in the country, etc
  - the use of seatbelts.
- Tell students that they are going to investigate crash statistics using two different websites. Demonstrate, using a video projector or in a computer lab with access to the Internet, the two websites with databases of road crash statistics that will provide them with lots of data that they can search by themselves and analyse. These are:
  - The **Crash Database** provided by the TAC (Transport Accident Commission) at its Road Safety website at: www.tacsafety.com.au
  - The VicRoads' **CrashStats Database.** This site is part of a wide range of information provided by VicRoads on road safety. The CrashStats site is at: http://crashstat1.roads.vic.gov.au/crashstats/crash.htm
- Introduce some of the road safety language and terminology they will meet when they use these databases. Terms that will need explanation include: fatality, casualty, road user, crash type, ready-made query, build your own query, etc.
- Also remember to introduce the language of graphs and charts that they will also meet as they use these websites. These should have been introduced in the first activity, and include: pie chart, line chart, vertical scale, horizontal scale, variables, etc.
- *Handout 2: Two Crash Statistics databases* has some background information about these two websites. The handout can be used to help you become familiar with the site and/or as a handout for students to support them when they start using the sites.
- In this Activity, get students to work with the TAC Crash Database to analyse the data in terms of general factors. Get students to familiarise themselves with the database and to create both graphs and tables using the data. There will need to be a time of trial and error, as the data available is complex and sometimes it is important to simplify the information being requested. Students will use the second database, the VicRoads' CrashStats Database, in Activity 3.
- You could pose a simple question to start with. For example, what was the number of road fatalities by gender in 20010 Or, how many 18 to 20 year olds were killed in 2010 and 2011? Then ask them to create graphs for this data – if they cannot print off the results, make sure you show them how to save and download their results. Two formats are available – pdf or rtf version. The advantage of rtf is that the file will open in *MS Word®* and students will be able to manipulate the graphs more easily and incorporate them into later reports in *MS Word®* or *MS PowerPoint®*.

- Ask students to analyse the data in terms of some general factors. They could, for example, analyse the data in terms of:
  - age
  - gender
  - day of the week
  - periods of time (months, years)
  - hour of the day
  - injury severity
  - or some combinations of the above.
- Although the data does not provide information on the cause of crashes, get students to think about the *why* of crashes. Questions such as:
  - who is more likely to be involved in a casualty crash?
  - why are they more likely to be involved in a casualty crash?
  - what other factors impact on a person's chances of having a crash?
  - what campaigns are conducted about road safety? what and who do they target? why? does the data support the campaigns?
  - you could suggest students research further about road safety campaigns and information and include the research in their reports.
- Ask students to analyse and write a report on the data they collect and download. Ask them to:
  - include a graph or graphs to show any information, trends and changes
  - consider if there were any major trends or changes in the data? Or were there no trends or patterns?
  - analyse the data and write a report about any key factors, changes and comparisons between different groups or factors.
- If it hasn't come up in the student's own analyses of the data, highlight the areas where age is a key factor. There are many statistics that show how young people are much more likely to be involved in casualty crashes. A range of information and a number of graphs are available from the VicRoads and the TAC websites that demonstrate how young people are over represented in crashes, and that factors such as inexperience, drink driving, poor driving records and speeding, mobile phone use, poor vehicle safety, late night driving and multiple passengers all impact on the safety of young drivers. This would be an ideal summing up to the Activity. It could be done in conjunction with students giving reports back to the class about their own research.

Student role and responsibilities in relation to the activities

Undertake agreed tasks.

Undertake research and collecting data.

Complete activities about data and graphs.

Identify other possible sources of information.

Complete a research project including the use of statistical tools.

Seek teacher assistance when other avenues of assistance are exhausted.

Level of teacher support

Facilitate discussion.

Provide encouragement.

Introduce tasks and activities to teach or reinforce statistical and graphical skills and understanding.

Provide advice and model how to use the databases and use of software to produce graphs.

Provide advice on how to research and identify sources of information, as required.

Key questions

What factors impact on road crashes?

Who is more likely to be involved in a casualty crash?

Why are they more likely to be involved in a casualty crash?

What is the benefit of research?

Assessment

This is a learning activity. To use it as an assessment task you would need to collect evidence such as:

- teacher checklist
- copies of student materials and worksheets
- research notes and report.

Students working at the Senior level should work relatively independently in undertaking most tasks and activities, although modelling of the tasks would still be expected. At the Senior Advanced level a higher level of independence would be expected along with a greater degree of statistical analysis of the results and the outcomes and conclusions from the data.

The activity could also be used at Intermediate level but at this level, students would require more support and guidance, data would need to be simpler, and students would not be required to calculate averages.

Activity 3: Local hot spot

What to do

In this activity students are to use the second crash statistics database, the VicRoads **CrashStats Database.** The CrashStats site is at: http://crashstat1.roads.vic.gov.au/crashstats/crash.htm

