

## Collecting and Analyzing Safety Data (1 hour 15 minutes)

### Section

Your Safety

### Investigative Questions

Why is data collection so important in helping prevent injuries? What injuries are most prevalent among the students in your class? How might those injuries be prevented?

### Description of Content

In this activity, students explore causes of injuries and deaths for kids in their age group. They first formulate a hypothesis and then conduct a class survey to find out the answers and test their hypothesis. They also participate in a deeper analysis of their results and see the quantity and quality of information that can be garnered from a simple classroom survey.

They then learn about the kinds of health data collection performed by the government and why these data are collected. They talk about some of the injury findings relevant to students in their age group. The data is available through the Centers for Disease Control and Prevention (CDC) National Center for Injury Prevention and Control's (NCIPC) Web-based Injury Statistics Query and Reporting System (**WISQARS™**), an interactive database system that provides customized reports of injury-related data. (All of the statistics mentioned throughout this activity come from NCIPC and WISQARS™ data available as of 2005, unless otherwise noted.)

Students also go to the *BAM! Body and Mind™* Web site and do the activities in the Your Safety section ([www.bam.gov/sub\\_yoursafety/index.html](http://www.bam.gov/sub_yoursafety/index.html)).

### Relevant Standards

This activity fulfills [science and health education standards](#).

### Objectives

Students will:

- Formulate a hypothesis about the leading causes of injuries to people their age
- Collect data from classmates on the injuries they have experienced
- Analyze the data and draw conclusions
- Examine data collected by the federal government on injury and death, and think critically about how that data might be used
- Discuss and analyze how to reduce the injuries and deaths that are most prevalent among people their age

## **Ideas and Behaviors Common Among Students**

This activity offers information from the literature on [ways your students may already think or act with regard to safety](#).

### **Materials**

- Burned out light bulb with three vertical and one horizontal (around the widest part) lines of tape—some of the bulb exposed
- Student Reproducible 1: *Injury Survey Form*
- *Class Injury Profile Form* for you to copy onto the board or create an overhead
- Student Reproducible 2: *Leading Causes of Death, Causes of Injury*

### **Safety**

Observe normal classroom safety procedures in this lesson.

### **Teacher Background**

Injuries are the leading cause of death for all Americans, including students in the middle grades. Beyond the number of deaths, there are millions of other students in this age group who sustain serious injuries.

About 7,000 of the 40 million children between the ages of 5 and 14 die each year. Of those deaths, 40 percent—about 2,800 each year—are from unintentional injuries (what your students probably call “accidents”).

Here are current statistics on the causes of injury-related deaths for children aged 5 to 14:

- Motor vehicle injuries are the leading cause of death.
- Drowning is the second leading cause of death.
- Nearly one-third of bicyclists killed in traffic crashes are children ages 5 to 14.

Although deaths are fairly uncommon, unintentional injuries are not. More than 4.3 million children ages 5 to 14 have an injury serious enough for an emergency room visit each year, or 1 in 10. Falls are the most common reasons for emergency room visits, causing more than 1,348,000 visits each year.

Although students may call these “accidents,” the fact is that many of these unintentional injuries are preventable. The *BAM!* Web site at [www.bam.gov](http://www.bam.gov) has information for students on preventing common injuries in the Your Safety section at [www.bam.gov/sub\\_yoursafety/index.html](http://www.bam.gov/sub_yoursafety/index.html). *BAM!* also offers safety tip cards at [www.bam.gov/teachers/handouts.html](http://www.bam.gov/teachers/handouts.html).

The CDC collects data on the number of people who are injured each year and how many die or suffer permanent disabilities as a result of those injuries. This activity uses the same data that health professionals use. A description of the statistical surveys on injury and

death used by the CDC can be found in the CDC Injury Fact Book ([www.cdc.gov/ncipc/Fact\\_book/05\\_Data.htm](http://www.cdc.gov/ncipc/Fact_book/05_Data.htm)). It is important for students to see how data is collected and analyzed by experts.

The CDC data can help isolate specific risk factors that cause injury and death. For example, data show that 95 percent of bicyclists who are killed are not wearing helmets. That fact helps organizations such as the CDC make recommendations and policy makers make laws that begin to address the problem by recommending/requiring helmet use.

### **Procedure**

#### *Engagement (5 minutes)*

1. Drop the taped light bulb on the floor to make a sound that will capture students' attention.
2. Tell students "Imagine the glass is your skull and the tape is your skin...and you fell on your head." Tell students they are going to talk about injuries.
3. Have students work with a partner to formulate their own hypotheses on what they think is the leading cause of injuries serious enough to require a visit to the doctor or emergency room among students in their class.

Tell students that a hypothesis is one possible explanation for a set of observations, or an answer to a scientific question. In science, a hypothesis must be something that can be tested. It is *not* a guess.

An example of a hypothesis might be:

**The number one reason for doctor or emergency room visits for students in our class is bicycle crashes.**

4. Give students a few minutes to think. Then have them write down their hypotheses.

#### *Exploration (20 minutes)*

1. Hand out the *Injury Survey Form*. Explain to students that they are now going to be health researchers and do a class injury survey. They will be looking at injuries severe enough to require a visit to the doctor or emergency room. In one case, burns, they will also look at injuries that took place but did not require professional medical attention. (The reason for addressing burns that did not require professional medical attention is that they are a memorable injury many students have experienced, which will provide the class with a good amount of data for their survey.)

