

# Only a little bit over

## Overview of the unit

In this unit students learn about and investigate important road safety issues related to drink driving. It includes looking at the risks and consequences of drinking and driving and the increased chances of having crashes if you drink and drive.

Some of the information dealing with drink driving, such as Blood Alcohol Concentration (BAC) and standard drinks, can be related to mathematics. This unit has activities that look at reading and interpreting the statistics and data about drink driving; about understanding what BAC is and its relationship to driving and penalties; about understanding what a standard drink is and how it relates to common alcoholic drinks. There is also an activity about some of the myths about drink driving and BAC.

## Purpose

### Road safety:

The purpose of this unit is designed to increase student awareness and knowledge of drinking and driving, Blood Alcohol Concentration (BAC) and standard drinks.

### VCAL:

This unit helps to develop numeracy and mathematics skills, along with developing research skills for collecting and presenting information. The activities focus on:

- reading, using and creating tables and graphs to represent, analyse and interpret information
- identifying and using numerical information in texts and materials
- measuring and calculating with metric volumes, decimals and percentages
- developing research skills and using research methods to collect information
- analysing a range of different perspectives and information
- communicating information and ideas for a purpose and a specified audience
- using a variety of techniques for presenting information
- improving subject specific knowledge.

## Teacher information

Although crash rates have improved in recent decades, the number of road deaths is still too high, with alcohol being a key factor. Even with the zero BAC limit applying to learner drivers and probationary licence drivers, alcohol is still a major factor in the road deaths of young people.

Therefore, it is vital to know about and understand the consequences of drinking and driving, along with the laws relating to drink driving.

Some of the information dealing with drink driving, such as BAC and standard drinks, can be related to mathematics. Helping students understand the mathematics behind these important issues can help them appreciate how complex and challenging the issues are.

In all activities related to BAC, it is important to remember that there are no hard and fast rules about how it affects the body. Everyone is different and body size, age, gender and general health are just some of the factors that impact on BAC. These factors also impact on the body's ability to break

down alcohol. Alcohol metabolises via the liver. This process is quite slow and the time taken can vary according to body size, age, gender and general health, etc. Generally the liver takes at least an hour to change the alcohol of one standard drink into energy.

It is assumed that this unit would be undertaken in conjunction with other units related to road safety, for example *Safely, safely* and *Where's the party?*

## Resource requirements

**Unit material**

Handout 1: Facts and statistics about drink driving

Handout 2: Standard drinks

Worksheet 1: Calculating standard drinks

Worksheet 2: Standard drinks or not?

Worksheet 3: A quiz. *What's my poison?*

**People**

Looking After Our Mates is a program that addresses drinking and driving. It is available from your local Victoria Police Youth Resource Officer and some registered local community road safety groups. Contact your Victoria Police Youth Resource Officer via your local police station or visit www.vicroads.vic.gov.au (search for *Victorian Community Road Safety Partnership Program* then go to *Registered groups*) for the list of registered local community road safety groups.

Fit2drive (f2d) is a program for Year 11 students that concentrates on personal safety and responsibility giving them strategies to make them safer on the road. It encourages and empowers young people as road users to look after themselves and their friends. See www.f2d.com.au for more information and to organise a f2d workshop.

**Materials**

Information about alcohol and driving can be accessed from:

- VicRoads website: www.vicroads.vic.gov.au
- RACV website: www.racv.com.au
- TAC website: www.tacsafety.com.au

## Alignment of the unit to VCAL

### VCAL units

Numeracy

Oral Communication

### VCAL level

Activities in this unit are predominately focused at the **Intermediate** level. With appropriate support some tasks could be used with students working at the Foundation level, or they can be extended to also meet the requirements at the Senior level.



### Learning outcomes

| Activity | Units and learning outcomes |
|---|---|
| 1. Drink driving and BAC | **Numeracy Skills Intermediate Unit**<br>5. Numeracy for Interpreting Society – Data: Can use and create everyday tables and graphs to represent and interpret public information which is of interest or relevance.<br>6. Numeracy for Interpreting Society – Numerical Information: Can identify and translate everyday numerical concepts to interpret public information which is in texts of interest or relevance. |
| 2. Standard drinks and alcohol | **Numeracy Skills Intermediate Unit**<br>2. Numeracy for Practical purposes – Measuring: Can use straightforward measurement and the metric system to estimate and measure for the purpose of interpreting, making or purchasing materials in familiar practical situations.<br>6. Numeracy for Interpreting Society – Numerical Information: Can identify and translate everyday numerical concepts to interpret public information which is in texts of interest or relevance. |
| 3. Myths about drinking and BAC | **Oral Communication Skills Intermediate Unit**<br>2. Oracy for knowledge: Use and respond to spoken language in informative talks (elements (a), (b) and (d)).<br>**Numeracy Skills Intermediate Unit**<br>5. Numeracy for Interpreting Society – Data: Can use and create everyday tables and graphs to represent and interpret public information which is of interest or relevance. |

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 checklists and observations of student activities and presentations
- copies of student research notes and reports
- copies of student materials and worksheets
- copies of student presentation materials or files.

