

# Be an Engineer!

Pick a sport that you enjoy playing. List parts of the body that could get injured while playing that sport. Then design a new piece of equipment to protect those body parts. Draw a diagram and discuss it with your friends. Change your design if you come up with new ideas.

Then build a model of your design. Write about the features of your piece of equipment and share your ideas with the class. Explain how your design will protect people who play the sport you chose.

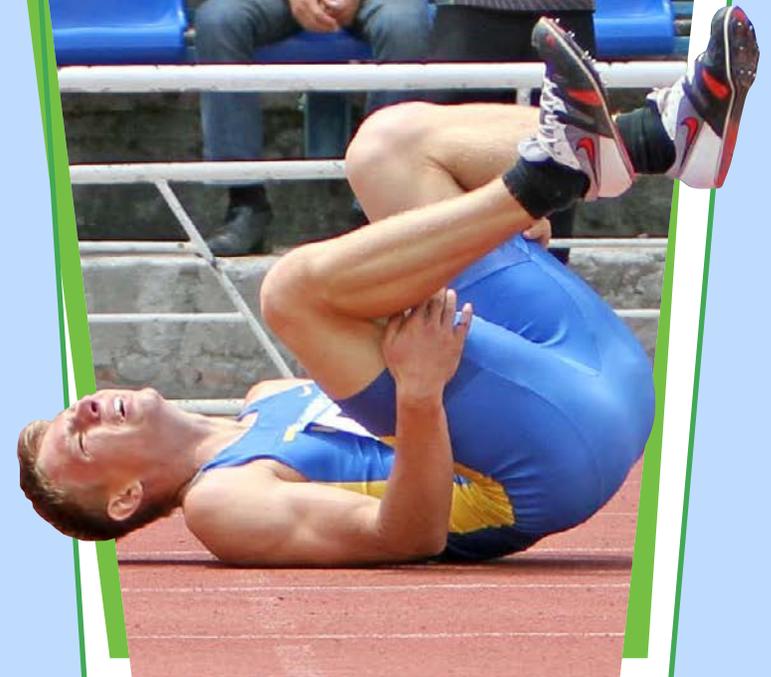


## Beyond the Book

Use books or the Internet to find out how scientists and engineers are working to help athletes avoid concussions.

FOCUS Book

# SPORTS INJURIES



: Science A-Z 





# SPORTS INJURIES



## FOCUS Question

What are sports injuries, and how can you prevent them?

Cause and Effect

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## It Hurts!



Sometimes people playing sports try to do things that are too hard or dangerous, and they injure themselves.

Playing sports, whether team sports or individual sports, sometimes means getting injured. People fall. They crash into things. They twist the wrong way. They get too hot or dehydrated. When someone has an injury, it hurts! Pain is the body's way of letting us know that something is wrong with our body.

Kids ages five to fifteen are more likely to get sports injuries than adults. That's because adults' bodies are mostly done growing. But kids' bodies are still growing and changing.

### Do You Know?

Of the 30 million kids who play sports in the U.S. each year, 3.5 million report having injuries.

## Read-Think-Write

Write your answers on separate paper. Use details from the text as evidence.

- 1 What are two reasons that kids are more likely to be injured playing sports than adults?
- 2 According to the table on page 3, which sport resulted in the most visits to the emergency room—baseball, bicycling, or skateboarding?
- 3 How are strains and sprains alike and different?
- 4 Why can it be helpful to put ice on injuries?
- 5 What is a concussion, and what should athletes do if they get one?

### FOCUS Question

What are sports injuries, and how can you prevent them? Think of one sport you like to play or watch. First, explain some of the injuries that can happen in that sport. Then explain several ways people who play that sport can protect themselves from injuries.



## Kids and Sports Injuries

One way kids are different from adults is that their heads are heavier compared to their bodies. Because of this difference, neck injuries are more likely in children.

Also, kids are not fully grown, so their muscles may not be strong enough to protect their ankles, knees, and other joints. Their bones may break more easily.

Kids also have less developed coordination and balance, so they fall more often than adults. They have slower reflexes, too. Kids may also not fully understand the risks.

Some injuries, like bruises and scrapes, heal quickly. More serious injuries take longer to heal.



Emergency room visits in a typical year in the U.S. for kids ages 5 to 14

Sport	Number of Visits
Football	215,000
Bicycling	200,000
Basketball	170,000
Baseball/Softball	110,000
Soccer	88,000
Skateboarding	66,000
Skating	47,000
Skiing	25,000
Ice Hockey	20,000

Emergency room visits by kids with sports-related injuries have increased each year over the past decade.