**Note 1: Bullying or Abuse**

Since discussing injury, in rare cases, could yield information about injuries caused by bullying or abuse, be sure your students stick to the information that the questionnaire requests. Tell students they are collecting standard, objective information just as real researchers do. If you do learn of abuse, be aware of and follow your school system's policies for reporting it.

**Note 2: Severe Injury**

You may have in your class a student who was injured so severely that he or she has a permanent disability. Discussing the injury that caused his or her disability has the potential to affect the student's emotions, including evoking feelings of blame or guilt. Sensitivity to the student's feelings and ensuring that other students act as true researchers and collect only the information the questionnaire requests can help avoid these negative feelings, as well as maintain the student's privacy.

2. Students will work in pairs to interview their partner and fill in the *Injury Survey Form*. (When the individual forms are all filled out, students will compile the results together and create a *Class Injury Profile*. The *Class Injury Profile* form is found at the end of this activity so you can copy it onto the board or create an overhead.)
3. Review the *Injury Survey Form* with students so they know how to record their findings. Remind students that they are recording injuries that happened anytime during their lives. Explain that researchers must be very careful when assembling data. This type of research relies on careful questioning of subjects and careful recording of responses.
4. Tell students they should *not* record each other's names on the *Injury Survey Form*. When hospitals provide information on illness, injury, or death for databases, they do not include the person's name. This is to maintain each individual's right to privacy. Researchers do not need to know the name of the injured person, only their assigned identification number.

*Explanation* (30 minutes)

1. Give students time to work with their partners to complete the forms. Then, collect all papers, mix them up, and pass them out again. Reinforce that this is a way to maintain privacy, since researchers never reveal the names of their subjects.
2. Write the questions from the *Class Injury Profile* on the board (or make an overhead transparency form and show it on a screen or white board). Have students raise their hands to help you fill in the correct numbers so you can create a class profile. You also may have a small group of students do the tallying and prepare the profile for the entire class to see.

3. Have students look back at their hypotheses. Were their hypotheses supported by the data the class collected? Point out that a hypothesis does not always turn out to be supported by the data collected. But what the scientist learns from that experiment will help develop another hypothesis that may be supported by data.
4. Have students think critically about the data. What else can they learn about their class from the data they have collected? Have them express these findings as statements. For example, “Our class profile shows that 2 out of 25 students had burns severe enough to require a visit to the doctor or emergency room.” “Three out of the 12 boys in our class had injuries outside the house that were serious enough to require a visit to a doctor or emergency room, but only 1 of the 13 girls in our class had a similar injury.” Write these statements on the board.
5. Students should begin to see that many observations can be made from the data—for example, observations about the most common cause of injuries and whether more boys or girls were affected. This is why health professionals collect data. Information from one or two people might not tell much about the general health of a group of people, but a large amount of data can reveal a great deal.

*Elaboration and Evaluation (20 minutes)*

1. Tell students that just as they have collected information about injuries from their class. The federal government does the same thing, not through one survey of Americans, but by collecting data from many sources and combining them. This information allows public health professionals, policy makers, and others to draw conclusions (just as your students have done) and to take action to reduce or prevent injuries.
2. Give your students the following quick quiz. Reassure them that they are not expected to know the answers, but that they can make educated guesses based on their own experience as well as on the data they collected for their class. Ask students to write their answers to the three quiz questions on a piece of paper. Read each question and the possible answers.

After the quiz, tell students the correct answers and include some of the information in the explanation that follows each answer. The numbers are from the latest government data available (2003) from the CDC’s Web-based Injury Statistics Query and Reporting System (**WISQARS™**), an interactive database system that provides customized reports of injury-related data. You and your students can access this database for further research at [www.cdc.gov/ncipc/wisqars](http://www.cdc.gov/ncipc/wisqars).

## Quick QUIZ

### A. What is the leading cause of death for children ages 5 to 14 in the United States?

- a. Cancer
- b. “Accidents” (unintentional injuries)
- c. Flu and pneumonia

**Answer – b. Unintentional Injuries.** About 7,000 of the 40 million children in our country between the ages of 5 and 14 die each year. But of those deaths, 40 percent (just under half) are from unintentional injuries. The leading cause of death from unintentional injury is motor vehicle crashes. Here are the numbers for each of the major causes of death:

- Motor vehicle crashes (1,686)
- Drowning (333)
- Fire and flames (252)
- Mechanical suffocation (79)
- Falls (66)
- All other causes (420)

Although deaths from unintentional injuries are fairly uncommon, unintentional injuries in general are not. More than 4.3 million children ages 5 to 14 have an injury serious enough for an emergency room visit each year, or 1 in 10 children.

If your students are interested, here are the data on the deaths caused by the other two possible answers for this question. Annually, for children ages 5 to 14, cancer causes 1,072 deaths and flu and pneumonia causes 91 deaths, although many, many more children who get sick recover.

### B. Each year, more than 2.3 million kids ages 10 to 14 are treated in emergency rooms for unintentional injuries. What do you think is the most common reason for an injury?

- a. Dog bite
- b. Bicycle crash
- c. Other fall

**Answer – c. Other Fall.** The causes for injury are very different from the causes for death. Falls are the most common reasons for emergency room visits, causing more than 670,000 visits each year. Bike injuries rank fifth, with more than 141,000 emergency room visits each year. Dog bites (which cause about 42,000 visits) rank number 11.