## Sample assessment record sheet

See next page.

# Sample assessment record sheet: Intermediate

**Unit name: Only a little bit over** **VCAL Level: Intermediate**

Student name: …… Form/Group: ……

**Unit Outline**: In this unit students learnt about and investigated the important road safety issue of drink driving. Some of the information dealing with drink driving, such as BAC and standard drinks, can be related to mathematics. This unit's activities looked at reading and interpreting statistics and data about drink driving; about understanding what BAC is and its relationship to driving and crashes, especially for young people. It also looked at the fines and penalties for drink driving offences and also about understanding what a standard drink is. The focus of the Unit was to:

- read, use and create tables and graphs to represent, analyse and interpret information
- identify and use numerical information in texts and materials
- measure and calculate with metric volumes, decimals and percentages
- develop research skills and use research methods to collect information
- analyse a range of different perspectives and information
- communicate information and ideas for a purpose and a specified audience
- use a variety of techniques for presenting information
- improve subject specific knowledge.

**Learning outcomes and performance:**

| Activity | Learning Outcomes | Performance | Evidence/comments |
|---|---|---|---|
| 1. Drink driving and BAC | **Numeracy Skills Intermediate Unit**<br>5. Numeracy for Interpreting Society – Data: Can use and create everyday tables and graphs to represent and interpret public information which is of interest or relevance.<br><br>6. Numeracy for Interpreting Society – Numerical Information: Can identify and translate everyday numerical concepts to interpret public information which is in texts of interest or relevance. | | |



| | | | |
|---|---|---|---|
| 2. Standard drinks and alcohol | **Numeracy Skills Intermediate Unit**<br>2. Numeracy for Practical purposes – Measuring: Can use straightforward measurement and the metric system to estimate and measure for the purpose of interpreting, making or purchasing materials in familiar practical situations.<br><br>6. Numeracy for Interpreting Society – Numerical Information: Can identify and translate everyday numerical concepts to interpret public information which is in texts of interest or relevance. | | |
| 3. Myths about drinking and BAC | **Oral Communication Skills Intermediate Unit**<br>2. Oracy for knowledge: Use and respond to spoken language in informative talks (elements (a), (b) and (d)).<br><br>**Numeracy Skills Intermediate Unit**<br>5. Numeracy for Interpreting Society – Data: Can use and create everyday tables and graphs to represent and interpret public information which is of interest or relevance. | | |

**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 checklists and observation
- copies of student research notes and reports
- materials produced as part of tasks undertaken
- copies of student materials and worksheets
- copies of student presentation materials or files.

# Activity 1: Drink driving and BAC

## Introduction

Although crash rates have improved in recent decades, the number of road deaths is still too high, with alcohol being a key factor. Approximately half of 21 to 25 year old drivers killed on Victorian roads are impaired by alcohol. Probationary Licensed drivers are subject to a zero BAC, yet approximately 20% of deaths of drivers aged 18 to 20 involve alcohol.

It is vital to know about and understand the consequences of drinking and driving, along with the laws relating to drink driving.

## What to do

This Activity is about introducing students to the issue of drink driving and making sure they are aware of what it means and how drinking and driving don't go together. Finally it looks at the licensing and financial consequences of drink driving.

As the teacher you will need to introduce the Unit by explaining to students that they will be looking at and learning about BAC and drink driving.

Start with a class discussion about drink driving. Ask and encourage students to contribute their ideas and understanding of issues about drinking and driving. Ask questions such as:

- What are the risks of drinking alcohol and driving?
- Do you think drinking and driving is still a major problem?
- Why do people drink and drive?
- How does alcohol (and other drugs) affect driving ability?
- Is it only drivers who are affected?
- What does BAC stand for?
- P-platers cannot drink and drive. Does this mean young drivers on P-plates are not involved in alcohol related fatal crashes?

After the discussion, have information and pamphlets about drink driving available to handout. Most road and motoring organisations have information about drink driving. Some are available free as downloadable pdf files. Two key state road and safety authorities that have a range of material concerning drink driving, road safety and crash information are VicRoads and the TAC (Transport Accident Commission). The VicRoads website is www.vicroads.vic.gov.au , and the road safety website for the TAC is www.tacsafety.com.au. The Royal Automobile Club of Victoria (RACV) also has material available at www.racv.com.au.

It may be necessary to talk about what tasks and skills driving a motor vehicle involves. Tasks include: visual search and recognition, concentration, information processing, decision-making, coordination, judgement, risk-perception and multitasking. These processes are adversely affected by alcohol. For example, alcohol may lead to inaccurate estimations of distances and a reduction in the field of vision.

