



OVERVIEW

BIG IDEA

Alcohol is often thought of as harmless fun, but its effects are often dangerous and even deadly.

OBJECTIVE

3.1 Identify the effects of alcohol on the body in relation to blood alcohol concentration

AGENDA

1. Alcohol Facts
2. Alcohol Terms
3. Effects of Alcohol chart
4. BAC chart

HOMEWORK

Find a graph related to drinking and driving. Print it out to bring in. Then summarize the graph in your own words.

LESSON 3.5

Alcohol

SUMMARY:

This lesson provides students with background information on the effects of alcohol in relation to blood alcohol concentration. Students will begin the lesson by reading a list of statistics on alcohol use among adolescents. Then they will discuss the factors that contribute to drinking and driving. After defining basic alcohol terms, students will examine a chart from the CDC with an overview of the effects of alcohol on the body and answer comprehension questions. Next, they will analyze a BAC Chart, answering additional questions to demonstrate their understanding.



MODULE 3: DRUGS & ADDICTION LESSON 3.5

Alcohol

Obj. 3.5: Identify the effects of alcohol on the body in relation to blood alcohol concentration.

Read the following statistics about alcohol. Circle the ones that surprise you the most.

1. By age 14, 41% of children have had least one alcoholic drink.
2. Over three million teenagers are alcoholics. Several million more have a serious drinking problem that they cannot manage on their own.
3. Every year, an estimated 30,000 college students require medical treatment after overdosing on alcohol.
4. Annually, 400,000 students between the ages 18 and 24 engage in unprotected sex while drunk and say they wouldn't have done it had they been sober.
5. Teens who begin drinking before age 15 are five times more likely to develop alcohol dependence than those who begin drinking at age 21.
6. The three leading causes of death for 15- to 24-year-olds are automobile crashes, homicides and suicides -- alcohol is a leading factor in all three.

*Source: Harvard School of Public Health
Adapted from: <http://www.teamfortcollins.org/resources/parent-of-a-teen/11-facts-about-teens-and-alcohol/>*

Did you know that 1 in 6 people killed on the road are involved in drunk driving accidents? With a partner, discuss the following question and list all factors you can think of below.

What influences people to drink and drive?

Read the basic definitions below:

Alcohol Use: Drinking in moderation, keeping a safe BAC. 1-2 drinks per day.

Alcohol Abuse: Drinking with the purpose of becoming intoxicated, leading to negative consequences.

Alcohol Dependence (Alcoholism): Experiencing withdrawal symptoms when not drinking, develop high tolerance. Drinking is the priority on a daily/weekly basis.

Blood Alcohol Concentration (BAC): The amount of alcohol contained in a person's blood, usually reported as a percentage such as 0.10%, which indicates that one-tenth of a percent of a person's blood is alcohol.

DO NOW: Ask students to reflect upon what surprised or shocked them about these statistics (for example, maybe they thought more teens have tried alcohol, or maybe less). Use this opener to get the conversation going and set the stage for a safe environment, where appropriate, respectful, and considerate conversation is the norm.

DISCUSS: Remind students that this may be a sensitive topic for many in the room, as the prevalence of alcoholism, drunk driving, etc. is so large that likely some of us have been affected.

NEW INFO: Ask students what they already know about blood alcohol concentration (BAC). Ask if they know ways it is tested (breathalyzer in the field—ex: police stop—and blood, breath or urine test in a clinical setting).



Alcohol is a depressant. Because alcohol in the blood travels directly to the brain, cognitive functioning is affected, resulting in increased risk of many kinds of injuries. Most significant among these is the risk of a motor vehicle crash when a person drives with too great a concentration of alcohol in his or her system.

BLOOD ALCOHOL CONCENTRATION (BAC) ¹	TYPICAL EFFECTS	PREDICTABLE EFFECTS ON DRIVING
.02%	<ul style="list-style-type: none"> ▶ Some loss of judgment ▶ Relaxation ▶ Slight body warmth ▶ Altered mood 	<ul style="list-style-type: none"> ▶ Decline in visual functions (rapid tracking of a moving target) ▶ Decline in ability to perform two tasks at the same time (divided attention)
.05%	<ul style="list-style-type: none"> ▶ Exaggerated behavior ▶ May have loss of small-muscle control (e.g., focusing your eyes) ▶ Impaired judgment ▶ Usually good feeling ▶ Lowered alertness ▶ Release of inhibition 	<ul style="list-style-type: none"> ▶ Reduced coordination ▶ Reduced ability to track moving objects ▶ Difficulty steering ▶ Reduced response to emergency driving situations
.08%	<ul style="list-style-type: none"> ▶ Muscle coordination becomes poor (e.g., balance, speech, vision, reaction time, and hearing) ▶ Harder to detect danger ▶ Judgment, self-control, reasoning, and memory are impaired 	<ul style="list-style-type: none"> ▶ Concentration ▶ Short-term memory loss ▶ Speed control ▶ Reduced information processing capability (e.g., signal detection, visual search) ▶ Impaired perception
.10%	<ul style="list-style-type: none"> ▶ Clear deterioration of reaction time and control ▶ Slurred speech, poor coordination, and slowed thinking 	<ul style="list-style-type: none"> ▶ Reduced ability to maintain lane position and brake appropriately
.15%	<ul style="list-style-type: none"> ▶ Far less muscle control than normal ▶ Vomiting may occur (unless this level is reached slowly or a person has developed a tolerance for alcohol) ▶ Major loss of balance 	<ul style="list-style-type: none"> ▶ Substantial impairment in vehicle control, attention to driving task, and in necessary visual and auditory information processing

