

# Alcohol's Effects on Organs

## WHAT YOU NEED

- [Alcohol and Its Effects on Organs](#)

ESHEET

- [Questions to Think About Student Sheet](#)

STUDENT ACTIVITY SHEET

- [Alcohol and Its Effects on Organs](#)

STUDENT ACTIVITY SHEET

- [Letter for Parents and Other Caregivers](#)

TEACHER SHEET

## MATERIALS

- Newsprint and markers



## PURPOSE

To help students explore the chemical and physical effects of alcohol on these human body organ systems: the digestive system, the central nervous system, the circulatory system, and the endocrine system.

## CONTEXT

This lesson is part of a series created by Science NetLinks as part of [The Science Inside Alcohol Project](#)

(<http://www.aaas.org/sites/default/files/migrate/uploads/siapbrochure.pdf>), funded by the National Institute on Alcohol Abuse and Alcoholism (NIAAA). For a complete list of materials, visit [The Science Inside Alcohol: Educational Materials](#) (<http://www.aaas.org/page/science-inside-alcohol-educational-materials>). The project has developed an e-book for students and four accompanying lesson plans that teach middle-school students about how alcohol affects the human body.

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Alcohol abuse has become increasingly prevalent among young people. Therefore, it is essential that they become aware of the potential dangers of alcohol abuse at an early age. In fact, research has shown that the younger students are when they begin learning about alcohol abuse, the greater their likelihood of staying away from it ([Make a Difference: Talk to Your Child about Alcohol](#) ([http://pubs.niaaa.nih.gov/publications/MakeADiff\\_HTML/MakeAdiff.pdf](http://pubs.niaaa.nih.gov/publications/MakeADiff_HTML/MakeAdiff.pdf)). Rockville, MD: National Institute on Alcohol Abuse and Alcoholism, 2000).

Other lessons in this series focus on the short- and long-term effects that alcohol has on the mind and body and how risky behavior that can result from drinking can affect—and harm—other people. This lesson emphasizes the chemical and physical effects that alcohol has on the digestive system, the central nervous system, the circulatory system, and the endocrine system.

In this lesson, students work in groups to study the four body systems. Some students focus on how a particular body system works and they prepare a presentation on it. Other students look at how impairments to these systems can affect an individual's life.

In addition, ideas in this lesson are also related to concepts found in the following Alcohol Learning Goals:

- Alcohol decreases the activity of the nervous system.
- The blood carries the alcohol throughout the body.
- The main route of metabolism of alcohol is its oxidation in the cells of the liver.
- Alcohol may have both positive and negative effects on the cardiovascular system.

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## PLANNING AHEAD

To provide you with sufficient background to teach this lesson, a PDF of the book *Delaying That First Drink: A Parents' Guide* has been provided. While there is much information in the book, the section that might be of particular interest to you is The Science Inside Alcohol.

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## MOTIVATION

Begin the lesson by handing out the Questions to Think About student sheet. Give students about 10 minutes to answer the questions. Tell them not to worry if they do not know all the answers. Explain that they will learn about these topics during the lesson.

- What is the alcohol we drink made of and how is it made?

(Ethyl alcohol is the alcohol that we drink. It comes from fermentation of grains such as corn, potato mashes, fruit juices, and beet and cane sugar molasses. Fermentation is the process through which carbohydrates such as sugar are turned into alcohol.)

- Why does drinking too much alcohol make people drunk?

(Ethyl alcohol is a drug that alters brain function, causing temporary changes in behavior, mood, and perception, among other things.)

- What are three important body organs that drinking too much alcohol can harm?

(Your liver: Too much alcohol can harm the liver's ability to remove poisons, germs, and bacteria from blood as well as produce immune agents to control infection. You cannot live without a functioning liver. Your brain: The brain is made up of more than 100 billion neurons, each making tens of thousands of connections. Too much alcohol can disrupt synaptic communication between neurons, perhaps altering parts that are still forming. You may not remember things that happen after you drink too much alcohol or be able to move and think as quickly as before. Your heart: Large quantities of alcohol can modify the signals that regulate heart function. As a result, blood flow to other organs is restricted. If organs are deprived of oxygen or nutrients, damage can result.)

- What are the main body systems affected by alcohol?

(The major body systems affected by alcohol are the digestive, central nervous, cardiovascular, and endocrine systems. Alcohol does not digest in the stomach like most foods or liquids; it goes straight into your bloodstream. Alcohol affects every body system and many organs as it travels in your blood.)

- Could one system of your body work without the others?

(No. The human body is made up of multiple systems all working together and supporting each other. Think of your body as though it were a computer. You cannot understand how a computer works just by listing the parts. Rather, you have to understand the connections and processes that it goes through to determine what makes it work. The same is true of the human body.)

- What causes a hangover?

(Hangovers are caused by drinking too much alcohol. A single alcoholic drink is enough to trigger a hangover for some people. About 75 percent of people who drink until they are drunk will have a hangover the next day.)

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## DEVELOPMENT

In this part of the lesson, students will learn more about how alcohol affects the digestive system, the central nervous system, the circulatory system, and the endocrine system by using [The Science Inside Alcohol Project](#) e-book.