The Unit, *Where's the party?* contains activities about driving and intoxication.

Another issue that could be addressed here is the impact and consequences of drink driving – for all people concerned, not just the driver. You could use the activities in the Units *High impact* and *Safely, safely* to support this discussion.



The first mathematics related concept is BAC - Blood Alcohol Concentration. BAC is a measure of how much alcohol is in your blood throughout your body. It is measured in grams per 100 millilitres of blood. The biology and mathematics behind it is complex, and not necessarily of interest here. But it is important to know that this is used to measure how much alcohol is in someone's system and therefore how their ability to drive might be impaired. Look at the range of BAC levels – what degree of impairment is typical at the different levels of BAC? What BAC limits exist in different Australian states and territories, as well as other countries? (Students could undertake research to find this out.) Do other countries measure alcohol limits in the same way that Australia does?

The importance of being able to understand decimal numbers and rates in order to compare BAC levels is a key mathematical concept here. Many VCAL students may not be strong at understanding decimals, so place value knowledge of decimals should be checked and explained here. Having some activities available about comparing, ordering and saying decimal numbers would be a good idea at this point.

Based on the material you have collected, or using the information in *Handout 1*: *Facts and statistics about drink driving*, discuss the drink driving crash statistics. Look at how different BAC levels impact on driving and the crash risk factors. Highlight how young people are still over represented in drink driving crashes, particularly those aged 21 to 25 years.

Another crucial mathematical area is the ability to understand and interpret data and graphs, including percentages. These skills should be introduced and highlighted here. Make sure you use any graphs and associated figures to demonstrate to students how to read and interpret their information and meanings. The graph 'Relative Probability of Crashing at different Blood Alcohol Concentrations' in Handout 1 is an excellent graph to use to show how to read graphs whilst learning an important message.

Have available supporting teaching activities, materials and worksheets. Get the students to work on the materials when needed.

Finally, address the issue of penalties for breaking drink driving laws. Point out that road rules exist to keep our roads safer for everyone. Penalties apply for those caught breaking the rules. They may include monetary fines, demerit points, loss of learner permit or licence or being taken to court. In serious cases prison sentences may be imposed. In Victoria, there are tough penalties for drink driving and even tougher penalties for probationary drivers who drink and drive. You may like to invite students to research what the penalties are.

You could ask students to find out what the penalties (fines, demerit points, loss of licence, court appearance, prison sentence) are for drink driving offences in Victoria. Details are available on the VicRoads website. There may be some activities here that could be used to interpret and calculate with numbers in texts and tables that would cover aspects of two learning outcomes: Numeracy for Personal Organisation – Money and Time, and Numeracy for Interpreting Society – Numerical information.

## Student role and responsibilities in relation to the activities

Contribute to class discussions.

Complete activities and worksheets about numbers, data and graphs.

Identify possible sources of information.

## Level of teacher support

Facilitate discussion.

Introduce any necessary teaching tasks and activities to teach or reinforce numerical, statistical and graphical skills and understanding.

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

## Key questions

What is BAC?

What role does alcohol and drink driving play in the road toll and car crashes?

What are the penalties for drink driving offences?

## Extension activities

Students working at the Senior level could do more detailed research into the statistics and consequences of drink driving, and should work relatively independently in undertaking most tasks and activities, although some support for undertaking the tasks would still be expected.

## 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



# Activity 2: Standard drinks and alcohol

The main aim of this Activity is to learn about standard drinks as a guide to how much alcohol has been consumed. Emphasise that different types of alcoholic drinks contain different amounts of alcohol and it can be hard to know how much alcohol people are drinking. Standard drinks is just a guide because counting drinks is not accurate.

The mathematics behind standard drinks requires understanding about volume and the use of percentages and decimals. There is also, in this case, the use of a formula. So a range of maths skills need to be addressed and taught, including:

- metric volumes, including converting from ml to litres
- multiplying with decimals
- rounding off decimals
- using a simple formula written as a sentence rather than formalised.

Although formulae are not a required part of Intermediate level VCAL, it is not difficult to use and apply and it is good to connect formulae to real life applications. If you have students capable of working at the Senior level this is a good application of algebra to use as an example, and get students to formalise it further.

## What to do

You will need to explain that alcohol is measured in grams and 10 grams of alcohol is equal to one standard drink (which is the same as 12.5 ml in terms of volume). Also that the label on an alcoholic drink container must state the number of standard drinks in the container as well as the amount of alcohol as a percentage (e.g. 2.5%, 40%).