- Students are to use the data on this website to specifically investigate a site in their local area or region to analyse it and compare it with another site. They are to take into account the location(s) being studied, the types of crashes and the profiles of those involved in the crashes. With the information they gather, they will write and produce a pamphlet in the following activities. The pamphlet should refer to the statistics, research information and expert opinion relating to the likely causes of crashes at the sites (e.g. road conditions, profile of those involved in the crashes, types of vehicles involved, etc).
- *Handout 2: Two Crash Statistics databases* has some basic background information about the VicRoads CrashStats database. The handout can be used to help you become familiar with the site and/or as a handout for students to support them when they begin to use the site. There is a comprehensive *CrashStats User Guide* that which can be downloaded that details how to use the site.
- Again, demonstrate the use of the database using a video projector or in a computer lab with access to the Internet. Get students to familiarise themselves with the database and to collect and download some graphs and data. There will need to be a time of trial and error, as the data available is complex and sometimes it will be important to simplify the information being requested.
- As in Activity 2 you could pose a simple question or two to start with. For example,
  - What was the total number of road casualties in your local town, municipality or region in the last 12 months? How does this compare with the previous year?
  - What types of crashes were there? Students can look at whether crashes are casualty or fatality crashes, weekend or week day crashes, or if the crash involved losing control, hitting a fixed object, a rear end crash, on a wet road, or at night time.
  - Which crashes were the most common?
  - Did any crashes involve falling from a moving vehicle?
  - Were there any fatalities in that same area?

  Then ask students to create graphs for this data – if they cannot print off the results there and then, make sure you show them how to save and download their results.
- After you feel students are familiar with the databases, have students work in pairs or small groups to pose some questions they want to research about crashes in their area. They need to confirm with you what they are going to research before they proceed. Use *Worksheet 1: CrashStats database questions* to get them to write down their research questions and what they are trying to collect data about.
- Ask students to use their questions to search the database and to then analyse and write a report on the data they collect and download. Ask them:
  - to include a graph or graphs to show any information, trends and changes
  - did they find any key facts or major trends or changes in the data?
  - were they surprised by any factors or information in the data?
  - to analyse the data and write a report about the site they chose and what the statistics are telling them about the location. Include any key factors and comparisons between different groups or factors.

- Also get students to think about the *why?* of crashes and see if they can collect data about this. Questions such as:
  - Who was more likely to be involved in a crash at this site?
  - What types of crashes were most common?
  - What other factors were significant about crashes at this site?

Student role and responsibilities in relation to the activities

Undertake research and collect data.

Complete activities about data and graphs.

Identify other possible sources of information.

Complete a research project including the use of statistical tools.

Work in teams.

Seek teacher assistance when other avenues of assistance are exhausted.

Level of teacher support

Facilitate discussion.

Provide encouragement.

Introduce tasks and activities to teach or reinforce statistical and graphical skills and understanding.

Provide advice and model how to use the databases and use of software to produce graphs.

Provide advice on how to research and identify sources of information, as required.

Key questions

What factors impact on road crashes at a particular location?

Why does one particular area have a higher crash rate?

What is the benefit of research?

Assessment

This is a learning activity. To use it as an assessment task you would need to collect evidence such as:

- teacher checklist
- copies of student materials and worksheets
- research notes and report.

Students working at the Senior level should work relatively independently in undertaking most tasks and activities, although modelling of the tasks would still be expected. At the Senior Advanced level a higher level of independence would be expected along with a greater degree of statistical analysis of the results and the outcomes and conclusions from the data.

The activity could also be used at Intermediate level but at this level, students would require more support and guidance, data would need to be simpler, and students would not be required to calculate averages.

Activity 4: Not just numbers

What to do

In Activity 3 students will have identified one or two crash sites and developed a profile of who was involved in the crashes. In this activity students undertake research to identify why crashes occur at these sites and, in relation to who is involved in the crashes, factors that contribute to the involvement of those groups.

The students need to be clear about what they will research and the possible sources of information. *Handout 2: Useful websites* lists a number of websites that students may find useful in their research. However, the research should also include the school and/or local library as well as local 'experts' (e.g. Police). Students may like to use *Worksheet 3* to help them clarify what they want to know and where they are likely to get information.

For students who are not experienced at reading for information, it may be useful to talk to them about the use of different reading strategies for different purposes, e.g. predicting meaning, skimming, scanning, reading for detail, etc.

If students are unused to taking notes from written texts, they may like to use *Worksheet 4*. This will help them to focus on the information they are looking for.

Before interviewing local 'experts', students should write down the questions they wish to ask. This will help to ensure that they leave the interview with the required information. It will create a good impression – the students will appear organised and professional. Students may like to use *Worksheet 5* to write their interview questions.

When the research is complete, students should discuss their findings in class and talk about any difficulties they experienced in gathering the information.

Students working at Senior level should work more independently and show leadership skills in class discussion and in undertaking research. Students working at Senior level would also be expected to check a greater number of sources of information.

Student role and responsibilities in relation to the activities

Contribute to class discussions.

Identify possible sources of information.

Undertake research on a specific topic.

Work with others, if appropriate.

Level of teacher support

Facilitate discussion.

Provide encouragement.

Model research behaviour, if appropriate.

Provide advice on how to research and identify sources of information, as required.

Key questions

How can information be located?

What is the benefit of research?

What counts as research?

Are information and facts objective?

When are different reading strategies used?

Extension activity

Students should be introduced to the concept that facts can appear to be contradictory. An example of contradictory data should be provided and students given the opportunity to explore why it appears to be contradictory, how interests and values are portrayed and how, and if, the 'truth' can be identified. Discussion of this is likely to have occurred in Activity 1 in the Unit, *Safely, safely*.

Assessment

This is a learning activity. To use it as an assessment task you would need to collect evidence such as:

- teacher checklist
- research notes
- interview notes.

Activity 5: Prepare a pamphlet

What to do

In this activity students use the research material collected in the previous three activities (Activities 2, 3 and 4) to write and prepare a pamphlet (A4 folded to 3 panels which would fit in a DL envelope) which presents information. Students may work individually or in small groups to write and prepare the pamphlet.