For children ages 10 to 14, automobile crashes are the seventh leading cause of emergency room visits. But for people ages 15 to 24, car crashes are the second leading cause of emergency room visits—more than 900,000 per year. (This is one reason automobile insurance rates are so high for people in this age range.)

**C. Which of these statements do you think is most accurate?**

- a. Boys and girls ages 10 to 14 have about the same number of unintentional injuries that make an emergency room visit necessary.
- b. Boys ages 10 to 14 have more unintentional injuries that make an emergency room visit necessary.
- c. Girls ages 10 to 14 have more injuries that make an emergency room visit necessary.

**Answer – b. Boys have more injuries.** Each year, about 2.4 million children ages 10 to 14 make emergency room visits. Of that number, 63 percent (more than half or 1,510,501) are boys and 37 percent (922,442) are girls.

Boys have higher rates of injuries in every category except burns. Bicycle injuries are one category in which there is a large difference between the injury rates of boys and girls. Of the 142,062 total injuries on bicycles, 78 percent (110,930) were to boys, while just 22 percent (31,132) were to girls.

Your students might want to think about why this is true. What do boys at this age, in general, do that girls, in general, don't do? What do girls do that boys don't? Databases like these do not deal with the "why" of the numbers. They simply provide the data for others to interpret. This is a very important point to make about databases.

3. As you review the quiz, ask students if they were surprised by any of the numbers. Tell students that the numbers come from records kept by hospitals and emergency rooms, which record the number of patients who come in and what they were treated for. States also keep records about deaths—the age, gender, and cause of death. All these numbers are then collected into databases that allow public health professionals, policy makers, and others to keep track of the diseases or injuries that are the leading causes of injury or death.
4. Give your students Reproducible 2: *Leading Causes of Death, Causes of Injury*. The reproducible includes two charts:
  - Chart 1: *5 Leading Causes of Death in the United States, all ages, both sexes*
  - Chart 2: *11 Leading Causes of Nonfatal Unintentional Injuries in the United States, ages 10 to 14, all ages, both sexes*

This 2002 and 2003 data is from the WISQARS™ database. For the most up-to-date data, you can go to the database online at [www.cdc.gov/ncipc/wisqars](http://www.cdc.gov/ncipc/wisqars) and print out charts for your students.

Using these charts, have your students think critically about what they show. Here are key points and possible discussion questions.

### **Chart 1.**

Tell your students that this chart shows the leading causes of **death** for people of all ages. Have them read the chart to find out the leading cause of death for young people their age. (Unintentional injury) For what age groups is unintentional injury the leading cause of death? (Ages 1 to 44).

Now have your students look at the “All Ages” column on the chart. Where do unintentional injuries rank on this chart? (Fifth) Why do students think that might be? (Many more older people die of heart disease and cancer. That changes the ranking of unintentional injuries to fifth place overall.)

Help students understand it is important to look at the numbers of deaths as well as the rankings. For example, unintentional injury is the leading cause of death for people their age. For people aged 45 to 54, it ranks third. However, almost ten times more people aged 45 to 54 die of unintentional injuries than people their age (14,675 compared to 1,542 deaths for kids their age).

### **Chart 2.**

Tell your students that this chart shows the **unintentional injuries** serious enough to have required a visit to the emergency room. Notice how many more injuries are reported on this chart. Although 1,542 children aged 10 to 14 die of unintentional injuries each year, more than 2.3 million kids in that age group have unintentional injuries serious enough to require a visit to the emergency room. Moreover, there are many more injured people who aren’t represented on this chart because they didn’t go to the emergency room for their injuries.

Explain that the CDC had to find a way of categorizing injuries so all emergency rooms across the country report injuries in the same way. The categories they came up with are listed under “Cause of Injury” on the chart. It is important to note that creating a specific category for a type of injury means that many, many people are hurt this way—even for the categories with low overall percentages.

Ask your students to look at the chart closely. What is the most common cause of injury reported on this chart? (Falls) In your classroom survey, were falls the leading cause of injury that required a visit to the doctor or emergency room? They may not have been. Surveys of small groups like your classroom often do not have the same results as large surveys. What are the other causes of injuries listed on the CDC chart? Were any of these causes the same as on your class profile? Were students surprised by any of the rankings?

5. What kinds of people might use the CDC data? How might they use it? (Health professionals might need information to decide whether a public information campaign should focus on reducing bicycle injuries or on preventing burns in the



home. Hospitals might use the data to prepare for the types of injuries they most likely have to treat. Architects and builders might use data about falls to build buildings that are safer.) Have your students think of other examples.