You could start by bringing in to class a number of different (empty) alcoholic drink containers for students to read and analyse. Make a list on the board of their content. Include: the type of drink, the capacity of the container, the alcohol by volume and the number of standard drinks. For example, a 375 ml bottle or can of full strength beer would have marked somewhere on it two values about its alcohol context: 4.9% alcohol and 1.4 standard drinks.

The next discussion and work should focus on the difficulty of keeping tabs on how much you drink and the concept of standard drinks. The idea of standard drinks was introduced to make it easier for people to monitor how much they were drinking and hopefully have more control over their BAC and whether they should drive or not. But it is important to emphasise that Learner and Probationary Licensed drivers cannot drink and drive at all (i.e. zero BAC). Another question here (which they could have already investigated in the section on fines and penalties) is what other drivers, apart from Probationary Licensed drivers, cannot drink and drive at all? Why do they think this is the case?

Talk about how standard drinks are used as a guide to how much alcohol has been consumed. Look at the information on *Handout 2: Standard drinks*. Discuss what the information says and relate this to how BAC can vary from person to person as outlined in Handout 1.

It is important to remember that there are no hard and fast rules about how much alcohol an individual can consume before reaching 0.05 BAC. Everyone is different and body size, age, gender and general health are just some of the factors that impact on BAC. These factors also impact on the body's ability to break down alcohol. Alcohol metabolises via the liver. This process is quite slow and the time taken can vary according to body size, age, gender and general health, etc. Generally the liver takes at least an hour to change the alcohol of one standard drink into energy.

Show students the formula that works out the number of standard drinks in any container if you know the volume and the alcohol content. Do some examples to demonstrate how it works. Then you could give students *Worksheet 1: Calculating standard drinks*.

An exercise or activity for students is to work out how many standard drinks there are in different sized glasses. You could get students to do this at home, and this activity is outlined on *Worksheet 2. Standard drinks or not*. However, this can easily be adapted and conducted in class in small groups. If you do it this way in class, you can extend it somewhat. You need to bring in some different sets of glasses and drink containers (not marked with their volumes) and get students to first of all work in small groups to guess which glass holds the most through to which holds the least – that is put them in order from largest to smallest in terms of volume. They could then be asked to guess or estimate how many ml each one holds. Then using a measuring jug or container, measure how much drink (using water of course) each container holds and see how close students were in both their ordering and the guesses. Using a similar table to the one on Worksheet 2, get the students to use the formula to calculate how many standard drinks each would hold for particular alcoholic drinks.

Following the exercises, highlight to students how difficult it would be, in a social setting, to accurately judge how much alcohol they have been served. Plus, given there is no way of knowing how the alcohol consumed will impact an individual's BAC, there are problems with relying on the standard drink measure to keep under the legal BAC limit.

Discuss with students how difficult it can be, in a social setting, to accurately judge how much alcohol you have been served.

During the discussion, point out that as there is no way of knowing how the alcohol consumed will impact an individual's BAC, there are problems with relying on the standard drink measure to keep under the legal BAC limit.

## Student role and responsibilities in relation to the activities

Undertake agreed tasks and participate in discussions.

Undertake measurements and calculations.

Complete activities and worksheets.

Seek teacher assistance when other avenues of assistance are exhausted.

## Level of teacher support

Facilitate discussion.

Provide encouragement.

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

Provide advice and modelling of 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 checklists
- copies of student materials and worksheets.

Students working at the Senior level should work relatively independently in undertaking most of these tasks and activities, although some modelling of the tasks would still be expected. The use of a formula helps extend this activity to the Senior level, and this could easily be extended further through conversions and calculations with decimals and metrics.

The activity could also be used at Foundation level but at this level, students would require a lot more support and guidance, calculations would need to be simpler, and students would not be expected to use the formula at all.

# Activity 3: Myths about drinking and BAC

This final Activity addresses some of the main concerns and myths about drink driving, and enables you to reinforce some of the important messages about drink driving and alcohol. It has three major parts. One is to undertake a survey of fellow students (or people in their community) about their beliefs and understandings about drink driving. The second part is to invite a speaker to talk about the dangers of drink driving and/or have more activities and information about drink driving and alcohol. The final part finishes with a Quiz about drink driving.

## What to do

### The survey

The first activity is to get students to undertake a survey about what people know about drink driving. Start by having a discussion about what questions they could ask to determine what other students might think and believe about drink driving, especially in light of what they've learnt about drinking and driving in this Unit. Examples could be:

- P-Plate drivers are allowed to drink and then drive provided they wait for one hour after they stop drinking? True or **False**?
- With a zero BAC limit for P-plate drivers, alcohol and drink driving are no longer an important factor in crashes for young people? True or **False**?
- Eating food when you drink keeps you under the BAC limit? True or **False**?
- If you drive with a BAC of 0.1, your chances of having a crash are how many times greater than if you hadn't consumed alcohol? 2 times; 4 times; 6 times or **8 times greater**.
- Drinking coffee helps reduce your BAC? True or **False**?