Begin the activity by providing students with examples of pamphlets that present information. Discuss the:

- purpose of these type of pamphlets
- who they are written for.

Ask students which pamphlets appeal to them and why. This should lead to a discussion about the layout of information pamphlets and how information is presented. This might include discussion about:

- the type of information presented in each panel
- how much information is included (too much text can make the pamphlet look boring and is less likely to be read)
- how the information is presented (e.g. in paragraphs or dot points)
- how white space is used
- how graphics are used and the types of graphics used
- how colour is used
- the use of headings, fonts and font size.

There is considerable variety in information pamphlets but *Handout 4: A bit about pamphlets* provides some information about how they are often structured and their common features. Ask students to look at the pamphlets provided and decide how they differ from the format suggested in the handout.

Before students begin to develop their own pamphlets, it may also be worth discussing whether the writer of the pamphlets has tried to 'push' an idea and, if so, how they have done this. This raises the question of the purpose of the writer and their objectivity.

Students now need to develop and write their own pamphlets. *Handout 5: A guide to writing pamphlets* provides some guidelines for students. It may be advisable to go through the handout with them before they begin to develop their pamphlets.

After planning the content, students should draft the text and roughly lay it out to gain an idea of how much text is required. Some students may have collected a broad range of information in their research and may need to narrow the purpose so their pamphlet has a clear focus.

When the text has been redrafted, consideration should be given to graphics and layout.

When the pamphlets have been finalised and printed, it may be possible to organise for them to be distributed through the school or community groups.

Students could give an oral presentation using the material presented in the pamphlet.

Student role and responsibilities in relation to the activities

Contribute to class discussions.

Ask for assistance when required.

Develop and write a pamphlet.

Level of teacher support

Facilitate discussion about pamphlets.

Provide encouragement.

Provide examples of information pamphlets.

Provide assistance when requested.

Key questions

What is the purpose of information pamphlets?

Who is likely to read information pamphlets?

Are information pamphlets always objective?

Can information pamphlets influence the reader?

Extension activity

Using the material presented in the pamphlet, students prepare a research report.

Assessment

This is a learning activity. To use it as an assessment task you would need to collect evidence such as:

- a draft of the pamphlet with edits and the final version of the pamphlet.

Handout 1: Data around us

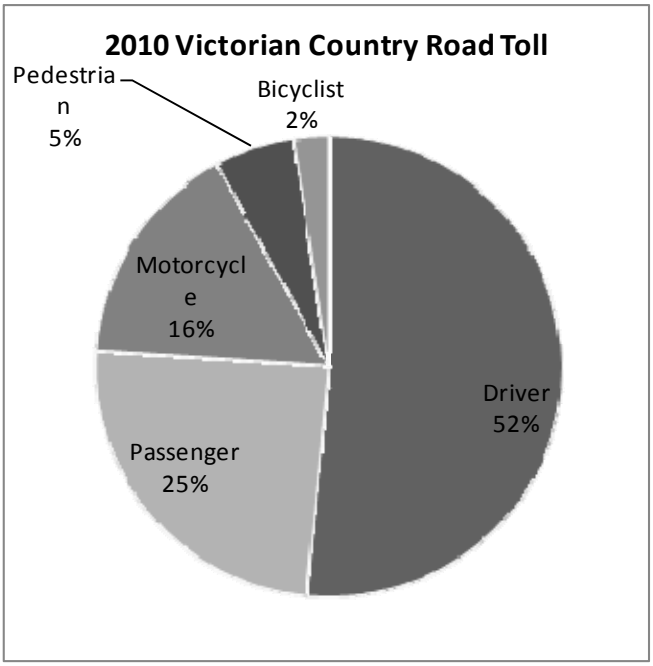
Data and graphs are very useful and are used in many ways. Graphs are an easy and quick way to look at information and to see what is going on, rather than having to read and understand lots and lots of numbers and figures.

You will see graphs in newspapers and magazines, and on leaflets and brochures, and they are often on invoices like phone bills. The most common graphs you see are Pie chart, Bar graphs (also called Column graphs or Histograms), and Line graphs.

A **Pie chart** is a circular chart where values are indicated by the size of the piece or 'slice' of the circle. A Pie chart is very useful for visually comparing different and alternative factors or characteristics of an event.

But note that when the factors being compared are not alternatives and can be chosen more than once, then a Pie chart **cannot** be used (in mathematics, we say the factors being compared need to be mutually exclusive in order to use a Pie chart).

(Data from the TAC's *Crash Database*)

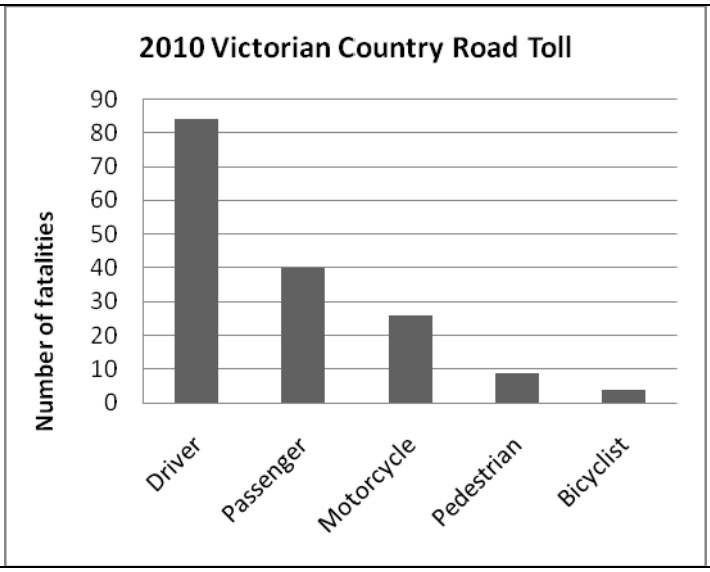


This example compares the different types of fatalities in Victoria's 2010 country road toll.