To begin, students should use their [Alcohol and Its Effects on Organs](#) student sheet to go to The Science Inside Alcohol Project e-book and read through the Home page and Introduction.

Now, divide the class into four groups of about seven students. Assign each group to one of the four body systems. Tell about half the students in each group to develop a presentation about the assigned body system. The presentations can take the form of a PowerPoint slide show, a video, or a poster display. As a starting point, suggest that students consider these questions as they prepare their presentations (they can answer these questions on the [Alcohol and Its Effects on Organs](#) student sheet):

- What organs are in the body system?
- What is their function?
- How do the different organs work together?
- What impact does alcohol have on the system?
- Which organs in the body does alcohol affect?
- How do you think the impact of alcohol on the system you have been studying affects other systems in the body?

Tell the other half of the students in each group to look at how impairments to these systems can affect an individual's life. For example, ask students to consider what happens if overdrinking causes a young person to pass out or get sick to his/her stomach. What ramifications could such problems have over the short and long term?

To express these ideas, suggest that students develop a fictional story or draw a series of pictures describing how one night of drinking could result in several days of problems—getting in trouble with parents, missing school, or doing poorly on an exam.

In completing these assignments, students must use at least three sources, which should be listed at the end of their presentations. In addition to the e-book, students should use at least two of these online resources to complete their project:

- **Alcohol and the Human Body**
- **The Cool Spot** (<http://www.thecoolspot.gov/index.asp>)
- **Brown University Health Education**  
([http://www.brown.edu/Student\\_Services/Health\\_Services/Health\\_Education/](http://www.brown.edu/Student_Services/Health_Services/Health_Education/))
- **How Alcohol Works** (<http://science.howstuffworks.com/alcohol5.htm>)
- **Biological Aspects of Alcohol Use: An Overview**  
(<http://www.oregoncounseling.org/ArticlesPapers/Documents/ETOHBIOfx.htm>)
- **Interactive Body**  
(<http://www.collegedrinkingprevention.gov/CollegeStudents/anatomy/InteractiveBody>)
- **Blood Alcohol Information** (<http://www.bloodalcohol.info/how-alcohol-affects-your>)
- **Alcohol and Your Health** (<http://www.healthchecksyste.ms.com/alcohol.htm>)
- **The Effects of Alcohol on Physiological Processes and Biological Development**  
(<http://pubs.niaaa.nih.gov/publications/arh283/125-132.htm>)

Give students time in class to work on their presentations. Over the next couple of classes, make sure that each group has a chance to present its findings.

After all the groups have made their presentations, ask this question:

- How does too much alcohol affect all the body systems you have learned about?

As a class, develop a short paragraph summarizing their ideas. Write the paragraph on a sheet of newsprint. Look at this sample paragraph to get ideas:

"Alcohol goes directly into the bloodstream and travels throughout the body. Organs such as the brain, which contain a lot of water and need a lot of blood to function, are particularly vulnerable to the effects of alcohol. Alcohol makes the liver, which is the major organ that processes alcohol, work very hard. The pancreas, an organ in the endocrine system, may produce more insulin than is needed, leading to low blood sugar. Low blood sugar can make you feel hungry, nauseous, or nervous. In all these ways, alcohol affects four major systems in the body."

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## ASSESSMENT

Use the paragraph you developed with the class as an assessment to see if students have mastered the information about their body system. As you listen to the class discussion and the suggestions made for the paragraph (as well as the paragraph itself), consider these questions:

- Do students seem comfortable with the subject matter?
- Have they absorbed the information?
- Are they able to explain the information about their body system clearly and accurately?
- Are they able to make connections between the body system they researched and other body systems?

Next, hand out a clean copy of the **Questions to Think About** student sheet, which has the questions students were asked at the beginning of the lesson. Ask students to answer them again. Then collect the sheets and compare them to their earlier answers. This pre- and post-assessment instrument provides further insights into what students have learned and what areas they still don't quite understand.

Finally, ask students if they have some questions about alcohol use that they would like to see addressed in future lessons. Write down their ideas on a sheet of newsprint and use it as a resource when planning additional lessons.

To help students "stay with the program," have them involve their parents or caregivers. To inform parents/caregivers about students' work on this topic, consider using the **Letter for Parents and Other Caregivers**.

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## EXTENSIONS

This lesson is part of a series of lessons about alcohol use. Consider using the other lessons with your students to further educate them on this topic:

- **Alcohol's Effect on the Mind and Body**
- **The Social Ramifications of Alcohol Abuse**
- **Alcohol and Its Impact on the Brain**

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 **GRANT INFO**

 **Send us feedback about this Lesson >**

# Alcohol and Its Effects on Organs



## INTRODUCTION

In this lesson, you will learn about how alcohol affects the digestive system, the central nervous system, the circulatory system, and the endocrine system.

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## EXPLORATION

To begin, go to [The Science Inside Alcohol Project](http://www.sciencenetlinks.com/interactives/alcohol/ebook/index.htm) e-book and read the Home page and Introduction.