Once they have decided on their questions they need to develop a questionnaire and answer/response sheet to collect the information. Remind students to restrict the survey to a small number of questions, otherwise the analysis will be too complex. Students could work in pairs or small groups. Different students or groups of students could ask different questions. Make sure they get your approval before starting to use it to collect data. You might like to suggest they trial it first. They need to decide if they want to collect any information about the respondent – like their age, gender, etc.

There are different groups of students or people they could interview. Groups may be people who have left school and are a bit older, or other Years 11 or 12 students who haven't done this Unit, for example, VCE students. It is not recommended that students below Year 11 be interviewed as the topic is not age appropriate.

This is not only a learning opportunity for students conducting the interviews but also those being interviewed. Before concluding each interview, it is important that the correct answers are shared, providing an opportunities for incorrect myths and information to be dispelled.

Students then need to undertake their surveys and collate and analyse the results. The whole class could pool their results to get a larger sample and then have more powerful results. However, students need to consider the implication of one person being surveyed more than once. When they have collected their results they should compile a report with the results, including a graph or graphs of their results, and any conclusions they want to highlight and links to their earlier research on drinking and driving.



Finally, they should prepare an oral presentation to the class. This should be supported by the development of some printed or IT based material – e.g. a poster summarising their written report, a leaflet about the results of their survey, or a presentation using *MS PowerPoint®*. Again, ask them to link their findings from their survey to their earlier research on drinking and driving. They could also be asked in small groups to prepare a summary or handout of their results to give to their invited speakers (if this has been organised for the next part of this Activity). They will need to be made aware of the different audiences – firstly, their peers and other students, and secondly the invited speakers. You may need to discuss the different requirements for the two reports or presentations, preparation for writing them up and for handouts and notes etc.

The main idea in this part of the Activity is to address and dispel some of the myths and misunderstandings about drink driving and BAC. Remedies such as drinking coffee, chewing gum, taking a cold shower, using a breath freshener or other remedies do NOT reduce or hide your BAC. It is important to reiterate that the ONLY way to reduce your BAC is to stop drinking and allow enough time to pass for your body to metabolise the alcohol.

### Organise a workshop or presentation

It would also be a good idea to have the students organise one of the following presentations/ workshops for their class or year level:

- Looking After Our Mates is a program that addresses drinking and driving. It is available from your local Victoria Police Youth Resource Officer and some registered local community road safety groups. Contact your Victoria Police Youth Resource Officer via your local police station or visit www.vicroads.vic.gov.au (search for *Victorian Community Road Safety Partnership Program* then go to *Registered groups*) for the list of registered local community road safety groups
- Fit2drive (f2d) is a program for Year 11 students that concentrates on personal safety and responsibility giving them strategies to make them safer on the road. It encourages and empowers young people as road users to look after themselves and their friends. See www.f2d.com.au for more information and to organise a f2d workshop.

Students should take notes of the most important points raised in the sessions. These will inform their final discussion.

### The quiz - What's my poison?

*Worksheet 3: What's my poison?* is a good activity to use towards the end of this Unit as it allows students to reflect and think about all the information encountered in this Unit.

Finally, use the results from the survey, the information students have gained from the presentation or workshop and the Quiz to talk about and dispel the myths about drink driving and alcohol.

## Student role and responsibilities in relation to the activities

Undertake agreed tasks.

Undertake survey and collect data.

Write or present a report.

Identify other possible sources of information.

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 on how to conduct a survey and identify sources of information, as required.

Provide advice on how to prepare a report and make a presentation, as required.

## Key questions

What do students understand and know about the dangers of drinking and driving?

What are some of the misunderstandings and myths about drinking and driving?

## Assessment

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

- teacher checklist of student activities and presentations
- copies of student materials and worksheets
- research notes and report
- copies of student presentation materials or files.

At the Senior level a higher level of independence would be expected along with a greater degree of complexity in the survey conducted and in the consequent statistical analysis of the results and the outcomes and conclusions from the data.

The activity could also be used at Foundation level but at this level students would require more support and guidance with the survey and with writing up any report – it may be best to get them to report orally about their findings.



# Handout 1: Facts and statistics about drink driving

## Blood Alcohol Concentration (BAC)

Blood Alcohol Concentration (BAC) is a measure of how much alcohol is in the blood in your body. It is measured in grams per 100 millilitres of blood.

Probationary Licensed drivers must have a zero (0.00) BAC. This means they must have no alcohol in their blood. For more experienced drivers out of their Probationary Licence period, a BAC of under 0.05 is legal. Any BAC level 0.05 or higher is not legal and is considered unsafe for driving. At levels above 0.15 or 0.20 it is considered extremely unsafe to be in control of a vehicle and also dangerous to a person's health and well-being.

