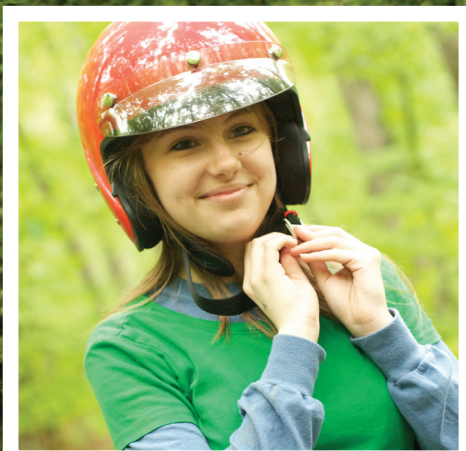


All-terrain Vehicle Safety

Every Ride. Every Time.



Injury Prevention Center
It only takes a moment. archildrens.org

Thank you for your interest in ATV safety.

The goal of this tool kit is to increase awareness of safe
ATV riding behaviors among youth and their parents.

The tool kit provides information to lead participants to an
informed discussion about the dangers of ATV use and safety
recommendations to avoid serious injury or death.

Version 1.0 – 9/2010

Introduction

The tool kit has been developed around “A Trip Unplanned,” a video produced by the Injury Prevention Center (IPC) at Arkansas Children’s Hospital and the Arkansas Game and Fish Commission. The video illustrates the critical thinking that ATV users need in order to safely operate their vehicle.

In addition to the video, the tool kit contains:

- Discussion guides with questions to generate discussion on ATV use, risks, and safety behaviors.
- Lesson plans for core courses of English, Science, Math, and Social Studies.
- Posters to reinforce key safety messages.
- Brochures for distribution.
- Ideas for conducting an expanded activity, such as an ATV Safety Week.
- A PowerPoint presentation on a CD that can be used to tailor presentations to a variety of audiences.
- A CD that contains print-ready files of the tool kit’s posters and brochures.
- Resources for more information.

The tool kit can be used in a variety of settings – hunter safety education, civic groups, classrooms, and service organizations. Although the materials are designed to complement each other, they can also be used individually. Each set of discussion questions contains approximate time required, factual data illustrating the significance of injuries, and a summary of key messages.

While examples within the tool kit are specific to Arkansas, you can also tailor the activities to your state or community. Your state’s public health department may be able to provide you with emergency transport, fatality reports, and/or hospital data to define the scope of the problem of ATV-related injury in your state. Hospital emergency departments and trauma programs also may be able to provide you with information regarding injuries due to ATV use and riding behaviors that led to serious injuries. Lastly, collecting news articles on ATV deaths in your state can be sobering. At the IPC, we catalog news articles and videos into an ongoing data base. These files help describe the human impact of ATV-related injuries.

The tool kit was developed and evaluated for use in classroom and hunter safety education settings in Arkansas, Louisiana, and South Carolina. The visual aids in the tool kit were developed based on preferences and recommendations received through focus groups with youth who ride ATVs and their parents in the same three states.

Materials in the tool kit may be reproduced for local use. Logos of local sponsors of ATV safety education may be added; however, we respectfully request that original logos not be removed.

Contents of the tool kit can assist in meeting the following National Health Education Standards:

Grades 6-8:

1.8.5 Describe ways to reduce or prevent injuries and other adolescent health problems.

1.8.7 Describe the benefits of and barriers to practicing healthy behaviors.

1.8.8 Examine the likelihood of injury or illness if engaging in unhealthy behaviors.

1.8.9 Examine the potential seriousness of injury or illness if engaging in unhealthy behaviors.

2.8.7 Explain how the perception of norms influences healthy and unhealthy behaviors.

7.8.3 Demonstrate behaviors that avoid or reduce health risks to self and others.

Grades 9-12:

1.12.5 Propose ways to reduce or prevent injuries and health problems.

1.12.7 Compare and contrast the benefits of and barriers to practicing a variety of health behaviors.

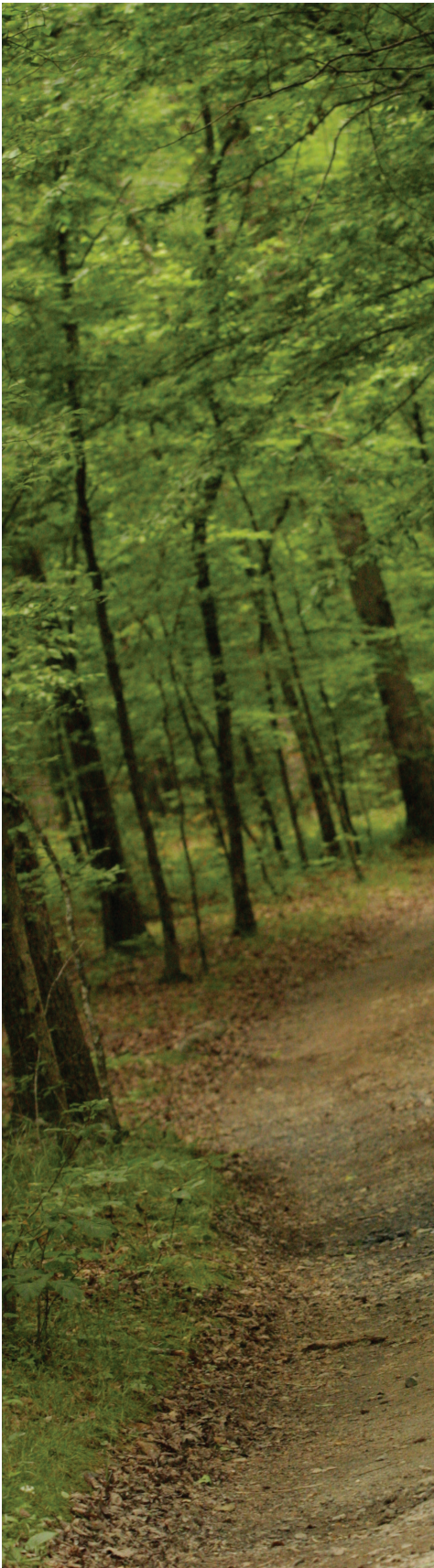
1.12.8 Analyze personal susceptibility to injury, illness or death if engaging in unhealthy behaviors.

1.12.9 Analyze the potential severity of injury or illness if engaging in unhealthy behaviors.

2.12.7 Analyze how the perceptions of norms influence healthy and unhealthy behaviors.

7.12.3 Demonstrate a variety of behaviors that avoid or reduce health risks to self and others.

Background Information



ATVs are becoming more and more popular among young people, especially those living in rural areas. As the popularity of ATV use has risen, so too have the number of deaths and injuries to people of all ages.

Nationally, riders age 16 and under represent over a quarter of those killed or injured on ATVs. From 2000-2007 an estimated 5,027 people died in ATV related crashes. Of those deaths 23% (1,135) were youth under age 16. During this same time period, an estimated 1,012,000 people were treated in hospital emergency departments for ATV related injuries. Youth age 16 and under made up approximately 30% (306,400) of those hospital visits.¹

National Statistics:

- Nearly 90% of children under age 16 who are injured on ATVs were riding machines meant for adult use only.²
- Less than 4% of ATV-related injury victims report receiving any formal ATV safety training. In 2007, only 18 states had formal education standards for ATV operators.²
- 20 states have no age requirements to operate an ATV, while 40 states allow 12-year-old children to operate ATVs without adult supervision.²
- Children younger than 16 years of age account for 14% of ATV riders nationally, but 37% of ATV-related injuries and 28% of ATV related fatalities.³

Arkansas Statistics

- Average number of deaths per year in Arkansas between 2000 and 2006 (7-year average) is 18 annually.⁴
- We have seen an increase of 94% in the number of admissions to Arkansas Children's Hospital between 1998 and 2008.⁵

It has been demonstrated that targeted safety education can result in behavior change that translates to fewer injuries. Educational campaigns to increase use of bicycle helmets, seatbelts, and car seats have shown positive results in improving safe practices and decreasing injury number and severity.⁶⁻⁸