### Performance Descriptors

For each of the following descriptors, rank students from 1 to 4, with 4 being the highest possible score and 1 being the lowest:

Descriptor	Student Score
The student engaged in the discussion about causes for injuries in their class and formulated a hypothesis about the leading cause.	4 3 2 1
The student interviewed a partner and recorded the data carefully.	4 3 2 1
The student actively took part in the class discussion and helped formulate the class profile.	4 3 2 1
The student used the class data to think critically and draw conclusions about what the data revealed.	4 3 2 1
The student participated in the quiz and in the class discussion afterward.	4 3 2 1
The student can explain at least one way the federal government collects data on injury and death, and at least one way the data can be used.	4 3 2 1
The student demonstrated critical thinking in analyzing the data charts from the WISQARS™ database.	4 3 2 1

### Extension

1. Send your students to the *BAM!* Web site. Have them review the information in the Your Safety section ([www.bam.gov/sub\\_yoursafety/index.html](http://www.bam.gov/sub_yoursafety/index.html)). Have your students conduct a campaign designed to encourage more young people to engage in a safe behavior, such as wearing a helmet when they are biking, roller blading, or skate boarding.
2. Have your students visit the Gear Up section of the *BAM!* Web site ([www.bam.gov/sub\\_yoursafety/yoursafety\\_gearup.html](http://www.bam.gov/sub_yoursafety/yoursafety_gearup.html)) to investigate the gear they need when they are participating in a favorite sport or outdoor activity.
3. Give your students the *BAM!* safety tip cards. You can print them out from [www.bam.gov/teachers/handouts.html](http://www.bam.gov/teachers/handouts.html).

### Text Correlations

Centre Point Learning, *Science II*, Observing and Recording Data, pp. 373-378  
 Centre Point Learning, *Science III*, Observing and Recording Data, pp. 547-548  
 Glencoe, *Science Voyages*, Level Red, Chapter 1, The Nature of Science  
 Glencoe, *Science Voyages*, Level Green, Chapter 1, The Nature of Science  
 Glencoe, *Science Voyages*, Level Blue, Chapter 1, The Nature of Science  
 Prentice Hall, *Science Explorer*, Conducting a Scientific Investigation

## Web Resources

Centers for Disease Control and Prevention: [www.cdc.gov](http://www.cdc.gov)

National Center for Injury Prevention and Control: [www.cdc.gov/ncipc/](http://www.cdc.gov/ncipc/)

This Web site includes statistical reports on a wide variety of injuries. It includes charts showing the 10 leading causes of injury, maps showing where different types of injuries are most likely to occur, and research on injury prevention. Injury fact sheets condense research on specific types of injuries (e.g., fireworks-related injuries, injuries from falls).

WISQARS™: [www.cdc.gov/ncipc/wisqars](http://www.cdc.gov/ncipc/wisqars)

The National Center for Injury Prevention and Control maintains the Web-based Injury Statistics Query and Reporting System (**WISQARS™**), an interactive database system that provides customized reports of injury-related data. The Web site includes a place where users can construct queries on specific types of injuries.

CDC *BAM! Body and Mind*™: [www.cdc.gov/bam](http://www.cdc.gov/bam) or [www.bam.gov](http://www.bam.gov)

*BAM! Body and Mind* is brought to you by the Centers for Disease Control and Prevention (CDC), an agency of the U.S. Department of Health and Human Services (DHHS). *BAM!* was created to answer kids' questions on health issues and recommend ways to make their bodies and minds healthier, stronger, and safer. *BAM!* also serves as an aid to teachers, providing them with interactive activities to support their health and science curriculums that are educational and fun.

Consumer Product Safety Commission (CPSC): [www.cpsc.gov/](http://www.cpsc.gov/)

The CPSC conducts data collection, analysis, and dissemination activities on the hazards and potential hazards of consumer products. If your students want to know how many emergency room visits were associated with a particular type of product (such as bicycles), they can find it on this site.

National Highway Traffic Safety Administration: [www.nhtsa.gov/](http://www.nhtsa.gov/)

The site includes the latest information on automobile safety, including statistics about traffic injuries and deaths. The State Traffic Safety Information database offers a state-by-state profile of traffic safety data and information including crash statistics, economic costs, legislation status, funding programs, and more.

U.S. Fire Administration: [www.usfa.fema.gov](http://www.usfa.fema.gov)

Fire Statistics: [www.usfa.fema.gov/statistics/](http://www.usfa.fema.gov/statistics/)

The site includes statistics on fires that occur in the United States and analytical and topical reports that describe the national fire problem. Also included are statistics related to firefighters and fire departments.

USFA Kids: [www.usfa.fema.gov/kids/flash.shtm](http://www.usfa.fema.gov/kids/flash.shtm)

A kid-friendly Web site that teaches students about fire safety and also provides activities and games designed to reduce fire-related injuries and deaths.

## **Relevant Standards**

### *National Science Education Standards*

#### Content Standard F, Grade 5-8: Life Science

##### Science in Social and Personal Perspectives:

The study of science-related personal and societal challenges is an important endeavor for science education at the middle level. By middle school, students begin to realize that illness can be caused by various factors, such as microorganisms, genetic predispositions, malfunctioning of organs and organ-systems, health habits, and environmental conditions. Students in grades 5-8 tend to focus on physical more than mental health. They associate health with food and fitness more than with other factors such as safety and substance use. One very important issue for teachers in grades 5 to 8 is overcoming students' perceptions that most factors related to health are beyond their control.

Students often have the vocabulary for many aspects of health, but they often do not understand the science related to the terminology. Developing a scientific understanding of health is a focus of this standard. Healthy behaviors and other aspects of health education are introduced in other parts of school programs.

#### Personal Health

- The potential for injuries and the existence of hazards imposes the need for injury prevention. Safe living involves the development and use of safety precautions and the recognition of risk in personal decisions. Injury prevention has personal and social dimensions.
- Natural environments may contain substances (for example, radon and lead) that are harmful to human beings. Maintaining environmental health involves establishing or monitoring quality standards related to use of soil, water, and air.