## How alcohol affects people

Alcohol affects people differently and it can affect the same person differently every time they drink.

Two people who drink the same drinks with the same amounts of alcohol can each have a different Blood Alcohol Concentration (BAC). The reasons for this variation can include:

- body size — a smaller person could have a higher BAC than a larger person
- body fat — a person with a lot of body fat will usually have a higher BAC
- gender — due to physical differences between males and females
- how much food the person has eaten
- the condition and state of the person's liver
- the health of the person.

So the way people respond to alcohol, and therefore their BAC, will vary enormously from individual to individual.

There are **NO** hard and fast rules.

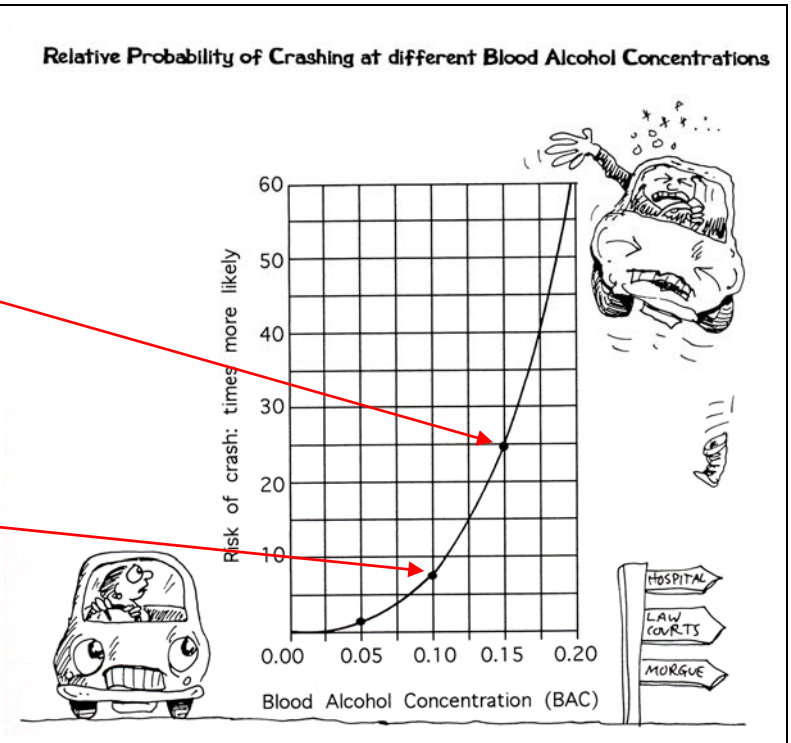
## BAC levels and your chances of having a crash

Below is a graph showing how the chance of crashing increases dramatically as your BAC rises. It is based on comparing how many times more likely you are to have a crash at various levels of BAC compared to zero (0.00) BAC.

How many times more likely are you to have a crash if you have a BAC of 0.20?

At a BAC of 0.15 you are now 25 times more likely to have a crash than if you hadn't drunk.

So, for example, at a BAC of 0.10 you are almost 8 times more likely to have a crash than if you hadn't drunk.






## Some drink driving data and statistics

- A BAC of 0.05 means the risk of having a crash is doubled compared with a driver with zero BAC.
- Alcohol is involved in approximately 20% of deaths for 18 to 20 year old drivers, and 23% of deaths of drivers over 25 years of age.
- Alcohol is involved in 50% of deaths for drivers aged 21 to 25 years.
- Each year, on average, 50 pedestrians are killed on Victoria's roads. Of these, 30% of pedestrians killed are over 0.05.

Young drivers are already at a greater risk of crashing due to inexperience, over confidence and deliberate risk taking.



# Handout 2: Standard drinks

The label on any alcoholic drink container shows the number of standard drinks as well as the amount of alcohol as a percentage. This includes cans and bottles of beer, wine, alcoholic cider, mixed drinks, spirits, casks of wine, etc. It is written in two ways:

- as a percentage of the volume (e.g. 2.5%, 40%)
- in terms of the number of standard drinks in the container.

For example, a 375 ml bottle or can of full strength beer would have marked somewhere on it two values about its alcohol content: 4.8% alcohol and 1.4 standard drinks.

The standard drink measure is used as a guide to help people better understand how much alcohol they have consumed.

Different types of alcoholic drinks contain different amounts of alcohol and it can be hard to know how much alcohol you might be drinking.

Alcohol is measured in grams and 10 grams of pure alcohol is one standard drink. A standard drink always contains the same amount of alcohol regardless of the type of alcohol or the size of the container it is served in.