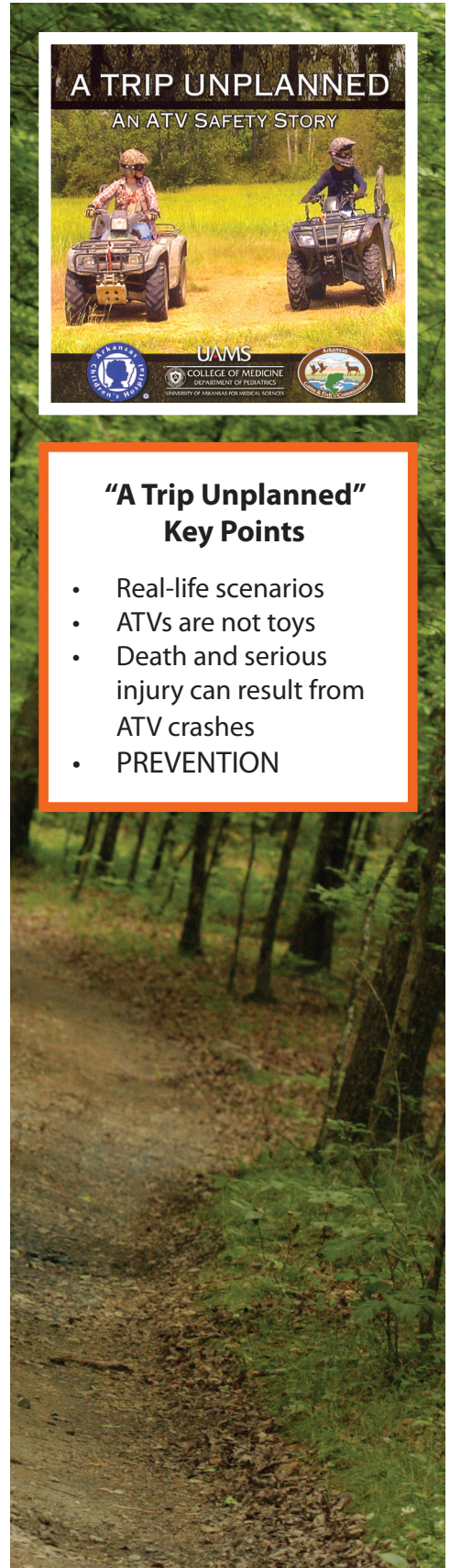
Viewing the Video (20 min)

The video in the tool kit, "A Trip Unplanned," lasts approximately 20 minutes.

The content of the video contains some very graphic scenes, and may not be appropriate for audience members younger than 10.

Introducing the video

- Before showing the video it might be helpful to let the audience know that the film is based on real-life scenarios. The viewers themselves may know someone or heard of someone who's been injured in an ATV crash.
- ATVs are not toys. Machines vary in size from "youth models," 50 cc motors weighing around 150 pounds, up to 950 cc motors weighing in excess of 700 pounds and capable of reaching very high speeds.
- Every year approximately 142 kids, age 16 and under, are killed in ATV-related crashes and another 38,300 require treatment in a hospital for ATV related injuries.¹
- Many ATV injuries could have been prevented with the use of safety equipment or changes in riding behaviors.



Discussion Guides

Opportunities for Thought and Action

Fast Facts

80% of Arkansas survey respondents between ages 10-18 have ridden an ATV in the previous 12 months.⁹

Each year approximately 142 ATV riders age 16 and under are killed in an ATV crash.¹

An additional 38,300 riders age 16 and under require treatment in a hospital for ATV-related injuries each year.¹

Notes

Learning Objectives (10 minutes)

After discussing this section, participants will:

- Discuss the extent of ATV use in their community.
- Discuss the extent of ATV-related injuries in their community.

Discussion

1. **How many of you have been on an ATV in the last month?**
2. **How many people do you know who have had a crash on an ATV?**
3. **Each year approximately 142 ATV riders who are children or teens are killed in a crash. Look around the room at this group as a comparison to the number killed. How many classrooms of youth would be killed each year?**

Discussion Summary

Key Messages:

- Youth in rural areas have a high rate of exposure to ATV use.
- Riding an ATV can result in serious injury or death if not used properly.

Helmets

Learning Objectives (5 minutes)

After discussing this section participants will:

- Identify helmets as the most important piece of safety gear.
- Discuss why helmet use is important.

Discussion

1. **In the DVD, what safety gear did the mother want the boys to wear?**
 - ☐ Helmet
2. **Why are helmets the most important safety gear when riding an ATV?**
 - ☐ Injury to the head and neck can cause paralysis or even death.
 - ☐ ATVs are top heavy and roll over very easily, leaving the head extremely vulnerable.
 - ☐ In a crash, the body continues to move forward at the same speed at which the ATV was going until it hits a stationary object. Impacting your head with this kind of force can cause serious death or injury.
 - ☐ Helmets coupled with face guards and goggles also protect the eyes and mouth.
3. **In what other activities are helmets required?**
 - ☐ Football
 - ☐ Baseball when at bat
 - ☐ Construction work
 - ☐ Auto racing
4. **Would you engage in these other activities without wearing a helmet? Why not?**

Discussion Summary

Key Messages:

- Helmets are a normal part of many activities in which a person is at risk for a head or brain injury.
- Wear a helmet. Every Ride. Every Time.

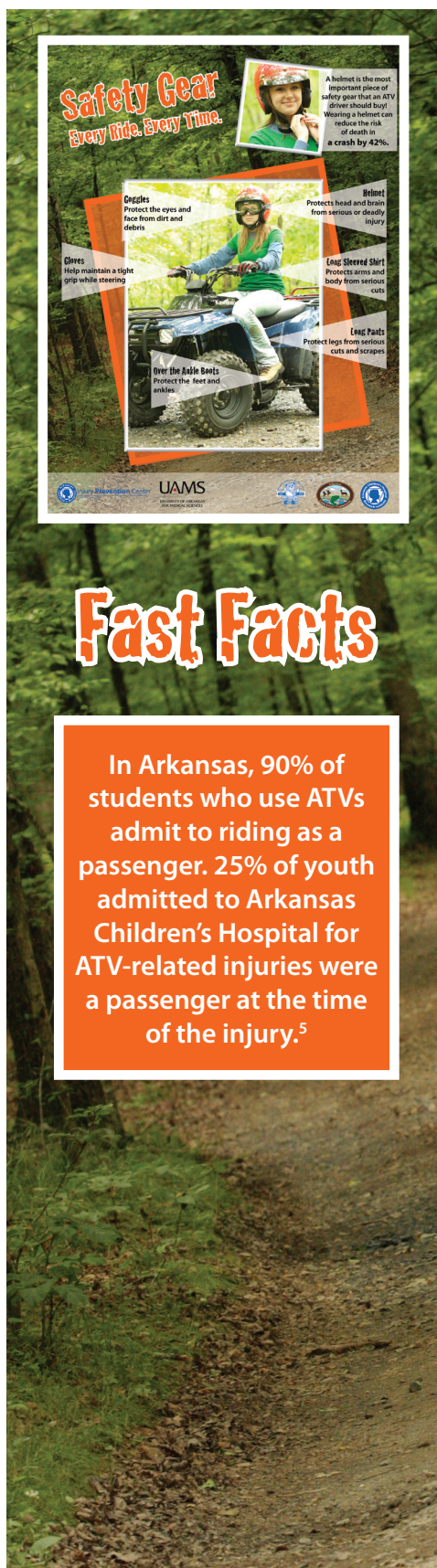


Fast Facts

Wearing a helmet can reduce the risk of dying from a brain injury received in an ATV crash by 42%.¹⁰

Notes

Passengers



Learning Objectives (5 minutes)

After discussing this section participants will:

- Explain why it's unsafe to carry passengers on an ATV.
- Describe the term "rider active" on an ATV.