<http://sciencenetlinks.com/interactives/alcohol/ebook/index.htm>

Your assignment is to learn about how alcohol affects one of four body systems: the digestive system, the central nervous system, the circulatory system, or the endocrine system. To find out how alcohol affects the body system you've been assigned, go to [Alcohol and the Human Body](#) in the e-book and read about that body system. For more information, you can use any of these resources:

- [The Cool Spot](http://www.thecoolspot.gov/index.asp) (<http://www.thecoolspot.gov/index.asp>)
- [Brown University Health Education](http://www.brown.edu/Student_Services/Health_Services/Health_Education/) ([http://www.brown.edu/Student\\_Services/Health\\_Services/Health\\_Education/](http://www.brown.edu/Student_Services/Health_Services/Health_Education/))
- [How Alcohol Works](http://science.howstuffworks.com/alcohol5.htm) (<http://science.howstuffworks.com/alcohol5.htm>)
- [Biological Impacts of Alcohol Use: An Overview](http://www.oregoncounseling.org/ArticlesPapers/Documents/ETOHBIOfx.htm) (<http://www.oregoncounseling.org/ArticlesPapers/Documents/ETOHBIOfx.htm>)
- [Interactive Body](http://www.collegedrinkingprevention.gov/CollegeStudents/anatomy/InteractiveBody_flash.aspx) ([http://www.collegedrinkingprevention.gov/CollegeStudents/anatomy/InteractiveBody\\_flash.aspx](http://www.collegedrinkingprevention.gov/CollegeStudents/anatomy/InteractiveBody_flash.aspx))
- [Blood Alcohol Information](http://www.bloodalcohol.info/how-alcohol-affects-your-body.php) (<http://www.bloodalcohol.info/how-alcohol-affects-your-body.php>)
- [Alcohol and Your Health](http://www.healthchecksyste.ms.com/alcohol.htm) (<http://www.healthchecksyste.ms.com/alcohol.htm>)
- [The Effects of Alcohol on Physiological Processes and Biological Development](http://pubs.niaaa.nih.gov/publications/arh283/125-132.htm) (<http://pubs.niaaa.nih.gov/publications/arh283/125-132.htm>)

Use these resources to find out more information about your group's body system. You can use the questions on the [Alcohol and Its Effects on Organs](#) student sheet to help you organize your thoughts. This information should provide you with the background you need. Make sure you write down the resources you

used to complete this assignment. Remember, you have to use at least three.

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This esheet is a part of the **Alcohol's Effects on Organs** lesson.

## ESHEET DETAILS

Grades

6-8

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# Questions to Think About Student Sheet



## INTRODUCTION

Here are six questions about alcohol abuse and how it affects the body. See how many you can answer. Don't worry if you don't know the answers to some of them. You will learn about this topic during the lesson.

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What is the alcohol we drink made of and how is it made?

Why does drinking too much alcohol make people drunk?

What are three important body organs that drinking too much alcohol can harm?

What are the main body systems affected by alcohol?

Could one system of your body work without the others?

What causes a hangover?

# Alcohol and Its Effects on Organs



## INTRODUCTION

Use the resources on the Alcohol and Its Effects on Organs student esheet to help you develop your presentation.

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### Body System Presentation Project

Your teacher has assigned your group a body system. The job for your half of the group is to develop a presentation about that body system. Use the questions on this sheet to help you prepare your presentation, which can be in the form of a PowerPoint slide show, a video, or a poster display.

What organs are in the body system?

What is their function?

How do the different organs work together?

What impact does alcohol have on the system?

Which organs in the body does alcohol affect?

How do you think the impact of alcohol on the system you have been studying affects other systems in the body?

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### **Impairments to Body System Project**

The job for your half of the group is to look at how impairments to the body system you've been assigned can affect an individual's life. For example, you could consider what happens if overdrinking causes a young person to pass out or get sick to his/her stomach. What ramifications could such problems have over the short and long term?

To express these ideas, develop a fictional story or draw a series of pictures describing how one night of drinking too much alcohol could result in several days of problems (i.e., getting in trouble with parents, missing school, or doing poorly on an exam).

# Letter for Parents and Other Caregivers



Dear Parent/Caregiver:

Our class is currently working on a lesson entitled **Alcohol's Effects on Organs**. Along with the class, your child has been learning about how alcohol affects four systems in the body: the digestive, central nervous, circulatory, and endocrine systems. Your child has been working with his/her classmates to learn more about one body system. Each group has prepared a presentation about the assigned system and considered the impact of alcohol on other aspects of their lives.

We wanted to inform you about our work on this unit so that you will be prepared to discuss these issues at home. A helpful resource for getting a productive conversation started is *Make a Difference: Talk to Your Child about Alcohol*, which is available online at:

<http://www.alcoholfreechildren.org/en/pubs/pdf/makeadifference.pdf>. Over the next few weeks, we will discuss other topics related to teen drinking, including peer pressure and strategies for saying no.

Thank you for your support of our work on this important topic. If you have any questions, please do not hesitate to get in touch.

Sincerely,

This teacher sheet is a part of the **Alcohol's Effects on Organs** lesson.