

OBJECTIVES:

After this lesson students will be able to:

- Define the 6 vocabulary words
- Explain why safety belts don't fit all children
- Describe the correct way to wear a safety belt
- Explain why incorrect belt fit can be dangerous



1. Read and discuss the vocabulary words.

WHAT YOU WILL LEARN TODAY

Today you will learn that the way you wear a safety belt is very important. You will also learn why some safety belts may not fit some people, especially children, correctly. You will also try to figure out some ways to make belts fit better.

KEY WORDS:

**abdomen** (ab dō' men) the part of the human body containing the stomach, intestines

**design** (dē zīn') to draw or plan; to plan and draw in detail

**hip** (hip) the bony part that projects outward on each side of the body between the waist and the thigh

**organ** (ōr' gən) a part of a living thing that does a particular job: The heart and lungs are human organs

**pelvis** (pel' vis) the part of the skeleton made up of the bones that form the hips

**skeleton** (skel' ə tən) the internal framework of bones and cartilage that supports the body

DID YOU KNOW?

How safety belts should fit: Have you ever put the shoulder part of your safety belt behind your back or under your arm because it hit you in your face or cut across your neck? If you did, your seat belt didn't fit you correctly.

Seat belts need to fit your body correctly in order to protect you the best. This means that they need to be worn over the strongest parts of your body. Do you know what are the strongest parts of your body?

Your body's **skeleton** is the strongest part of your body. One of its jobs is to protect your internal **organs**, like your liver and spleen, from injury. Seat belts need the help of your skeleton system in order to work the right way. They must be worn across a strong, bony part of your body, like your shoulders, your **pelvis** and your chest bone. Serious injuries can occur if your safety belt is not in the right place. The lap portion must be worn low and snug across your **hips**, never across your **abdomen**. The shoulder portion must be worn across your shoulder and chest, not behind your back or under your arm.

2. Show the students a diagram of the human body. Have them identify the parts discussed in this lesson. Discuss the liver and how, with the force of a safety belt, the liver can be damaged. Compare the damage to a very bad bruise. With the liver though, it is much more serious.

3. Safety belts need to be worn correctly so that they can do their job to protect, not cause injury. Seat Belt Syndrome describes a pattern of injuries associated with seat belts that are worn incorrectly. These injuries can include liver lacerations, liver contusions, and spinal cord injuries. Although it is better to be restrained in a safety belt than unrestrained, it is very important that children are restrained in safety devices appropriate for their size and development.

## WHY SAFETY BELTS DON'T ALWAYS FIT:

There are different reasons why safety belts don't fit children.

- Sometimes moving around in the car can change how your safety belt fits.
- Sometimes wearing your safety belt too loose can cause the safety belt to be out of position.
- Sometimes not sitting up straight can cause your safety belt not to fit.



## SO WHAT CAN YOU DO TO MAKE A SEAT BELT FIT CORRECTLY?

Smaller children can use booster seats until they reach about 60 pounds. But what if you're too big for a booster and your safety belt still doesn't fit?

Some cars already have built-in features like a moveable bar by the shoulder part of the safety belt that allows you to change how the safety belt fits.

There are other products that claim they can help by adding something extra to the belt. But these may not be the best to use because they aren't approved by the government.

But one of the main reasons safety belts don't fit is because they are designed to fit adults, not children. Because adults are bigger than children, the safety belts may not fit. Imagine trying to wear your parent's clothes. The clothes might not fit your body, just like adult-size safety belts might not fit your body.

4. The National Highway Traffic Safety Administration (NHTSA) is responsible for assuring that child safety seats are safe. Add-ons or accessories to help belts fit are not covered under any regulation.

Add-on devices may claim to help position shoulder belts properly but there is some evidence which indicates they compromise the overall effectiveness of the safety belt system and may cause the lap portion of the safety belt to "ride-up" on the abdomen.