Discussion

1. **Most ATVs are not designed for passengers. Warning labels on ATVs will tell you whether or not the ATV is safe to carry passengers. What engineering designs make it unsafe for passengers?**

- ☐ ATVs are rider active machines –
 - Shifting of the driver's weight actually helps to steer the ATV. Passengers change the machine's balance.
- ☐ ATVs not designed for passengers do not have foot pegs or separate seating –
 - Feet can become entangled in the moving parts of an ATV.
 - Increased risk of being thrown from the ATV.
 - Feet can become entangled in objects on trails.

2. **Some manufacturers are now building larger, longer ATVs designed to carry one passenger.**

- ☐ An ATV is not designed for passengers unless all of the following are present:
 - Extra and separate seat.
 - Extra foot rests.
 - Manufacturer's warning label.

Discussion Summary

Key Messages:

- Unless specified otherwise, ATVs are not designed for passengers.
- Carrying passengers on single user machines can cause the ATV to become unstable and harder to control.

Getting Started

Learning Objectives (5 minutes)

After discussing this section participants will:

- Determine if an ATV is a proper fit for the age and size of the user.
- Discuss the importance of completing a hands-on training course.

Discussion

1. **The first step to learning to ride an ATV is to select a machine appropriate for the age and size of the rider. One size does not fit all. How many of you believe the ATV you regularly ride is the proper fit for your size and age?** *(Ask the question again after discussing how to measure appropriate fit.)*

Recommendations are:

- ☐ Locate the manufacturer's age recommendation warning label on the machine and abide by its warning. Always heed this advice before checking any of the following guidelines.
- ☐ Seated on the ATV with feet on the foot pegs, the upper leg and lower leg should form a 90-degree angle. If there is a big angle difference either way, don't ride this machine.
- ☐ Standing on the foot pegs with hands on hand grips, there should be 3 to 6 inches between the ATV seat and the inseam of the driver's pants (flex space).
- ☐ With your feet on the pegs, you should be able to reach the foot brakes or clutch if the ATV has a manual clutch.
- ☐ Sitting normally on the ATV with your hands on the hand grips, there should be a slight bend or angle at your elbow. If your arm is straight, you will not be able to turn the handlebars well enough to safely ride the ATV.
- ☐ Again, while sitting on the ATV and having your hands gripping the hand grips, you should be able to squeeze the hand brakes and operate the throttle without shifting seat position to perform these operation tasks.



Fast Facts

Nearly 90% of children under age 16 who are injured on ATVs are riding machines meant for adult use only.²

Notes

Getting Started



Notes

Discussion (cont)

2. **ATV drivers, regardless of their experience, can benefit from hands-on training, such as the course provided by the ATV Safety Institute. In some areas, the local 4-H program may provide the training. What skills do you believe should be taught in an ATV training course?**

- ☐ Riding an ATV requires more extensive skills than just starting and stopping.
- ☐ Training can teach you to anticipate and respond to changes in terrain.

Discussion Summary

Key Messages:

- An ATV appropriate for the age and size of the driver is an important safety factor.
- Even experienced riders can benefit from training.

Plan Your TRIPSS

Learning Objectives

(10 minutes)

After discussing this section participants will:

- State what the TRIPSS acronym stands for.
- Understand specific risks of ATV use.
- Identify action steps to take for safe ATV riding.

Discussion

1. A convenient way to remember safety recommendations is the acronym “TRIPSS.” We are going to discuss each letter of “TRIPSS” in detail.
2. “T” represents training. Training from the ATV Safety Institute or instructors certified to teach this course is recommended. The course includes classroom and riding instruction. Many crashes occur because the rider doesn’t know how to handle specific situations. What kinds of skills do you think should be taught in an ATV training course?
 - ☐ Rider mechanics –
 - Riding an ATV requires that the driver shifts his or her weight to maneuver the machine and maintain balance.
 - ☐ Navigating different terrains:
 - Hills.
 - Gravel.
 - Streams.
 - Mud.



Notes

Plan Your TRIPSS



Fast Facts

In Arkansas, 90% of students who use ATVs admit to riding as a passenger. 25% of youth admitted to Arkansas Children's Hospital for ATV-related injuries were a passenger at the time of the injury.⁵

"Clothesline" or garrote injuries refers to sever cuts to the throat or face, caused by riding into a wire, fixed line, tree limbs, or other barriers strung across trails or accesses.

Discussion (cont)

3. **"R" represents riding off road. ATVs are not designed to be ridden on paved streets, highways, and roads. They are designed and intended to be ridden off road. What design specifics make ATVs dangerous when ridden on pavement or roads?**
 - ☐ ATVs have low pressure tires designed for use on off-road terrain (ie: woods, trails, etc).
 - ☐ ATV tires grip too well on paved surfaces due to low pressure, making the top heavy machines highly unstable.
 - ☐ ATVs sit low to the ground so drivers of motor vehicles are not able to see them.
4. **"I" represents impairment. Like driving motor vehicles and boats, ATVs should not be used while under the influence of drugs, alcohol, prescription medication, or when excessively sleepy. Impairment alters the driver's hand-eye coordination, perception and judgment, and inhibitions that lead to unnecessary risks. How does the risk of riding an ATV while impaired differ from a motor vehicle?**
 - ☐ Unlike motor vehicles, ATVs do not have safety features in their engineering, such as seatbelts and airbags, to protect the rider in a crash.
 - ☐ ATVs are designed for single riders, making it unwise to have a designated driver.
5. **"P" represents plan ahead. This means that before you ride an ATV, you should scout the area for hazards. Also, you should let someone (a parent if the rider is a child or teen) know where you will be riding and when you expect to return home. What hazards should you look for in your riding area?**
 - ☐ Natural hazards:
 - Trees, including hanging tree branches over the trail.
 - Briars and shrubs.
 - Unstable rocks and loose gravel.
 - Water and muddy areas.
 - Steep hills.
 - ☐ Man-made hazards:
 - Fences (temporary/permanent), especially barbed wire.
 - Ditches.
 - Cattle gates.
 - Irrigation piping.
 - Road crossings and intersections.

Plan Your TRIPSS

Discussion (cont)

6. **The first “S” represents single rider. Most ATVs are not designed for passengers. Warning labels on ATVs will tell you whether or not the ATV is safe to carry passengers. What engineering designs make it unsafe to carry passengers?**

- ☐ ATVs are rider active machines –
 - Shifting of the driver’s weight actually helps to steer the ATV. Passengers change the machine’s balance.
- ☐ ATVs not designed for passengers do not have foot pegs or separate seating –
 - Feet can become entangled in the moving parts of an ATV.
 - Increased risk of being thrown from the ATV.
 - Feet can become entangled in objects on trail.

7. **The second “S” represents safety equipment. We have already discussed the importance of wearing a helmet. Most of the remaining safety gear is probably already in your closet. What are four pieces of safety gear a rider should always wear when riding an ATV and how do they protect from injury?**

- ☐ Gloves –
 - If the hand is struck by an object such as briars or limbs, the rider may let go of the handlebars.
 - Help to maintain grip on handlebars.
- ☐ Long pants and sleeves –
 - Protect the arms and legs from cuts due to road hazards, such as bushes.
 - Shield the body from more serious “road rash” if thrown off an ATV.
 - Protect the legs from serious burns if they come in contact with the hot engine.
- ☐ Goggles (if the helmet does not have a protective shield) –
 - Protect the eyes from dust and flying debris.
- ☐ Closed-toe shoes –
 - Protect the toe, foot, and ankle from a serious cut or break.



Fast Facts

Injury to the toes and foot areas in ATV crashes are usually quite severe and dirty. A recent study reported that 80% of the ATV related foot injuries resulted in some sort of partial foot amputation.¹¹

Notes

Plan Your TRIPSS

Notes



Discussion Summary

Key Messages:

- Everyone, even experienced riders, can benefit from ATV safety training or rider's course.
- ATVs are not designed for use on paved roads.
- ATVs are not designed for passengers.
- Do not ride an ATV alone without someone knowing your plans and route.
- Impairment increases the risk of an ATV crash, just as it does a motor vehicle crash.
- An ATV rider should be covered from head to toe every time they ride.

Transporting Your Gun Safely on an ATV

Learning Objectives (5 minutes)

After discussing this section participants will:

- Identify risks in carrying a gun on an ATV.
- Describe how to carry a gun safely on an ATV.