#### Risks and Benefits

- Risk analysis considers the type of hazard and estimates the number of people that might be exposed and the number likely to suffer consequences. The results are used to determine the options for reducing or eliminating risks.

- Students should understand the risks associated with natural hazards (fires, floods, tornadoes, hurricanes, earthquakes, and volcanic eruptions), with chemical hazards (pollutants in air, water, soil, and food), with biological hazards (pollen, viruses, bacterial, and parasites), social hazards (occupational safety and transportation), and with personal hazards (smoking, dieting, and drinking).
- Individuals can use a systematic approach to thinking critically about risks and benefits. Examples include applying probability estimates to risks and comparing them to estimated personal and social benefits.
- Important personal and social decisions are made based on perceptions of benefits and risks.

### *Benchmarks for Science Literacy*

By the end of 8<sup>th</sup> grade students should know that:

#### Chapter 3, Benchmark A, Grade 6-8: Technology and Science

Technology is an overworked term. It once meant knowing how to do things—the practical arts or the study of the practical arts. But it has also come to mean innovations such as pencils, television, aspirin, microscopes, etc., that people use for specific purposes, and it refers to human activities such as agriculture or manufacturing and even to processes such as animal breeding or voting or war that change certain aspects of the world. Further, technology sometimes refers to the industrial and military institutions dedicated to producing and using inventions and know-how. In any of these senses, technology has economic, social, ethical, and aesthetic ramifications that depend on where it is used and on people's attitudes toward its use.

Sorting out these issues is likely to occur over many years as students engage in design and technology activities. First, they must use different tools to do different things in science and to solve practical problems. Through design and technology projects, students can engage in problem solving related to a wide range of real-world contexts. By undertaking design projects, students can encounter technology issues even though they cannot define technology. They should have their attention called to the use of tools and instruments in science and the use of practical knowledge to solve problems before the underlying concepts are understood.

Idea 3. Engineers, architects, and others who engage in design and technology use scientific knowledge to solve practical problems. But they usually have to take human values and limitations into account as well.

#### Chapter 3, Benchmark B, Grade 6-8: Design and Systems

An idea to be developed in the middle grades is that complex systems require control mechanisms. The common thermostat for controlling room temperature is known to most

students and can serve as a model for all control mechanisms. But students should explore how controls work in various kinds of systems-machines, athletic contests, politics, the human body, learning, etc. At some point, students should try to invent control mechanisms, which need not be mechanical or electrical, that they can actually put into operation.

The concept of side effects can be raised at this time, perhaps by using actual case studies of technologies (antibiotics, automobiles, spray cans, etc.) that turned out to have unexpected side effects. Students should also meet more interesting and challenging constraints as they work on design projects. Also, students should become familiar with many actual examples of how over-design and redundancy are used to deal with uncertainty.

Idea 4. Systems fail because they have faulty or poorly matched parts, are used in ways that exceed what was intended by the design, or were poorly designed to begin with. The most common ways to prevent failure are pretesting parts and procedures, over-design, and redundancy.

#### Chapter 6, Benchmark E, Grade 6-8: Physical Health

Students should extend their study of the healthy functioning of the human body and ways it may be promoted or disrupted by diet, lifestyle, bacteria, and viruses.

- Viruses, bacteria, fungi, and parasites may infect the human body and interfere with normal body functions. A person can catch a cold many times because there are many varieties of cold viruses that cause similar symptoms.
- White blood cells engulf invaders or produce antibodies that attack them or mark them for killing by other white cells. The antibodies produced will remain and can fight off subsequent invaders of the same kind.
- The environment may contain dangerous levels of substances that are harmful to human beings. Therefore, the good health of individuals requires monitoring the soil, air, and water and taking steps to keep them safe.

#### Chapter 7, Benchmark D, Grade 6-8: Social Trade-Offs

Students at this level are very preoccupied by personal and social relationships. Their greatest concerns are usually peer approval and popularity, sexual development and feelings, personal appearance, and the struggle to separate from family and become an individual. They can consider personal and social consequences of individual choices in health (sexual activity, immunization), education (how different course choices limit future options), and popularity (how affiliation with one group might exclude a person from others). Students should assess tradeoffs that occur in the lives of their friends (or their own) and that offer only unwanted choices (such as sexual abstinence and venereal disease).

By the end of the 8th grade, students should know that:

- There are tradeoffs that each person must consider in making choices-about personal popularity, health, family relations, and education, for example-that often have life-long consequences.
- One common aspect of all social tradeoffs pits personal benefit and the rights of the individual, on one side, against the social good and the rights of society, on the other.
- Tradeoffs are not always between desirable possibilities. Sometimes social and personal tradeoffs require accepting an unwanted outcome to avoid some other unwanted one.

### *National Health Education Standards*

#### Standard 3

Students will demonstrate the ability to practice health-enhancing behaviors and reduce health risks.

Relevant performance indicators for grades 5 to 8:

- Explain the importance of assuming responsibility for personal health behaviors.
- Analyze a personal health assessment to determine health strengths and risks.
- Distinguish between safe and risky or harmful behaviors in relationships.
- Demonstrate strategies to improve or maintain personal and family health.
- Develop injury prevention and management strategies for personal and family health.
- Demonstrate ways to avoid and reduce threatening situations.