¹ Information in this table shows the BAC level at which the effect usually is first observed, and has been gathered from a variety of sources including the National Highway Traffic Safety Administration, the National Institute on Alcohol Abuse and Alcoholism, the American Medical Association, the National Commission Against Drunk Driving, and <http://www.webMD.com>.

Source: CDC (<http://www.cdc.gov/Motorvehiclesafety/pdf/BAC-a.pdf>)

1. Based on the effects listed in the table above, summarize why alcohol makes driving dangerous.
2. What BAC do you think should be the legal limit for driving? Why?
3. Research your own state's law. What is the legal limit in your state?
4. Besides driving, what other activities would be considered dangerous while intoxicated? List at least three.

NEW INFO: Ask students to engage in a brief debate about what they believe the legal BAC for driving should be. Students will likely have a range of opinions from zero-tolerance to more risky limits. Encourage students to support their belief with logic, evidence, and sound rationale, not emotion. Also, remind them to keep an open mind, as they only have a limited set of facts.



The liver can only process approximately one drink per hour. The BAC chart below gives a general sense of how many drinks per hour result in various BAC levels based on body weight.

Blood Alcohol Chart						
Body Number of Drinks per Hour						
Weight	1	2	3	4	5	6
100 lbs.	.038	.075	.113	.150	.188	.225
120 lbs.	.031	.063	.094	.125	.156	.188
140 lbs.	.027	.054	.080	.107	.134	.161
160 lbs.	.023	.047	.070	.094	.117	.141
180 lbs.	.021	.042	.063	.083	.104	.124
200 lbs.	.019	.038	.056	.075	.094	.113

Use the chart above to answer the questions about BAC:

1. If you weigh 140 lb, what is your BAC after 3 drinks in 1 hour?
2. Is this considered serious impairment?
3. What is your BAC if you weigh 120 lb and have had 5 drinks in 1 hour, but have not been drinking for the past 2 hours?
4. Is this considered serious impairment?
5. What is the legal limit for intoxication in all states?
6. What are the BACs for a 200 lb person and a 120 lb person after 3 drinks in 1 hour, respectively?

SLIDESHOW: Show standard drink pictorial (slideshow) prior to analyzing this chart, so that students understand what is meant by “one drink.” This standard drink chart should be briefly discussed prior to examining the BAC chart so that students understand how the chart can represent one drink of any type of alcohol, given these volume variances based on percent alcohol.

THINK: Ask students what factors might influence BAC, besides number of drinks consumed. From this table, they should quickly answer weight (body mass) and time. But they also may brainstorm factors like: tolerance, liver condition/function, amount and type of other liquid and food consumed, metabolism rates, gender, age, general health, etc. A key idea to take away is that there is no exact prediction of your resulting BAC when consuming a certain amount of a certain drink, and furthermore, two people with the exact same BAC may react very differently.

ASSESS Answers:

1. 0.08; 2. Yes, as it is the legal limit for driving in some states; 3. 0.156; 4. Yes; 5. 0.08; 6. 0.056, 0.094



Answer the questions below in short sentences.

1. What does BAC stand for and what does it show?

2. Why is measuring the blood alcohol content of a person useful?

3. Name 3 effects of alcohol intoxication that make driving dangerous.



Find a graph related to drinking and driving. Use the internet or any print material (magazines, etc.). Summarize the trends in you find in the graph. Print out the graph and bring it to the next class session.

ASSESS Answers:

1. BAC = blood alcohol concentration, shows how much alcohol is currently in the bloodstream (has not yet been processed and detoxified by liver), thus serves as a marker for expected effects since it shows how much is circulating through the brain as well.
2. It is useful to enforce safety laws, to help victims of alcohol poisoning in a clinical setting, and to generally understand the physiological effects of alcohol in research settings.
3. Impaired judgment, loss of balance, loss of coordination

HOMEWORK:

The purpose of this homework is to prepare students for the following lesson on graphing. In the next lesson, they will be asked to “tell a story” about what their graph is saying. If students are not prepared with their graph they will have to use the generic one provided in the lesson. It will be a much more engaging exercise if everyone has their own graph.