Note: This section may not be applicable to all audiences.

Discussion

1. What are the risks in carrying a loaded gun on an ATV?

- ☐ A loaded gun can discharge unexpectedly.
- ☐ If the gun is across the driver's lap, it is more than likely being held by one hand and leaves the driver with only one hand to steer the ATV.

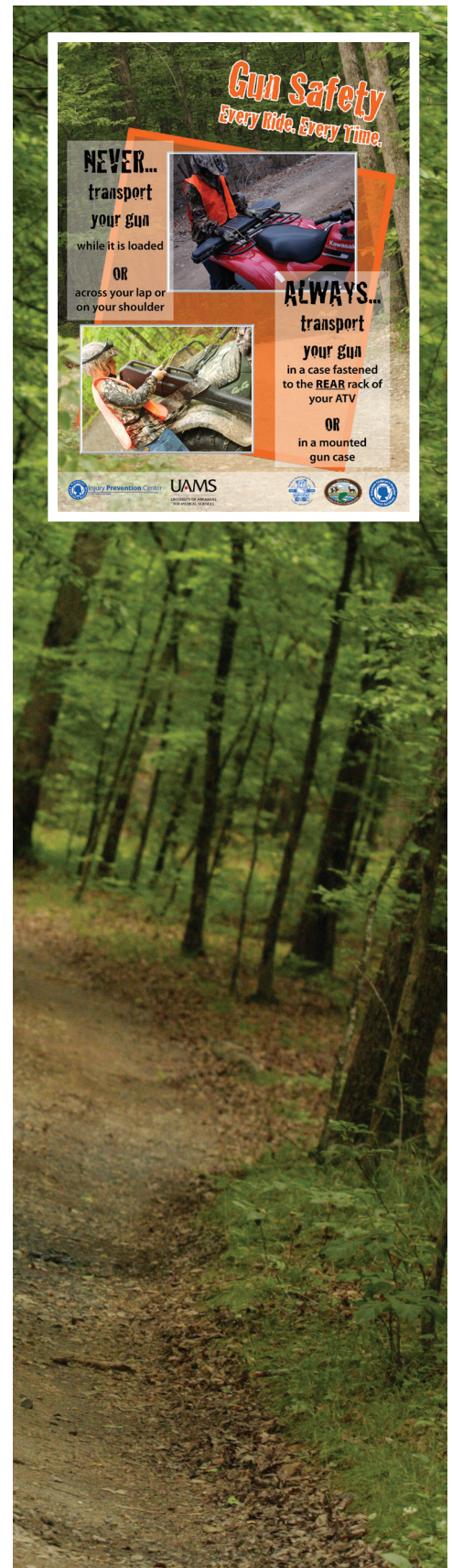
2. What are the recommendations for transporting a gun safely on an ATV?

- ☐ Carry the gun unloaded in a case that is either mounted to or securely fastened to the ATV.
- ☐ For the protection of both the ATV rider and the gun, it is recommended that the cased gun be secured to the rear luggage rack of the ATV.

Discussion Summary

Key Messages:

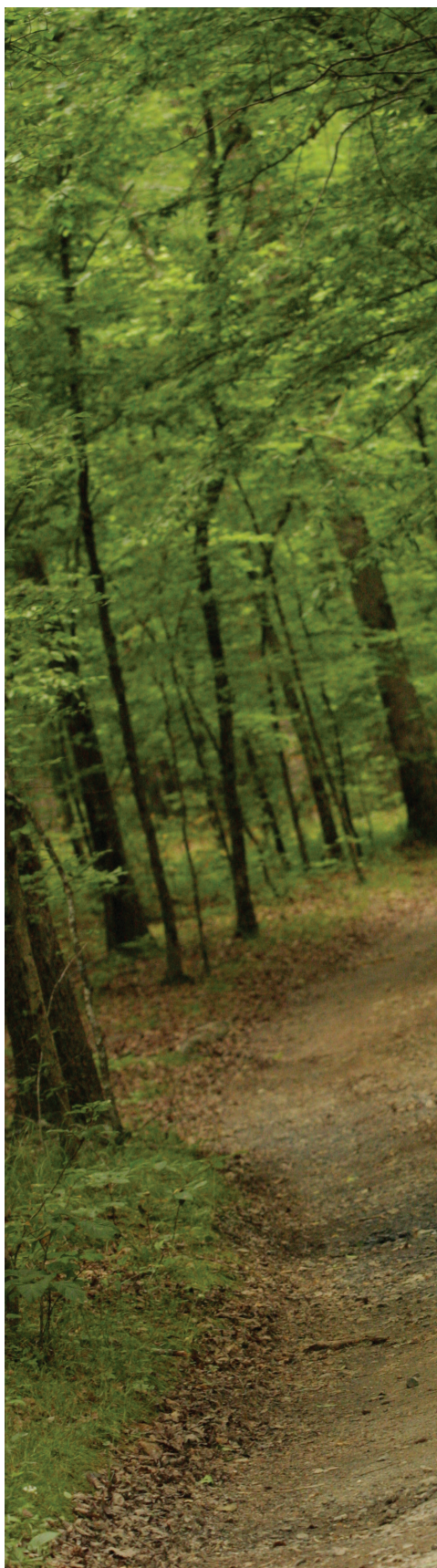
- There is no safe transport of a loaded gun on an ATV.
- An unloaded gun should be secured on the rear of an ATV in a case.



Classroom Lesson Plans

6-8th Grade Level

(English, Social Studies, Math, Science)



Learning Objective

After watching the DVD, “A Trip Unplanned,” students will apply critical writing skills in critiquing the video’s effectiveness in conveying accurate and compelling safety information.

Curriculum Frameworks

1. Oral and Visual Communications
 - a. Media Literacy
2. Writing
 - a. Purpose, Topics, Forms, and Audiences
 - b. Conventions
 - c. Craftsmanship
3. Inquiry/Researching
 - a. Research/Inquiry Process

Time

Length of video, approximately 20 minutes

Introduction to tasks, 5 minutes

Completion of task, 15 minutes

Summary and reporting, 10 minutes

Introduction

Critiques of movies and television shows are often used to generate interest among viewers or to dissuade viewers. Critiques can also be used to generate discussion on an issue that is relevant to the show’s plot, such as drug use and abuse or ethical situation. Using the following format frequently used in formal critiques, write your impression of the effectiveness of the video in increasing ATV safe riding habits.

Part 1

Information

Write a short paragraph including the name of the video, the two principal organizations that produced the video, and the year of release. Also include when and where you watched the film and any special comments regarding the quality of the video.

Part 2

The Plot

In no more than one good paragraph, retell the plot. Of course, you will not be able to give all the details. Condense the main story line to no more than five sentences.

Part 3

The Reality

The characters of this video were not based on real people. **Were these characters believable or not? In five sentences, give your opinion and examples to support your opinion.**