#### **Ideas and Behaviors Common Among Students**

- In focus groups exploring children's perceptions of injury, participants thought of the term "accident" as meaning being unpredictable and resulting in an injury that no one intended to happen. Children also saw it as their own job, rather than that of adults who care for them, to keep themselves safe through managing risks. Children described their injuries resulting from "not being careful," "being silly," "playing around," and "doing the wrong things" (Green & Hart, 1998).
- To prevent injuries, children say that they want specific advice rather than general warnings. They also believed that a completely risk-free environment would be "no fun." However, the more likely their friends and siblings were to adopt injury prevention behaviors, the more likely children were to minimize risks as well (Green & Hart, 1998; Liller et al., 1998).
- In a survey of boys and girls, boys were typically greater risk-takers than girls. More boys than girls only "sometimes" stayed away from lighters, matches, and

real guns. In addition, about half of all children “always” followed bicycle safety rules, wore a seatbelt, and swam with someone else. Yet while only about half of the students said that they had a fire extinguisher in the home, most reported having a working smoke detector and knowing their way out in case of a fire (Polivka & Ryan-Wenger, 1999).

- In a survey exploring bicycle helmet use, most middle school children understood that helmets could save their lives, although few reported actually wearing a helmet when riding. Many perceived little personal risk from bicycle riding, believing they would not have a bicycle injury or be hurt badly in such an injury during their middle school years (Liller et al., 1998).
- Many preteens say that they do not follow injury prevention behaviors such as wearing a bicycle helmet because it seems “ugly,” “silly,” “uncomfortable,” or “inconvenient,” or because of peer pressure (Liller et al., 1998; Berg & Westerling, 2001).
- When asked about their chance of a number of different types of injury and diseases, adolescents believed that they are at greatest risk for being injured in a motor vehicle accident (Ey et al., 2000).
- Adolescents’ perceptions of injury risk seem to differ by race and gender. Caucasian adolescents were eight times more likely than their African-American peers to perceive themselves as vulnerable to injury by car accident. Similarly, girls 11 to 19-years-old were three times more likely than boys the same age to see themselves at risk for a motor vehicle accident (Ey et al., 2000).
- Parents’ rules have an effect on children’s behaviors and number of injuries. For example, teenagers who had more parental rules restricting who could ride with them as well as how many passengers were allowed to ride with them were less likely to be distracted by friends while driving, get a ticket, drive too fast, or drive aggressively. Other studies have shown that families with more rules about safety have children with fewer injuries (Beck, Shattuck, & Raleigh, 2001; Peterson & Saldana, 1996).
- Education can help increase students’ knowledge of injury prevention behaviors. After participating in a school-based program, older elementary school children were most likely to increase their knowledge and have more positive attitudes about following bicycle rules, wearing bicycle helmets, and wearing seat belts than they did before the program or compared to peers who did not participate in the curriculum (Azeredo & Stephens-Stidham, 2003).

## References

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Student Reproducible 1:

### Injury Survey Form

Subject's age \_\_\_\_\_

Male \_\_\_\_\_ Female \_\_\_\_\_

#### Injuries Around the House

1. Have you ever been **burned severely enough to go to the doctor or emergency room?**

\_\_\_\_\_ Yes      \_\_\_\_\_ No

**If yes:** What caused the burn?

- \_\_\_\_\_ Candle
- \_\_\_\_\_ Matches
- \_\_\_\_\_ Hot oven or stove
- \_\_\_\_\_ Other (specify) \_\_\_\_\_

How old were you when you were burned?

- \_\_\_\_\_ Younger than 5
- \_\_\_\_\_ 5 and older
- \_\_\_\_\_ This year

*If you were burned severely enough to go to the doctor or emergency room more than once, write down the above questions on a separate piece of paper and answer them for each time you were burned.*

2. Have you ever been **burned seriously enough to hurt but not enough to go to the doctor or emergency room?**

\_\_\_\_\_ Yes      \_\_\_\_\_ No

**If yes:** What caused the burn?

- \_\_\_\_\_ Candle
- \_\_\_\_\_ Matches
- \_\_\_\_\_ Hot oven or stove
- \_\_\_\_\_ Other (specify) \_\_\_\_\_

How old were you when you were burned?

- \_\_\_\_\_ Younger than 5
- \_\_\_\_\_ 5 and older
- \_\_\_\_\_ This year

*If you were burned seriously enough to hurt (but not to go to the doctor or emergency room) more than once, write down the above questions on a separate piece of paper and answer them for each time you were burned.*

3. Have you had another kind of **injury around the house** that caused you to go to the to **the doctor or emergency room**?

\_\_\_\_\_ Yes      \_\_\_\_\_ No

For each case, answer the following questions:

**Injury 1:** What was the injury?

\_\_\_\_\_ Fall  
\_\_\_\_\_ Knife or other cut (describe) \_\_\_\_\_  
\_\_\_\_\_ Poison  
\_\_\_\_\_ Hit by an object  
\_\_\_\_\_ Other (describe) \_\_\_\_\_

How old were you?

\_\_\_\_\_ Younger than 5  
\_\_\_\_\_ 5 and older  
\_\_\_\_\_ This year

**Injury 2:** What was the injury?

\_\_\_\_\_ Fall  
\_\_\_\_\_ Knife or other cut (describe) \_\_\_\_\_  
\_\_\_\_\_ Poison  
\_\_\_\_\_ Hit by an object  
\_\_\_\_\_ Other (describe) \_\_\_\_\_

How old were you?