The following drinks equal 1 standard drink.

| | |
|---|---|
| **Mid strength beer** (3.5 per cent):<br>One can or stubbie = 1 standard drink<br>(Total = 375 ml). |  |
| **Red wine** (13 per cent):<br>One small glass (100 ml) = 1 standard drink<br>Note: A typical serving of wine at a restaurant or bar is 150ml.<br>The line on the glass is a portion control line, and usually shows 150ml, not a standard drink (100 ml of wine). |  |
| **Mixed drinks** (40 per cent):<br>One glass containing (30 ml) spirits plus mixer<br>= 1 standard drink |  |
| **Full strength beer** (4.8 per cent):<br>One pot/middy (285 ml) = 1 standard drink |  |
| **Spirits or liqueurs** (40 per cent):<br>One nip (30 ml) = 1 standard drink |  |

The amount of alcohol in your blood is affected by many factors. This means that a standard drink can affect you differently every time you drink.

## Do you know how much you should drink?

Everyone is different and body size, health and gender are just some of the factors that impact on BAC.

If you choose to drink, the following is a general guide for staying under 0.05 BAC - but not a guarantee. AND remember if you are a Learner driver or on your P-plates you cannot have any alcohol in your system when you drive.

**Men:** No more than **2** standard drinks in the **first hour** and no more than **1** standard drink every hour after that, for a maximum of three hours.

**Women:** No more than **1** standard drink in the **first hour** and no more than **1** every hour after that, for a maximum of three hours.

Because we cannot accurately judge the amount of alcohol we have drunk, there are problems with relying on the standard drink measure to keep under the legal BAC limit.

**Alcohol leaving your body**

Your body breaks down alcohol through your liver. This is a slow process and varies from person to person depending on your body size, health, gender, etc. A rough guide is that your liver will take at least 1 hour to break down a standard drink.



# Over the limit the next day

You could still have alcohol in your system the next day and may well be over the limit.

The table is an example of how long it may take for alcohol to leave a person's system.

| Time | What happens | BAC |
|---|---|---|
| 7.00-11.00pm | They start drinking at 7pm and stop at 11pm. | Will be increasing |
| 11.00pm | They stop drinking. Their BAC will continue to rise. | 0.15 |
| 12.00am (midnight) | It has taken another hour for the alcohol to be fully absorbed into the blood stream. | 0.16 |
| 1.00am | Their BAC then begins to fall. But remember this varies from person to person. | 0.15 |
| 11.00am | Their BAC continues to fall by about 0.01 each hour. At this stage they are still over the legal limit. | 0.05 |
| 4.00pm | Their BAC continues to fall and only by late in the afternoon the next day will it possibly have returned to 0.00. | 0.00 |

So in this case it has taken 17 hours since this person stopped drinking for them to get back to 0.00 BAC. And remember, this is just a guide.

**Nothing** will speed up the process of eliminating alcohol from your body.

Maybe your should rethink driving or using heavy machinery the next day, especially given many of you are learner or probationary drivers on 0.00 BAC.

Even though you may feel and think you are okay to drive, you may still be driving over the legal limit the next day.

## Choices

The safest option is if you are going to drive, don't drink and if you are going to drink, don't drive.

Everybody needs to plan ahead if they intend to drink. If you have said you will be the agreed non-drinker, you much stay alcohol free as well as drug free.

Don't drive if you have been drinking and don't persuade your friends to drive if they have been drinking. AND, don't get into a car with someone you know has been drinking.

# Worksheet 1: Calculating standard drinks

There is a formula that you can use to calculate the number of standard drinks in different drinks. The formula for the calculation is:

Number of standard drinks = Volume of drink in litres[2] x the % of alcohol x 0.789 (the specific gravity of ethanol[3])

**An example:**

375 ml can of mid strength beer at 3.9% alcohol:

Number of standard drinks = Volume of drink in litres x the % of alcohol x 0.789

= 0.375 x 3.9 x 0.789

= 1.1539125

So, 375 ml of mid strength beer at 3.9% alcohol has 1.2 standard drinks (rounding off to the one decimal place).

**Questions:**

Find how many standard drinks there are in each of the following drinks. Round off your answers to the first decimal place.

### 1. A 375 ml can of pre-mix spirits at 7% alcohol

_____

_____

_____

_____

### 2. A 750 ml bottle of champagne at 12.5% alcohol

_____

_____

_____

_____

[2] Remember there are 1000 ml in 1 litre, so to change from millilitres (ml) to litres you need to divide (÷) by 1000. That is, 375 ml = 375 ÷ 1000 = 0.375 litres

[3] Ethanol is the chemical name of pure alcohol.



**3. A 150 ml glass of red wine at 13.5% alcohol**

_____

_____

_____

_____

**4. A mixed drink with a nip (30 ml) of vodka at 40% alcohol**

_____

_____

_____

_____

**5. How many standard drinks would you have if you drank four 285 ml glasses of light beer at 2.2% alcohol?**

_____

_____

_____

_____

**6. How many standard drinks would you have if you drank four 375 ml stubbies of beer at 4.9% alcohol?**

_____

_____

_____

_____

# Worksheet 2. Standard drinks or not?

What you are being served may not be a standard drink.