A **Bar graph** is a graph with tower-like bars representing the value of whatever is being measured, or graphed.

This is an example of a bar graph, and it shows exactly the same information as the above Pie chart.

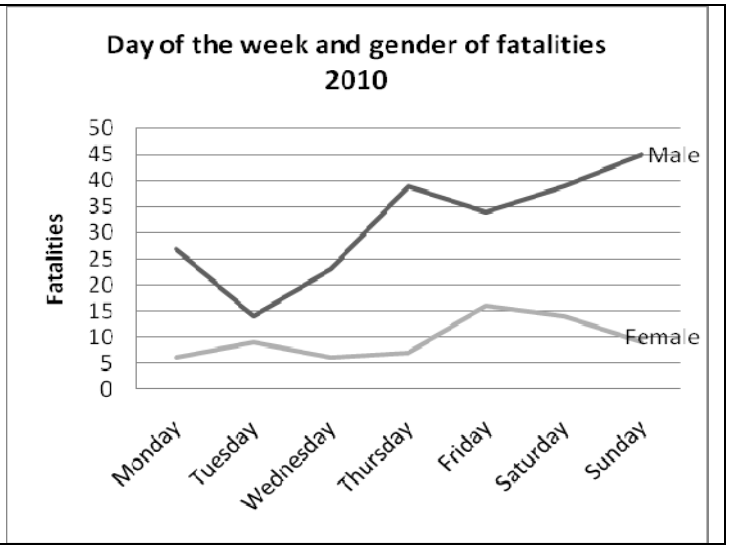
(Data from the TAC's *Crash Database*)



A **Line graph** is a chart with lines joining up the different values, which can be useful to see changes or trends in the data.

This is an example of a line graph that is plotting the 2010 road toll data for the different days of the week for males and females.

(Graph constructed from the TAC's *Crash Database*)



Tables of data

Sometimes when data is collected (called the raw data), it is first organised and put into tables so that the data can be organised for analysis.

Using this data, you can then:

- put it into a graph like on the first page.
- change the data into percentages so that it is more easily compared and analysed.
- analyse the data by working out what are called summary statistics like averages and the spread or range of values.

Here is an example of a table of data.

Road user by age range of fatalities in 2010:

	Bicyclist	Driver	Motorcyclist	Passenger	Pedestrian	TOTAL:
0 to 4	0	0	0	4	1	5
5 to 15	1	0	0	5	2	8
16 to 17	0	2	0	2	1	5
18 to 20	0	19	3	10	1	33
21 to 25	1	17	7	8	4	37
26 to 29	0	18	5	4	2	29
30 to 39	1	17	11	3	2	34
40 to 49	1	14	10	1	9	35
50 to 59	2	16	11	5	1	35
60 to 69	1	10	2	8	2	23
70+	1	17	0	12	14	44
TOTAL:	8	130	49	62	39	288

(Data from the TAC's *Crash Database*)

Handout 2: Two crash statistics databases

There are two databases with comprehensive information about crashes across Victoria. These are:

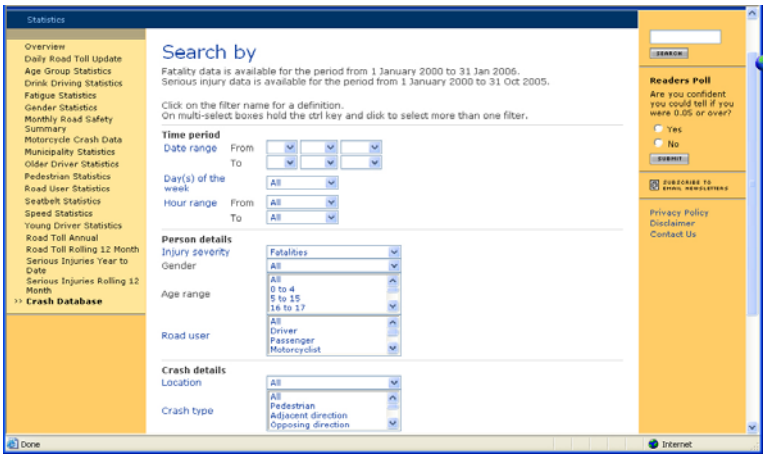
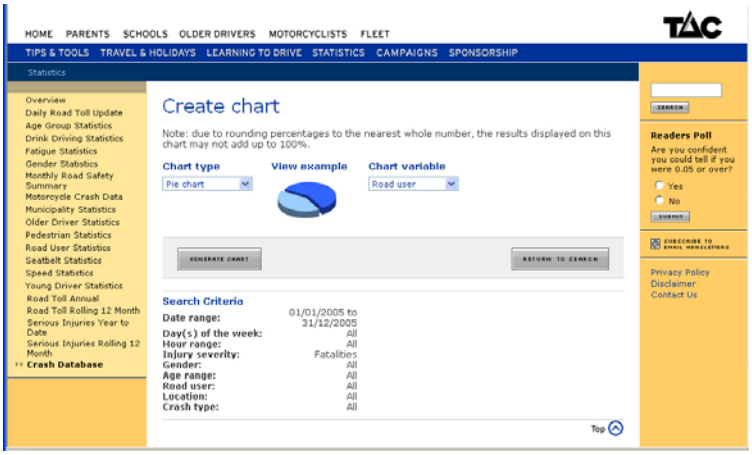
The **Crash Database** provided by the TAC (Transport Accident Commission) at its road safety website at: www.tacsafety.com.au