\_\_\_\_\_ Younger than 5  
\_\_\_\_\_ 5 and older  
\_\_\_\_\_ This year

## Injuries Outside the Home

4. Have you ever been injured seriously enough to go to **the doctor or emergency room for an injury that happened outside your home?**

\_\_\_\_\_ Yes      \_\_\_\_\_ No

For each case, answer the following questions:

### **Injury 1:** What was the injury?

- \_\_\_\_\_ Motor vehicle (car, truck, or bus)
- \_\_\_\_\_ Bicycle
- \_\_\_\_\_ Playground
- \_\_\_\_\_ Playing sports
- \_\_\_\_\_ Poison
- \_\_\_\_\_ Other (describe) \_\_\_\_\_

How old were you?

- \_\_\_\_\_ Younger than 5
- \_\_\_\_\_ 5 and older
- \_\_\_\_\_ This year

### **Injury 2:** What was the injury?

- \_\_\_\_\_ Motor vehicle (car, truck, or bus)
- \_\_\_\_\_ Bicycle
- \_\_\_\_\_ Playground
- \_\_\_\_\_ Playing sports
- \_\_\_\_\_ Poison
- \_\_\_\_\_ Other (describe) \_\_\_\_\_

How old were you?

- \_\_\_\_\_ Younger than 5
- \_\_\_\_\_ 5 and older
- \_\_\_\_\_ This year

**Class Injury Profile Form**

Number of students: \_\_\_\_\_ Boys \_\_\_\_\_ Girls

Total number of incidents (one student may have more than one incident) \_\_\_\_\_

**Burns severe enough to go to a doctor or emergency room:**

<b>Boys</b>	<b>Girls</b>
Cause: _____ Candle _____ Matches _____ Hot oven or Stove _____ Other (specify)	Cause: _____ Candle _____ Matches _____ Hot oven or Stove _____ Other (specify)
Age: Younger than 5 _____ 5 and older _____ This year _____	Age: Younger than 5 _____ 5 and older _____ This year _____

**Burns not serious enough to go to a doctor or emergency room:**

<b>Boys</b>	<b>Girls</b>
Cause: _____ Candle _____ Matches _____ Hot oven or Stove _____ Other (specify)	Cause: _____ Candle _____ Matches _____ Hot oven or Stove _____ Other (specify)
Age: Younger than 5 _____ 5 and older _____ This year _____	Age: Younger than 5 _____ 5 and older _____ This year _____

**Other injuries around the house serious enough to go to a doctor or emergency room:**

<b>Boys</b>	<b>Girls</b>
Cause: <input type="checkbox"/> Fall <input type="checkbox"/> Knife <input type="checkbox"/> Poison <input type="checkbox"/> Hit by object <input type="checkbox"/> Other (specify) _____	Cause: <input type="checkbox"/> Fall <input type="checkbox"/> Knife <input type="checkbox"/> Poison <input type="checkbox"/> Hit by object <input type="checkbox"/> Other (specify) _____
Age: Younger than 5 _____ 5 and older _____ This year _____	Age: Younger than 5 _____ 5 and older _____ This year _____

**Injuries outside the home serious enough to go to a doctor or emergency room:**

<b>Boys</b>	<b>Girls</b>
Cause: <input type="checkbox"/> Motor vehicle <input type="checkbox"/> Bicycle <input type="checkbox"/> Playground <input type="checkbox"/> Playing sports <input type="checkbox"/> Poison <input type="checkbox"/> Other (specify) _____	Cause: <input type="checkbox"/> Motor vehicle <input type="checkbox"/> Bicycle <input type="checkbox"/> Playground <input type="checkbox"/> Playing sports <input type="checkbox"/> Poison <input type="checkbox"/> Other (specify) _____
Age: Younger than 5 _____ 5 and older _____ This year _____	Age: Younger than 5 _____ 5 and older _____ This year _____

Student Reproducible 2:

## Leading Causes of Death, Causes of Injury

**CHART 1 – DEATH**  
**5 Leading Causes of Death, United States**  
 2002, All Races, Both Sexes

Rank	Age Groups										All Ages
	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	
1	Congenital Anomalies 5,623	Unintentional Injury 1,641	Unintentional Injury 1,176	Unintentional Injury 1,542	Unintentional Injury 15,412	Unintentional Injury 12,569	Unintentional Injury 16,710	Malignant Neoplasms 49,637	Malignant Neoplasms 93,391	Heart Disease 576,301	Heart Disease 696,947
2	Short Gestation 4,637	Congenital Anomalies 530	Malignant Neoplasms 537	Malignant Neoplasms 535	Homicide 5,219	Suicide 5,046	Malignant Neoplasms 16,085	Heart Disease 37,570	Heart Disease 64,234	Malignant Neoplasms 391,001	Malignant Neoplasms 557,271
3	SIDS 2,295	Homicide 423	Congenital Anomalies 199	Suicide 260	Suicide 4,010	Homicide 4,489	Heart Disease 13,688	Unintentional Injury 14,675	Chronic Low. Respiratory Disease 11,280	Cerebro-vascular 143,293	Cerebro-vascular 162,672
4	Maternal Pregnancy Comp. 1,708	Malignant Neoplasms 402	Homicide 140	Congenital Anomalies 218	Malignant Neoplasms 1,730	Malignant Neoplasms 3,872	Suicide 6,851	Liver Disease 7,216	Diabetes Mellitus 10,022	Chronic Low. Respiratory Disease 108,313	Chronic Low. Respiratory Disease 124,816
5	Placenta Cord Membranes 1,028	Heart Disease 165	Heart Disease 92	Homicide 216	Heart Disease 1,022	Heart Disease 3,165	HIV 5,707	Suicide 6,308	Cerebro-vascular 9,897	Influenza & Pneumonia 58,826	Unintentional Injury 106,742