Part 4

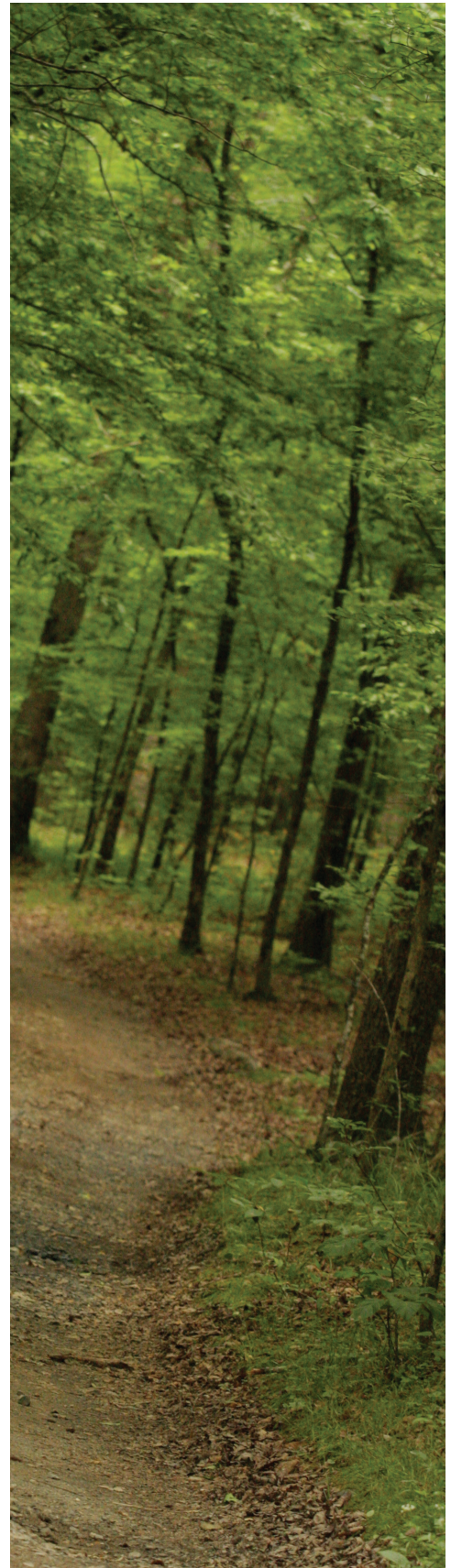
The Setting

In five sentences, identify the setting(s) of the video and describe your impressions of the setting. **Were locations of the video realistic? Were the houses, weapons, clothes, hairstyles, shoes, and roads shown with accuracy and in settings with which you can identify?**

Part 5

Evaluation

Give an evaluation of the film. Like a real film critic, point out the strengths and weaknesses of the movie. **Which actors did a good job and which were inadequate? Was the plot vague, too slow, or too fast? Were characters stereotyped roles or well-rounded characterizations? Did the story build to a logical conclusion, and did it hold your interest? What would have made the film better? Would you recommend the film to another student? Why?**



SOCIAL STUDIES



Learning Objective

After watching the DVD, "A Trip Unplanned," students will debate the merits of Arkansas' law regarding ATV use.

Curriculum Frameworks

1. Citizenship
 - a. Examine rights, responsibilities, privileges, and duties of citizens
2. Laws
 - a. Evaluate federal, state, and local laws.
 - b. Examine Arkansas' laws pertaining to students.

Time

Length of video, approximately 20 minutes

Introduction to tasks, 5 minutes

Completion of task, 10 minutes

Summary and reporting, 15 minutes

Introduction

Federal and state laws have been shown to be effective in improving the health of U.S. citizens. For example, states that have enacted and enforced laws requiring the use of helmets for motorcycle users have lower rates of death, serious head injuries that leave people permanently disabled, and lower health care costs associated with motorcycle crashes.

Divide students into five groups. Each group will have one aspect of the law to discuss and report back to the entire class. At the end of each reporting, remaining class members will have an opportunity to further discuss the points.

Group 1

According to Arkansas law, a person less than twelve (12) years of age shall be entitled to operate an all-terrain vehicle in Arkansas only if he or she is under the direct supervision of a person who is at least eighteen (18) years of age or if he or she is on land owned by, leased, rented, or under the direct control of his or her parent or legal guardian, or if he or she is on land with the permission of the owner. **Do you believe this law is realistic? Does the law apply to all riders of ATVs or just the drivers? How could the law be rewritten to be more specific? What would you suggest should be the minimum operator age for an ATV?**

Group 2

According to Arkansas law, conviction of violations of any provision of the state's ATV law shall be punished by a fine of not less than \$10.00 nor more than \$50.00, or imprisoned not more than 30 days, or shall be fined and imprisoned. **Are these punishments adequate to stop improper use of an ATV? Has anyone in your group known of someone who has been convicted of breaking the ATV law, and, if so, what was their punishment? Under what circumstance do you believe someone should serve jail time for an ATV conviction? What would be appropriate punishments for a violator under age 16?**

Group 3

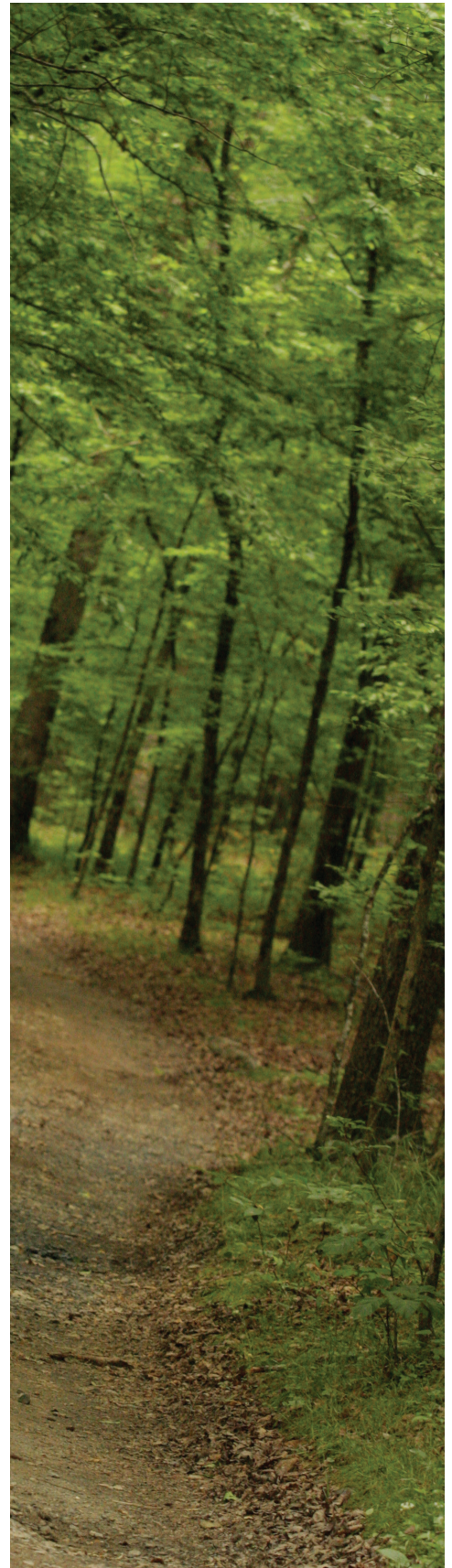
Arkansas law does not require the use of a helmet while riding an ATV, despite proof that helmets protect against traumatic brain injury that may result in life-long disabilities and death. **Some believe that helmet laws violate freedoms of personal choice. Do you believe such a law violates your personal right? Write a law that you believe would be fair to ATV riders.**

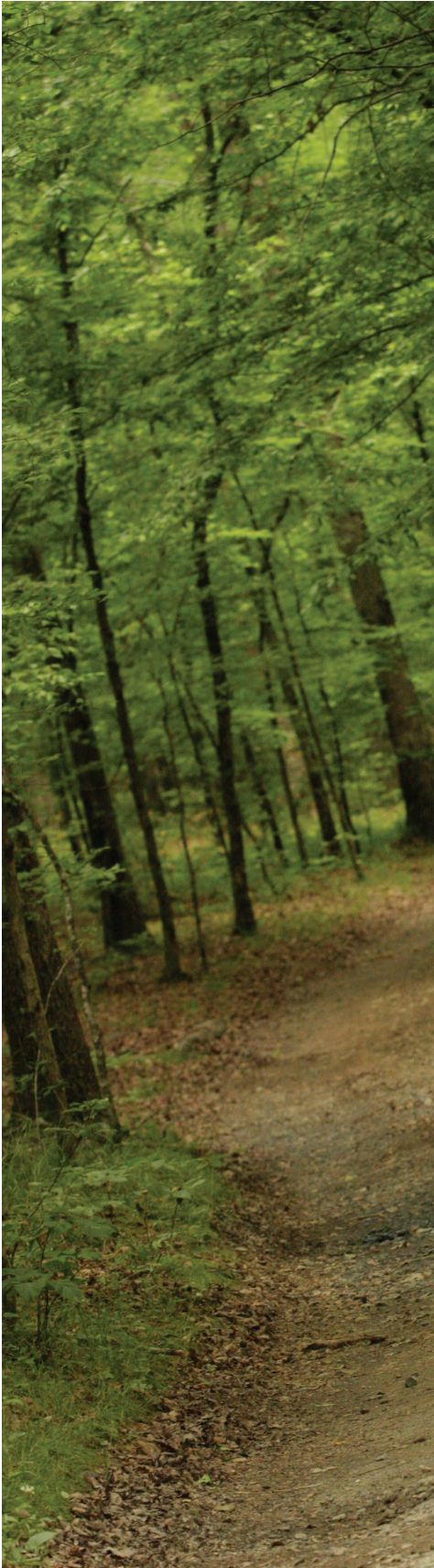
Group 4

According to Arkansas law, ATVs may not be used on public streets or highways, except to cross these roads or for farming or hunting to get from one field to another. **How often do you believe ATV riders in your community violate this law? Make a list of pros and cons to riding ATVs on streets and highways.**