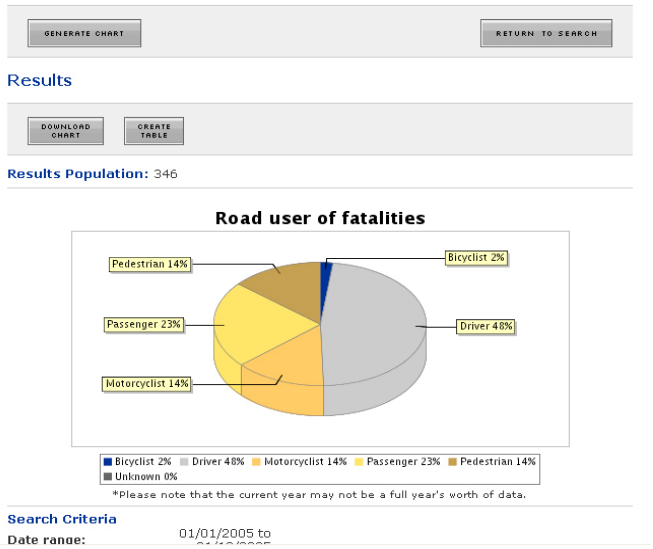
The VicRoads **CrashStats Database.** This site is part of a wide range of information provided by VicRoads on road safety. The CrashStats site is at: http://crashstat1.roads.vic.gov.au/crashstats/crash.htm

Below is some basic information about how to use the databases.

The TAC Crash Database

The TAC crash database allows you to extract data about people killed and seriously injured on Victorian roads in the past five years. You can produce your own reports, tables and charts, and filter your results by a range of criteria, including date and crash type, as well as by characteristics of people killed and injured in crashes, such as age and gender.

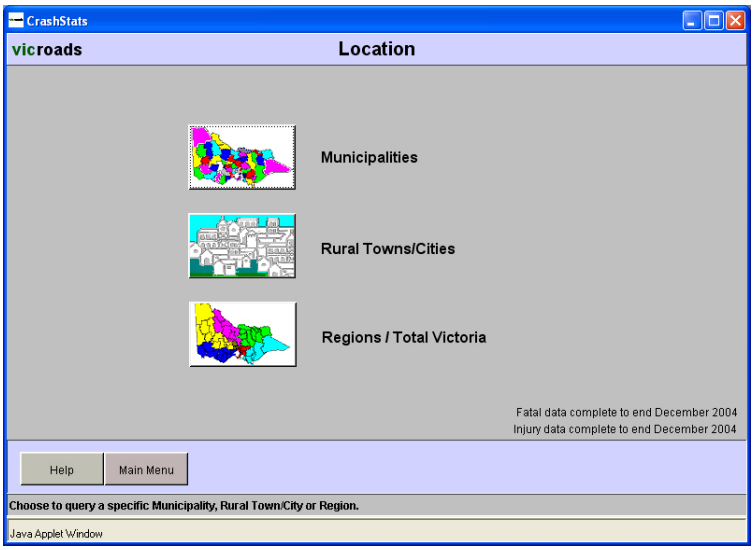
The database allows you to search by the following characteristics: • Time period • Days of the week • Hour of the day • Injury severity • Gender • Age • Road user • Crash location • Crash type.	
Once you have searched and found the information, you have a choice of creating a table or a chart of the data. The chart options are for a either a Pie chart or a Line graph. You can download the graph or the table as a pdf file or as an rtf (Rich text format) file. The latter can be opened with a word processing package such as *MS Word®*.	

Here is an example of the sort of graph you can create and then download.	

The VicRoads CrashStats Database

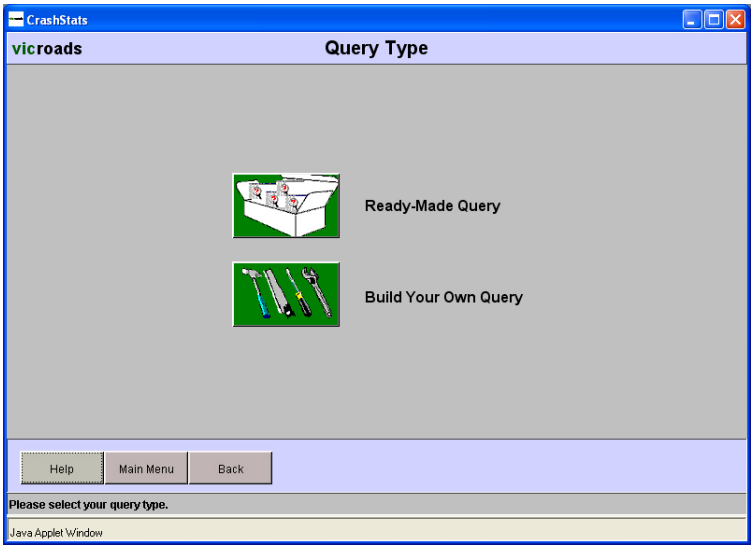
The CrashStats site is part of a wide range of information provided by VicRoads on road safety. The best way to access this site is to follow the links to the Road Safety section and then to the Statistics and research page from the VicRoads main website at: www.vicroads.vic.gov.au . Or you can go straight to the CrashStats site at: http://crashstat1.roads.vic.gov.au/crashstats/crash.htm

There is a comprehensive *CrashStats User Guide* that you can download that details how to use the site.