**WISQARS™** Produced By: Office of Statistics and Programming, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention

Data Source: National Center for Health Statistics (NCHS), National Vital Statistics System

### Glossary

**Congenital anomalies** – Health problems that were present at birth

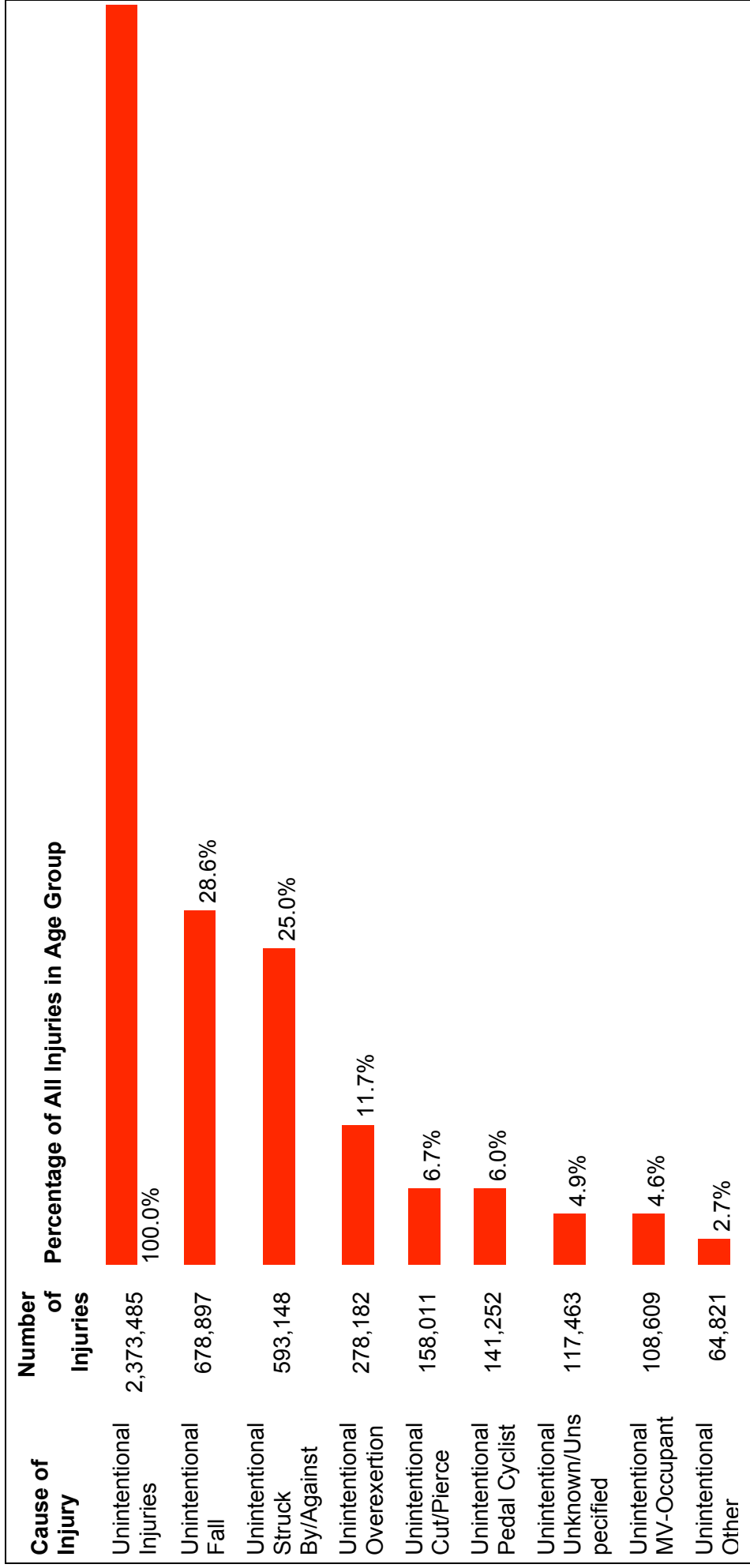
**Malignant neoplasms** – Cancerous growths

**Cerebro-vascular** – Injuries to the blood vessels in the brain

Student Reproducible 2:

## CHART 2 – INJURY

### 11 Leading Causes of Nonfatal Unintentional Injuries, United States 2003, All Races, Both Sexes, Disposition: All Cases Ages: 10 to 14





**Produced By:** Office of Statistics and Programming, National Center for Injury Prevention and Control, CDC

**Data Source:** NEISS All Injury Program operated by the Consumer Product Safety Commission (CPSC).

<sup>1</sup> Annualized national estimates are based on emergency department visits from 7/1-12/31 2000. Therefore, estimates may be affected by seasonality.

\* Stability calculations are not done on 'All Other' category.