Group 5

An ideal law would require a rider education certificate for use of an ATV. The most frequently used rider education course is by the ATV Safety Institute, offered at no cost by ATV dealers when the machine is purchased new. The courses are not provided regularly in Arkansas. **Do you know an ATV rider who has taken this course? What recommendations do you have for making this course readily available to all ATV users in the state? Should there be a cost to the course if you have not purchased a new ATV? Should completion of a rider education certificate be required for ATV license, much like a driver's license?**





Learning Objective

Students will quantify the burden of ATV-related injuries.

Curriculum Frameworks

1. Number and Operations
 - a. Compute fluently and make reasonable estimates

Time

Length of video, approximately 20 minutes

Introduction to tasks, 5 minutes

Completion of task, 15 minutes

Summary and reporting, 10 minutes

Introduction

Arkansas has one of the highest ATV-related injury rates in the nation. Surveillance, or tracking injuries in an objective manner, is an important function of ATV research. Over the past ten years, 600 children have been admitted to the Arkansas Children's Hospital Trauma Unit due to ATV-related injuries. These injuries are serious enough to require specialty care for injuries ranging from severe head trauma, spinal cord injuries, and amputations.

Activity 1 – Use Table 1 on page 26

What generalizations can be made from this data regarding who is most at risk for a serious ATV injury and at what times of the year? What factors do you think contribute to these risks? How do you believe a child age 0-4 years can be injured on an ATV?

Activity 2 – Use Table 2 on page 26

Following is a table of admissions by year over a 10-year period. What is the average admission per year to the ACH Trauma Unit? What is the mean admission over a ten year period? When you compare admissions in 1998 to admissions in 2008, what is the rate of increase? When you compare years with the lowest and highest admission rates, what is the rate of increase? What do you think has contributed to the increases in admissions?

Activity 3 – Use Table 3 on page 27

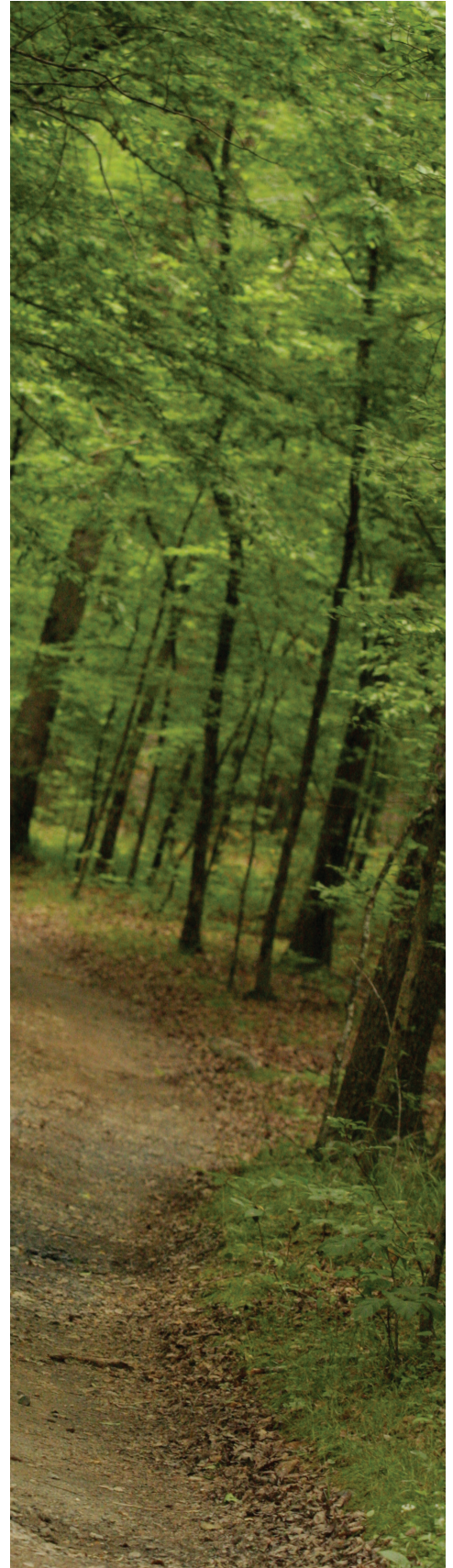
Following is a table of admissions identifying the patient's position on an ATV. What percent of positions are unknown? Based on this information, who is more likely to be a passenger – a male or female?

Activity 4

On average, there are 11 ATV-related deaths each year in Arkansas. Using this figure, how many Arkansans have died due to an ATV-related injury in the past 10 years?

Activity 5

From 1982-2004, 28% of ATV-related deaths in Arkansas were children under age 16. Using your estimate in Activity 4, how many children under age 16 were killed while riding ATVs?