For example, in restaurants, wine glasses typically have a line to indicate to staff where to fill the wine to. This is not a measure of a standard drink. The line is placed at approximately 150ml, which is about 1.4 to 1.5 standard drinks.

So how do you know how many drinks you have really had?

Try the activity on the next page that gets you to work out how many standard drinks are in some different sized glasses.

**More information**

Accurate and up-to-date information on alcohol and low-risk drinking can be obtained from the following websites:

- Australian Drug Information Network: www.adin.com.au
- Australian Drug Foundation: www.adf.org.au
- National Drug & Alcohol Research Centre: www.ndarc.med.unsw.edu.au

## An activity about non-standard drinks

Find some glasses from home and measure how much they really contain. Then use the formula to work out how many standard drinks they hold.

### What you will need:

- a measuring jug or container measured in ml
- some different sized and shaped drinking glasses - try and find about 4.

### What you need to do:

- pour some water into each glass up to where you think it might be typically filled for drinking
- empty the water into your measuring jug and measure how much it holds
- record the volume in the table



- next, decide what type of drink you would serve in it (choose from light beer, full strength beer and wine)
- use the information to calculate the number of standard drinks the glass holds using the formula for working out standard drinks.

### Complete the table

Use the following alcohol contents for the drinks (but remember that in real life these will vary):

Light beer: 3% Full-strength beer: 5% Wine: 12.5%

Remember the formula to calculate the number of standard drinks is:

**Number of standard drinks = Volume of drink in litres x the % of alcohol x 0.789**

The first one is done as an example for you.

| Type of Glass | Volume it holds | Type of drink and % alcohol | Number of standard drinks |
|---|---|---|---|
| *Example: Beer glass* | *250 ml* | *Full-strength beer: 5%* | *0.250 x 5 x 0.789 = 0.98625 = 1 standard drink* |
| | | | |
| | | | |
| | | | |
| | | | |

### Think about:

How can you tell how much alcohol you have drunk?

Remember, you can never be sure how alcohol will affect you. It will be different each time you drink.

# Worksheet 3: A quiz. *What's my poison?*[4]

In each of the following statements, circle the correct response.

| | |
|---|---|
| 1. There is no point learning about drink driving because I am not going to drink and drive.<br>**True** **False** **Don't know** | 2. One can of beer can put a driver over the limit.<br>**True** **False** **Don't know** |
| 3. As soon as people stop drinking, they immediately begin to sober up.<br>**True** **False** **Don't know** | 4. The alcohol in champagne and other sparkling wines is absorbed faster than that in still wine.<br>**True** **False** **Don't know** |
| 5. Alcoholic drinks are a good source of nutrients.<br>**True** **False** **Don't know** | 6. Drinking alcohol keeps out the cold and maintains body heat.<br>**True** **False** **Don't know** |
| 7. On average, you are four times more likely to have a crash when you have a BAC reading of 0.08 than when you have a 0.00 BAC.<br>**True** **False** **Don't know** | 8. It is easy to tell when a driver's ability to drive safely is affected by alcohol.<br>**True** **False** **Don't know** |
| 9. Everyone reacts exactly the same to the same amount of alcohol.<br>**True** **False** **Don't know** | 10. Even if you don't feel affected by alcohol, alcohol still affects your driving skills.<br>**True** **False** **Don't know** |
| 11. A person can know exactly how much they can drink before they reach 0.05 BAC.<br>**True** **False** **Don't know** | 12. You can beat the breathalyser.<br>**True** **False** **Don't know** |
| 13. Some of the following will help a person who has been drinking to sober up more quickly: exercise; fresh air and deep breathing; a cold shower or swim; a drink of milk; black coffee; vomiting.<br>**True** **False** **Don't know** | 14. The effects of alcohol may be intensified when combined with other drugs.<br>**True** **False** **Don't know** |
| 15. Eating food when you drink guarantees you'll be under 0.05 BAC.<br>**True** **False** **Don't know** | 16. It is legal for 16 year olds to buy alcohol if they have their parent's permission.<br>**True** **False** **Don't know** |

[4] Adapted from Gayle Di Pietro & Olga MacKenzie, *Choices – Alcohol and Road Safety,* VicRoads, Kew, 1994

## Answers to the What's my poison? quiz

| Question | Answer |
|---|---|
| 1. | False |
| 2. | True |
| 3. | False |
| 4. | True |
| 5. | False |
| 6. | False |
| 7. | True |
| 8. | False |
| 9. | False |
| 10. | True |
| 11. | False |
| 12. | False |
| 13. | False |
| 14. | True |
| 15. | False |
| 16. | False |

**Notes:**