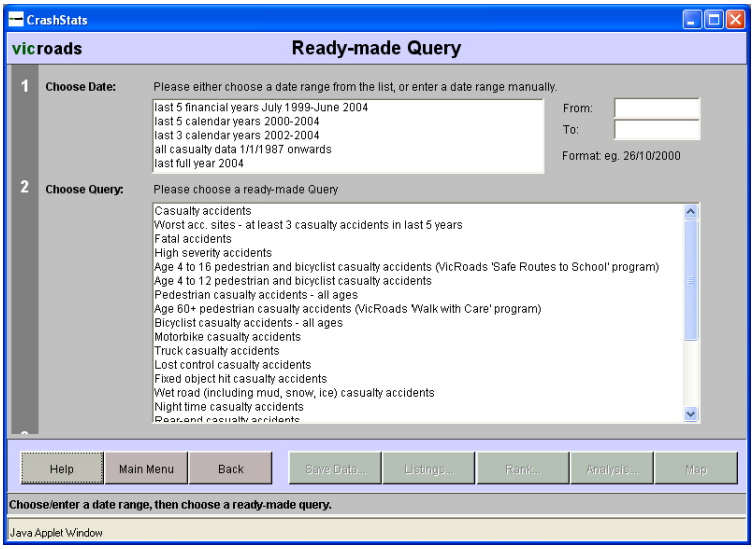
This is the entry screen to the CrashStats database. It first allows you to decide how to find the area, location or region you wish to search. You can search: • for a municipality, rural towns or cities or regions of Victoria • a map to locate particular areas and decide on what types or collections of roads you want to look at and research.	

Once you have chosen your area or location, you need to decide what sort of data and information you are going to research and analyse. You have a choice of a “ready-made query” or you can make up your own search queries via “build your own query”.

You choose the dates you want to find the data for.



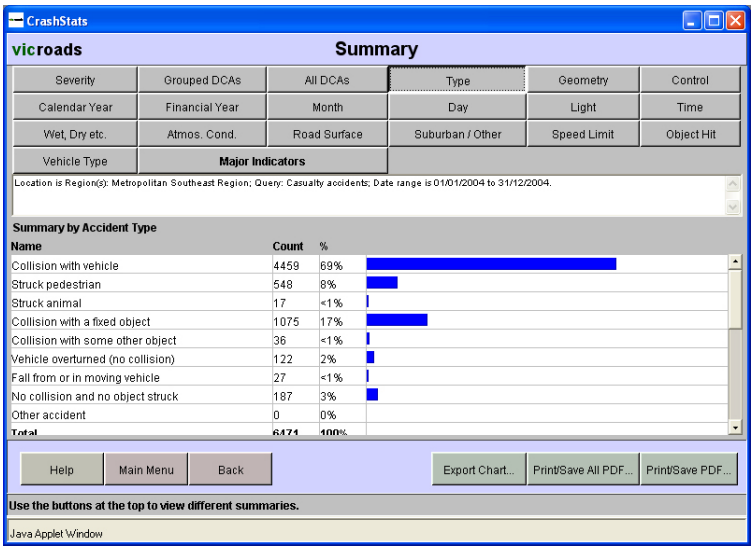
The “ready-made query” section is still very comprehensive and would suit most search requirements.



Once the location and data description has been decided the information can be presented and analysed in a number of different ways.

Here is an example where the selected data has been analysed against the type of crash and presented as a Bar chart.

But there are many options available.



Handout 3: Useful websites

The Crash Database provided by the TAC - www.tacsafety.com.au

The VicRoads CrashStats Database - www.vicroads.vic.gov.au. Follow the links to the Road Safety section and then to the Statistics and research page. Or go straight to the CrashStats site at: http://crashstat1.roads.vic.gov.au/crashstats/crash.htm

Some other worthwhile links about road safety and crash statistics:

Australian Road Assessment Program (AusRAP) - www.ausrap.org/ausrap

AusRAP produces maps showing the risk of road crashes that cause deaths and injuries and rates roads for safety. It highlights improvements that could be made to roads to reduce the likelihood of crashes and decrease serious injuries and fatalities.

National Road Safety Council - www.nrsc.gov.au/

The National Road Safety Council is an independent group of opinion leaders made up of road safety experts and community leaders. The Council's purpose is to drive community discussion and to facilitate road safety initiatives that will assist Australia to move closer to its road safety targets.

Victorian Injury Surveillance Unit (VISU) - www.monash.edu.au/muarc/visu

VISU maintains, analyses, reports on, disseminates and applies injury data to injury prevention, develops countermeasures, implements prevention strategies and monitors trends and outcomes of interventions.

Plus these sites:

- VicRoads: www.vicroads.vic.gov.au
- Transport Accident Commission (TAC): www.tacsafety.com.au
- TAC Drivesmart website: www.drivesmart.vic.gov.au
- Vehicle Road Test Report Directory: www.aaa.asn.au/roadtests
- World Health Organisation: www.who.int/violence_injury_prevention/road_traffic/en

Specific young driver information

- Youthsafe - Road Fatalities and injuries in young people: www.youthsafe.org
- The L-Site: www.lsite.vicroads.vic.gov.au

State Road Authorities

- VicRoads:
  www.vicroads.vic.gov.au
- New South Wales Roads and Maritime Services:
  www.rta.nsw.gov.au
- Queensland Transport
  www.transport.qld.gov.au
- Transport South Australia:
  www.transport.sa.gov.au
- Office of Road Safety Western Australia:
  www.officeofroadsafety.wa.gov.au
- Tasmanian Department of Infrastructure, Energy and Resources:
  www.dier.tas.gov.au
- NT Department of Planning and Infrastructure
  www.nt.gov.au
- Australian Capital Territory Department of Urban Services
  www.tams.act.gov.au
- Land Transport New Zealand
  www.landtransport.govt.nz

Handout 4: A bit about pamphlets

Pamphlets are, generally, produced to:

- persuade the reader (to buy something, to vote for someone, to do something)
- inform the reader.