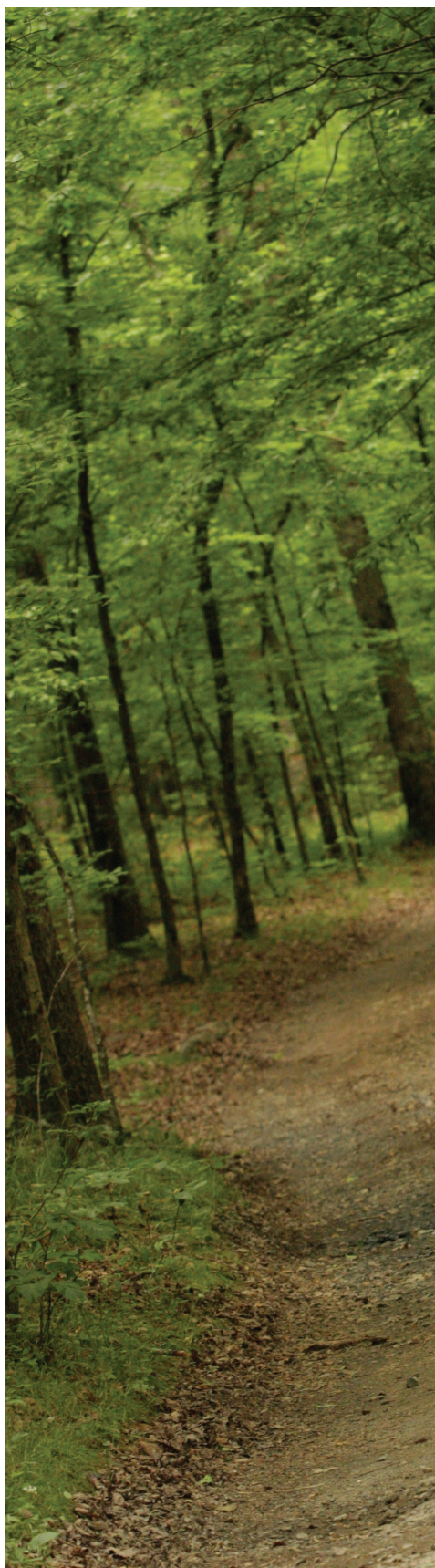


Table 1

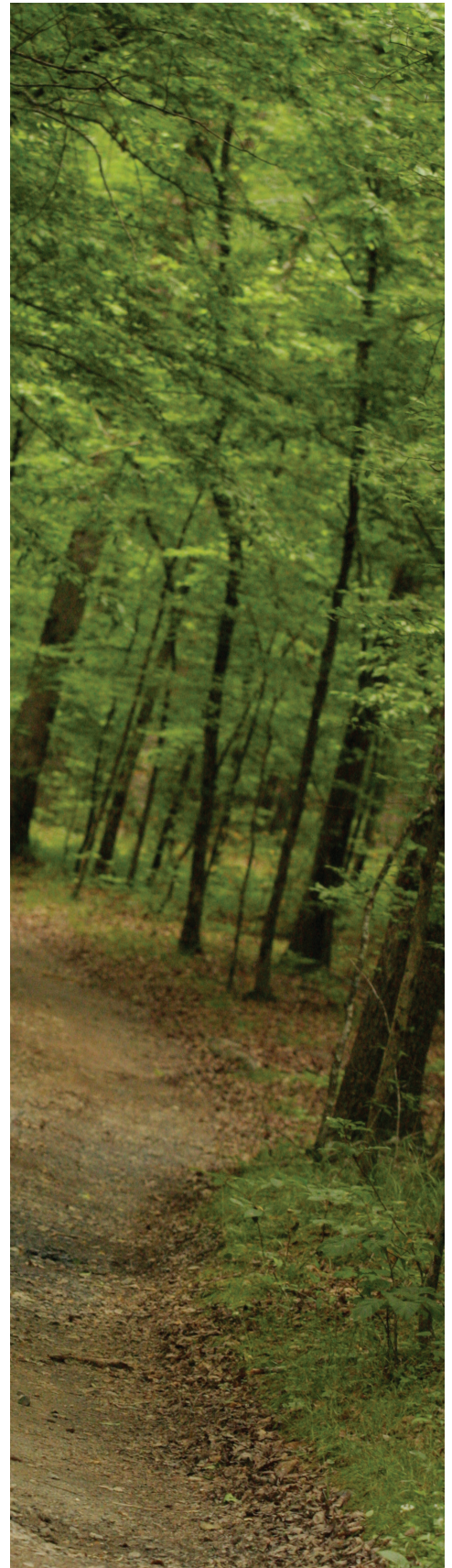
Month	Age					
	0 to 4	5 to 9	10 to 14	15 to 18	Over 19	
January	1	5	13	5	0	
February	2	2	17	8	0	
March	5	10	1	13	0	
April	8	9	26	7	0	
May	5	18	31	9	0	
June	7	10	25	14	0	
July	6	20	39	21	0	
August	8	10	31	26	0	
September	5	7	24	9	0	
October	7	15	24	9	1	
November	3	7	23	8	0	
December	1	9	13	6	0	
	58	122	284	135	1	600

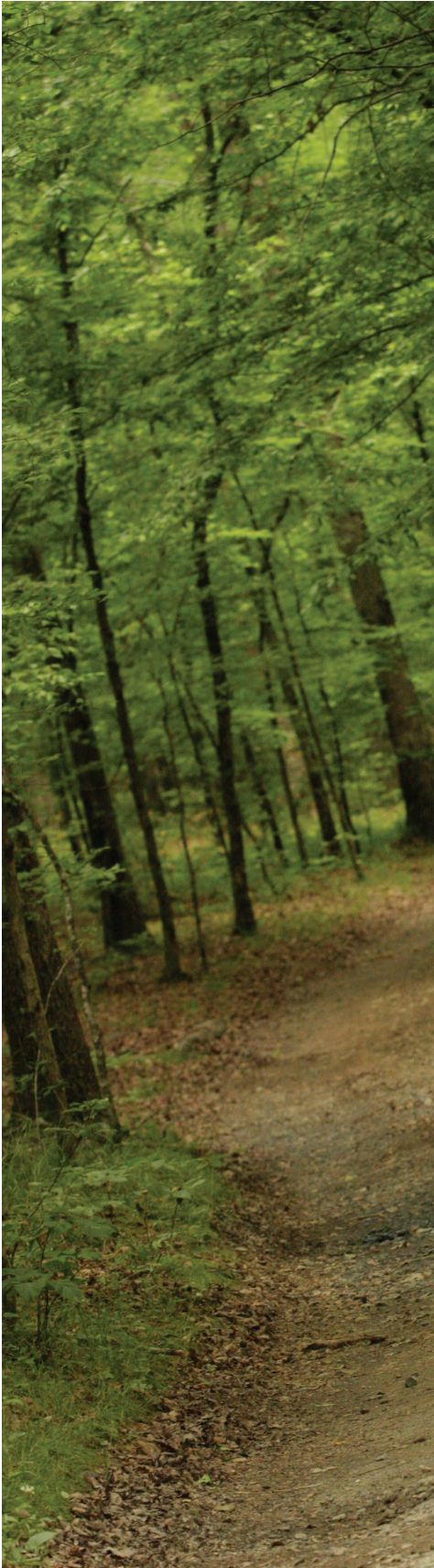
Table 2

Year	Total
1998	35
1999	33
2000	30
2001	46
2002	49
2003	66
2004	57
2005	64
2006	78
2007	74
2008	68
	600

Table 3

Position on ATV	Male	Female	
Driver	199	83	
Passenger	81	65	
Pedestrian	6	2	
Unknown	116	45	
Other	3	0	
	405	195	600





Learning Objective

Students will identify crash dynamics and potential resulting injuries of ATV riding.

Curriculum Frameworks

1. Energy and transfer of energy
 - a. Apply knowledge

Time

Length of video, approximately 20 minutes

Introduction to tasks, 5 minutes

Completion of task, 15 minutes

Summary and reporting, 10 minutes

Introduction

Injuries are caused by the transfer of energy to tissue. This results in exposure to thermal, mechanical, electrical, or chemical energy. Newton's First Law of Motion states that an object in motion remains in motion at the original speed until acted on by an outside force. That outside force can be harmful (e.g. a tree, the ground, the steering column of an ATV) or designed to protect (e.g. a helmet).

Activity 1

Three types of collisions occur in a crash: 1) the collision between the machine and an object, such as a tree or another vehicle; 2) the collision between humans and other objects; and 3) internal collisions whereby organs inside a person's body may hit other organs, bones, or even the inside of the skull.

The skull is hard and inflexible, while the brain is soft with the consistency of gelatin. Discuss scenarios of how a brain injury can occur as a result of an ATV crash. How do helmets protect the brain in the event of a crash?

Activity 2

Estimates are that four in every 10 ATV riders wear helmets. Surveys of students in an Arkansas county with high rates of ATV-related injuries found that as few as one in every 10 ATV riders wears a helmet. Students report that helmets can be hot and uncomfortable to wear. What engineering designs could be made that would make helmets more comfortable?

Activity 3

Two unique injuries to ATV riders have been identified by physicians at Arkansas Children's Hospital: 1) clothesline or garrote type injuries when riders encounter fences or barbed wire at high speed, resulting in strangulation or cutting of the jugular vein in the neck; and 2) amputations, particularly of the feet when young children ride vehicles that are too large to allow them to reach the vehicle floorboards, resulting in their feet becoming tangled in the moving parts of the ATV.