## Strains and Sprains

Some injuries can take weeks or months to heal. *Strains* result from tearing *tendons*, the tissues that connect muscles to bones. *Sprains* result from tearing *ligaments*, the tissues that connect bones together. For example, ligaments hold the bones in the knee together.

When strains and sprains occur, the body pushes blood and nutrients to the injured area to aid healing. This causes swelling and more pain. Ice and some medicines decrease swelling. This may reduce the pain, but it does not aid healing. These injuries heal over time with a lot of rest. Some athletes have surgery to repair torn ligaments sooner.

### Do You Know?

Baseball pitchers often suffer ligament damage to elbows and shoulders from repeatedly throwing a ball.



## Recovery

You can't prevent all injuries. Sometimes you get hurt even when you are careful. Pain tells you that you are injured. Pay attention to pain and get proper medical care. If you avoid or delay telling someone about an injury, you put yourself at risk for even greater injury.

Sprains, strains, fractures, and concussions need time to heal properly. After an injury, you must rest to prevent more damage.

Sports are fun and great for your health. With a little planning, you can prevent injuries and keep your head in the game!



## Prevention

If you play sports, there are many things you can do to stay safe.

- Proper training makes muscles stronger, protects ligaments and tendons, and increases endurance.
- Using sports equipment correctly and learning proper techniques can help prevent injuries.
- Warming up before playing increases blood flow and raises your heart rate and breathing.
- Stretch *before and after* playing sports.
- Wear properly fitting safety equipment such as helmets and pads.
- Finally, play by the rules. Sports have rules that protect players from injury.



Stretching and warming up both loosen muscles before playing sports and help prevent strains.

## Fractures

Athletes can break, or *fracture*, bones by falling wrong or crashing into something. Sometimes, playing sports can cause a *stress fracture*. This kind of injury happens when a bone is hit, bent, or used again and again. It is similar to bending a wire back and forth until it breaks. Stress fractures are common in sports in which athletes run or jump, including volleyball, basketball, and gymnastics.

To heal a fracture, athletes wear a *cast* to keep a broken bone from moving. In children, bones usually heal quickly. But kids' bones are still growing. Doctors take special care to make sure a fracture in a growing bone heals properly and doesn't cause permanent damage.



An X-ray allows doctors to see the bones inside your body to tell whether one is broken.

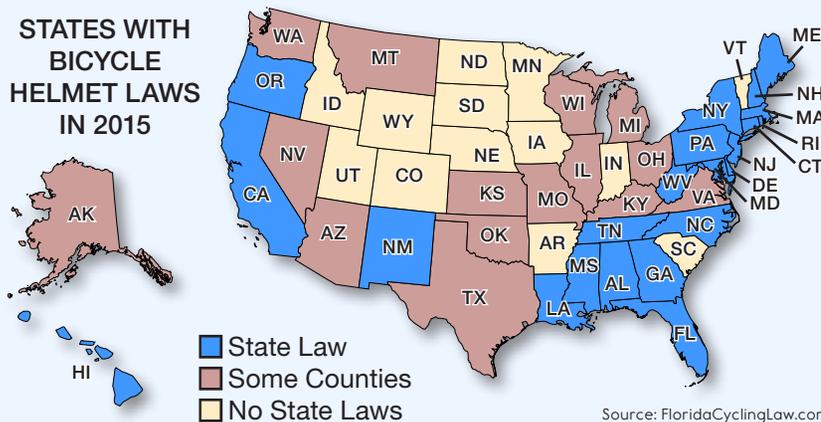
# Concussion

A concussion is an injury to the brain. When the head is hit, the brain can be injured as it bounces around inside the skull. The person may feel the pain of the hit and have a headache. They may have trouble talking and appear dazed or confused. They may be dizzy, have ringing in the ears, and not be able to remember things. Sometimes a concussion will cause a person to pass out, or become unconscious. Concussions can have a lasting effect on how the brain functions.



Wearing a helmet while riding a bike is an important way to protect yourself from a concussion.

STATES WITH BICYCLE HELMET LAWS IN 2015



Source: FloridaCyclingLaw.com

People with concussions may think they can “shake it off” and continue playing. But playing with a concussion can cause even more damage to the brain. Just like a strain, sprain, or fracture, a concussion takes time to heal. It takes a week or more for chemicals in the brain to return to normal. Players may continue to have headaches and memory loss. They may feel tired. They may also find it hard to concentrate.

Experiencing many concussions can make symptoms worse. Long-lasting effects include depression, memory loss, and changes in personality.



**safety** A person with a concussion should not do things that require concentration, like riding a bike, reading, or even watching television. The brain needs time to rest.

Concussions are a common risk when playing tackle football, even while wearing a helmet.