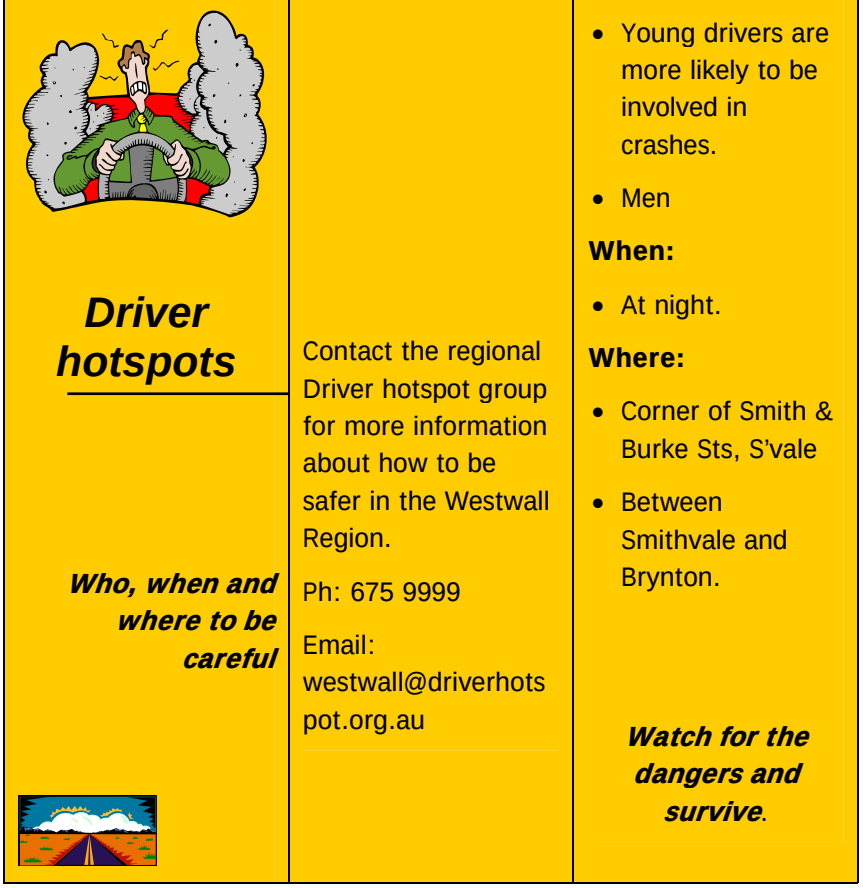
Whether pamphlets are designed to persuade or inform, they have some common features. The mock-up of the pamphlet, *Driver hotspots*, provides information about some common features of pamphlets.

Graphic which relates to the content and captures the reader's attention. Sometimes, blocks of colour are used instead of graphics

Contact details of where to find more information and/or who produced the pamphlet.

Summary of the main points and a recommendation or conclusion

Heading which clearly lets the reader know what the pamphlet is about.



Front panel | Middle outside panel | Panel that folds in

Outside panels

Include main points and some supporting information

Use headings and dot points.

Questions are sometimes used as headings.

Quotes from experts are often included.

Graphics to support text and appeal to audience

General statement about the purpose of the pamphlet

One or two points to support the general statement

Language used is clear and precise.

Main points and some support information.

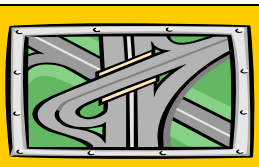
Too many people die and are injured on the roads of Westwall.

Crashes occur because of:

- alcohol & drugs
- inexperience
- speed
- fatigue
- distractions.

When are crashes more likely to occur?

- XXX
- XXX



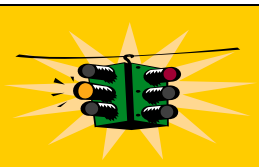
Who's more likely to be involved?

- XXX
- XXX
- XXX

Graph showing who is most likely to be involved in a crash

"Young men take too many risks – it's like they think nothing can hurt them"

Police Inspector Julie James.



Where do most crashes occur in Westwall?

- XXX
- XXX
- XXX

Map showing common crash sites.

Left hand panel | Middle inside panel | Right hand panel

Inside panels

Handout 5: A guide to writing pamphlets

Pamphlets, generally, don't include a lot of information but the information has to be presented clearly and precisely and the layout has to be attractive. You need to think carefully about the pamphlet before you begin to write the text or to lay it out.

Step 1: Who and why

Before you begin, decide:

- why you are producing a pamphlet – what message or information you want to get across to the reader (purpose)
- who you are writing for (audience).

Step 2: What

Think about:

- what information to include to appeal to the audience and to achieve the purpose
- which information will go in each panel – fold a piece of A4 paper into a pamphlet and write what will go in to the different panels.

Step 3: The look

Think about what you would like the final pamphlet to look like.