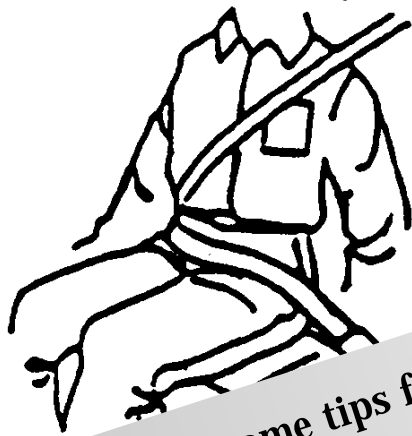
5. The students will come up with different ideas, but the main thing is that their inventions allow the safety belt to be positioned correctly. Encourage them to be creative. Discuss and display their designs.

## YOUR TURN

*Since it is so important for safety belts to fit correctly, try your hand at designing a better safety belt system for children. You can draw or build your safety system.*

### REMEMBER:

- *Safety belts must be worn snug, with the lap part across your hips.*
- *The shoulder part must go across your chest, not across your neck or in front of your face.*



Here are some tips for creating a successful design:

1. Make a plan.

If you build a safety system, include in your plan:

What kind of materials you will need

Where you will get your materials

How much they will cost

How much time it will take

What steps you will follow

2. Follow your plan step by step, but keep an open mind.

3. If your plan doesn't work, try another plan and another and another until you are happy with your design.

Once you are finished with your design, write a letter to an imaginary company who might help you manufacture and sell your product. In your letter, you will need to do the following:

- Describe the problem
- Tell how your design will help solve the problem
- Explain how your design works

6. Students should use letter form. Have them edit each other's letters.

8. Are there any companies in your area involved with designing products related to safe transportation? Start with automobile companies, seat belt companies, car seat companies, or your department of transportation. If there is not a company that deals with automobile transportation, consider other transportation issues like bus or bicycle safety. Invite an engineer or representative of the company to speak to your class. They can help explain what it takes to design a product.

## ON YOUR OWN

**Enter your design in your school's science fair or invention convention.**

**Ask five students in your school if their safety belt fits. Compare your answers with your classmates.**

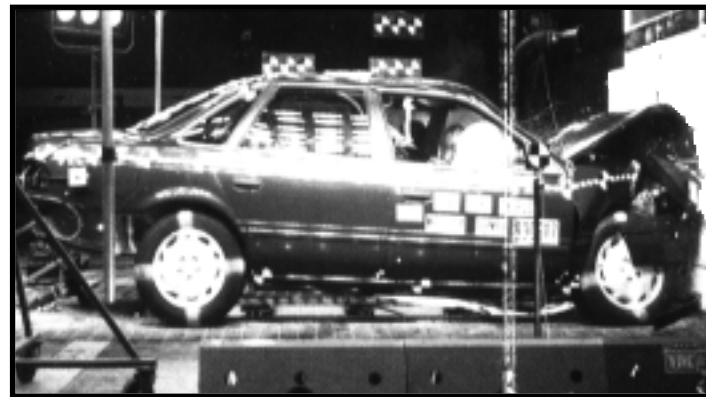
**Some companies design vehicles. Others design safety belts. Still others test the vehicles and safety belts to make sure they meet government safety standards.**

**Contact one of these companies and find out more about what they do. Some companies will conduct tours for school groups. Here are the names and addresses of a few companies to help you get started.**

**VEHICLE RESEARCH AND TEST CENTER**  
National Highway Traffic Safety Administration  
513-666-4511, P.O. Box 37, East Liberty, OH 43319  
Testing facility for vehicles, child restraints, and other transportation related issues.

### **COSCO, INCORPORATED**

812-372-0141, 2525 State Street, Columbus, IN 47201  
Manufactures juvenile products, including car seats and boosters. Has its own crash sled facility.



### **PATENTS**

Have you ever heard of a patent? Patents make sure that no one else can claim your idea. Patents are given for new inventions or new improvements in known products. For more information about patents you can contact the US Patent Office in Washington, DC.  
**1-800-786-9199**

## SAFETY FACTS

Car crashes are one of the leading causes of death and injury to children.

Safety belts save lives.

Safety belts should be worn low and snug across the hips and across the chest.

Children should sit in the rear seat, far away from a passenger side airbag, and be properly restrained.