- will you use photos, diagrams, drawings?
- will there be a lot of text in each panel or only a small amount?

Step 4: Draft the text

Now draft the text for the pamphlet.

- Use headings or questions so the reader can easily see what each section is about.
- Don't worry too much about spelling and punctuation while you are writing the draft. You can fix these later.
- When you have a complete draft, it can be worth laying it out roughly using *MS Word®*. This will give you an indication of whether you have too much or too little text.
- You may find that you have collected too much information and you may need to narrow the purpose so the pamphlet has a clear focus.

Step 5: Edit the text

Now edit the text. You will need to edit it again when you have finished the layout, but it will save you time if you can get the text right at this stage – or close to right.

Step 6: Layout

Now's the time to do the design and lay out the pamphlet.

You can use *MS Word*® to layout the pamphlet, but it is easier to use and move graphics in desktop publishing packages. See which ones you can get access to. Some common ones are *Adobe Pagemaker*® or *InDesign*®, and *MS Publisher*®.

You will need to decide:

- what graphics will appeal to the audience and support the purpose of the pamphlet
    - if you will use photos? Where will you get them from?
    - if it would be better to use a cartoon or line drawing? Who will do them?
    - If you will include tables, diagrams, graphs or maps? Where will you get these from?
- if colour should be used?
    - is there a budget for colour? (always an important point)
    - will colours appeal to the audience? Which ones?
    - does the information lend itself to the use of colour?
    - which colours are appropriate for the content?
- if space (white space) should be left around the text and graphics?
    - what will make the text and graphics stand out more?
    - does the audience like the use of white space?
- the font and the font sizes for the headings and the body of the text.

Step 7: A final edit

Now that you have laid out the pamphlet, you will probably need to do a final edit of the text to check that:

- the text and the graphics support each other
- there isn't too much text (or too little text)
- you are saying what you want – that it meets your purpose
- you have said it in a way that will appeal to the target audience.

Step 8: Publishing

Now that you have finished the pamphlet, talk to your teacher and other students about how you will print and distribute the pamphlet.

Worksheet 1: Some raw data

Here are the road toll figures[1] for the Australian States and Territories since 2005.

Year	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
2005	508	346	330	148	163	51	55	26
2006	496	337	335	117	203	55	46	13
2007	435	332	360	124	235	45	58	14
2008	374	303	328	99	209	39	75	14
2009	463	290	331	119	197	64	31	12
2010	419	288	249	118	193	31	49	18

Use the data to undertake the following tasks and questions.

Some graphs to plot

1. Plot a column graph that compares each State and Territory road toll for 2010.
2. Plot a line graph that compares NSW with Victoria for 2009 and 2010.
3. Plot a graph or a number of graphs showing the road toll for each State and Territory.

Some possible questions to consider

4. Does the data mean that NSW has the worst road toll in Australia? Why? Why not?
5. How does Victoria compare with other states in terms of road fatality rates?
6. What other information do you need to more accurately compare the different States and Territories road toll rates? See if you can find that information and then analyse and compare the different States and Territories.
7. What was the average road toll for each State and Territory for the six years?
8. Using the above graphs and your analysis, write a report on the road tolls across Australia for the years from 2005 to 2010. Comment on any particular trends and differences.

[1] Data from Department of Infrastructure and Transport, July 2011, http://statistics.infrastructure.gov.au

Worksheet 2: CrashStats database questions

You are going to use the VicRoads CrashStats database to analyse some data about an area or location near where you live.

The main aim is to find a local site or area (a stretch of road, an intersection, a local area) where there seems to be a high number of crashes where people were either killed or seriously injured during the last two or three years.

Find out what you can about these crash sites or areas. Use the database to analyse the data and consider all the factors available. Your research has two main parts:

What are the characteristics of crashes at this site or area?

Why do you think crashes happened at these sites?

This Activity is mainly to collect the data to answer question 1. You will then use the data and information collected to research further to see if you can discover reasons why it has a high crash rate.

If you have time and are interested you could compare your local area with similar location in a different region.

In order to help you do this, consider the following questions and get your teacher's feedback before proceeding with the collection of the data.

Team members:

_____

_____

_____

Questions:

1. Where are you going to start? What area or location do you want to research? What time period are you going to research? You may need to refine this if the data that comes up is too small.

_____

_____

_____

_____

_____

2. What information and data are you going to include in your analysis? Examples could include: number of casualty crashes – fatalities and serious injuries at night time; for drivers, passengers, pedestrians, cyclists, motor cyclists, trucks, etc. Check the database to see what possibilities there are.

_____

_____

_____

_____

_____

_____

3. What factors will you focus on in your analysis of the data? Examples could include: severity of casualty crashes; the type of crash; vehicle type; state of the road (wet/dry, road surface); speed limit; the month or day; the time of the day; etc. You need to check the database to see what factors you could include.

_____

_____

_____

_____

_____

_____

4. Do you know how to download the information and charts from the database? Are you ready to proceed with the research?

_____

_____

_____

Worksheet 3: Research questions and sources of information

I would like to know ... E.g. I would like to know why there are so many crashes on the corner of Smith and Burke Streets	**I am likely to find this information at / in / by / from ...** E.g. I am likely to find this information by talking to the local police
1.	
2.	
3.	
4.	
5.	

Worksheet 4: Research notes

Research question: …… ……

……

……

Notes	Where I found the information

You may like to photocopy this sheet for each research question.

Worksheet 5: Interview questions

Purpose of the question	Interview questions

You may like to photocopy this sheet for each question you research