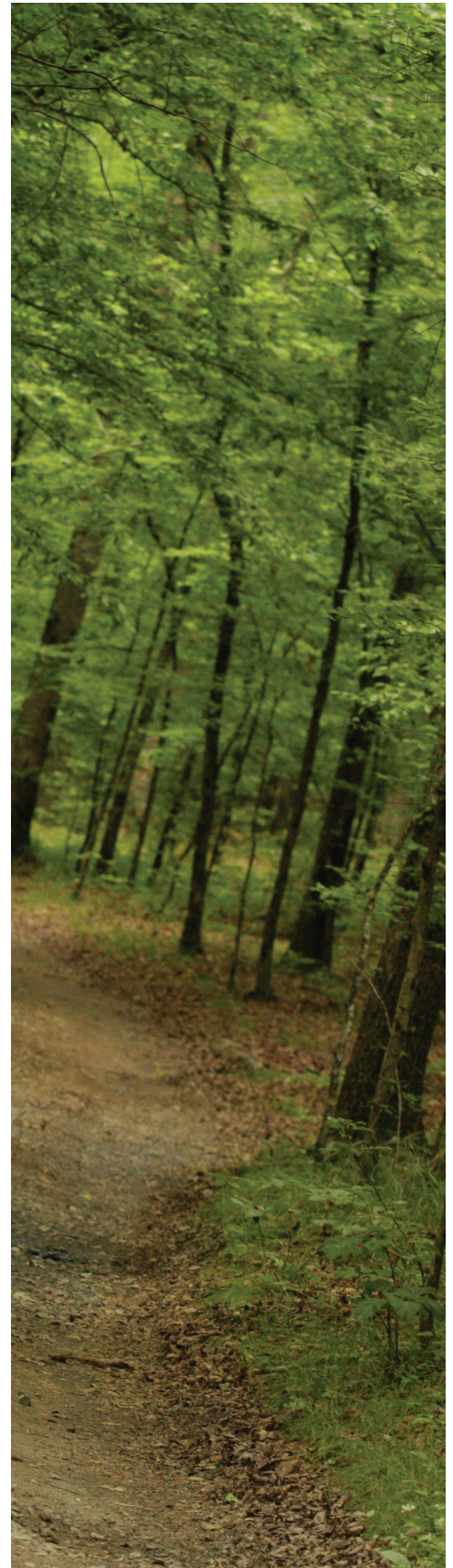
Presuming that you survived a severe clothesline injury this summer, how might your quality of life be compromised or changed? How might your daily routines of body functions and care be changed? How could this injury significantly change your future?

Imagine that you had your leg amputated at the foot or knee at the age of four due to an ATV crash. How would your life change as a result of this injury?

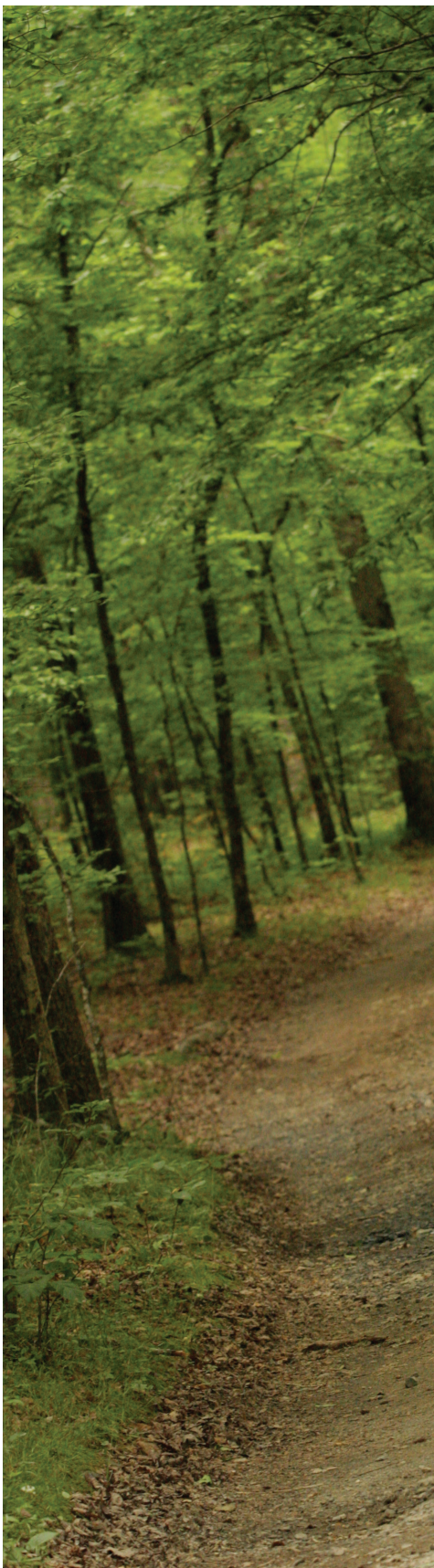
Activity 4

ATVs have engineering designs that increases the risk of serious injuries. Their narrow track width and high-ground clearance designed for travel on rough terrain makes them far less stable than a car or SUV. Also, riding with a passenger on a traditional ATV is dangerous. Adding a passenger throws the ATV's center off balance and raises the center of gravity, making it harder to control. Additionally, traditional ATVs lack grips and other accommodations to keep the passenger safe from ejection.

Discuss extenuating risks, such as alcohol impairment, wet weather, unstable terrain such as mud, and darkness and how they contribute to an inherently poor engineering design to increase risk of a crash or rollover.



SAMPLE ATV SAFETY WEEK TIMELINE/PLAN



Day 1

- ☐ Announce ATV Safety Week on the school's public announcement system.
- ☐ Place ATV safety posters from the tool kit on bulletin boards on the school property.
- ☐ Show "A Trip Unplanned" video on closed circuit television or in an assembly setting.
- ☐ English teachers use the lesson plan in the tool kit for the class assignment.

Day 2

- ☐ During announcements, remind students to view the ATV safety posters and read the messages for the first two letters on the "Plan Your TRIPSS" safety information.
- ☐ Math teachers use the lesson plan in the tool kit for the class assignment.

Day 3

- ☐ During announcements remind students to view the ATV safety posters read the messages for the second two letters on the "Plan Your TRIPSS" safety information.
- ☐ Social Studies teachers use the lesson plan in the tool kit for the class assignment.

Day 4

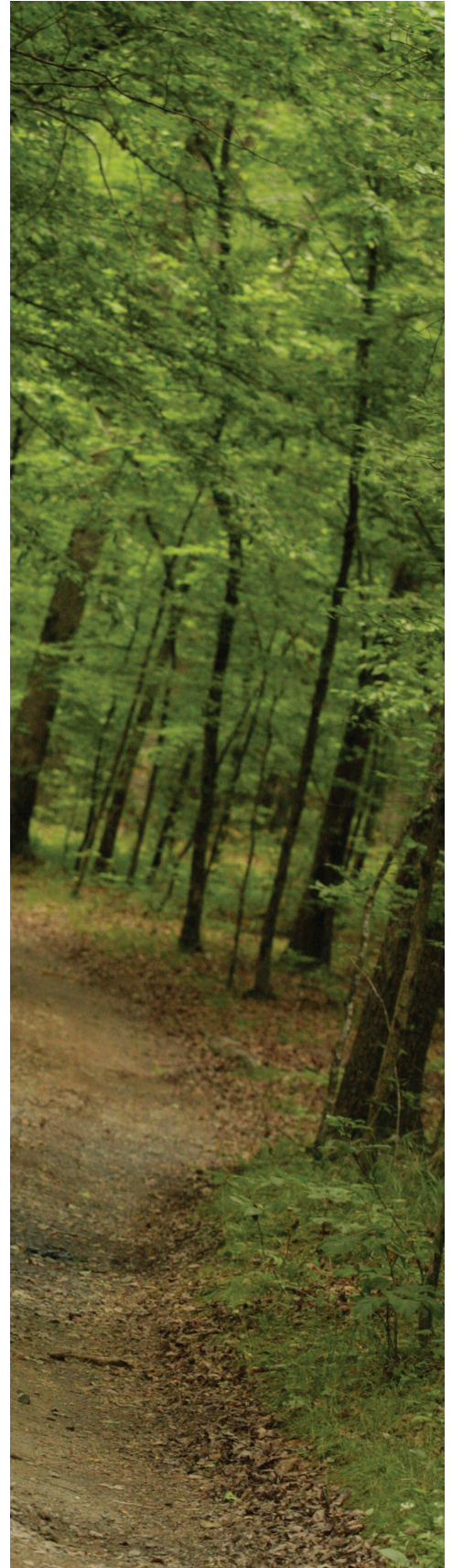
- ☐ During announcements, remind students to view the ATV safety posters and read the messages for the final two letters on the "Plan Your TRIPSS" safety information.
- ☐ Announce that community resources will be at the school on the following day to conduct an assembly and safe ATV driving exhibition.
- ☐ Science teachers use the lesson plan in the tool kit for the class assignment.

SAMPLE ATV SAFETY WEEK TIMELINE/PLAN

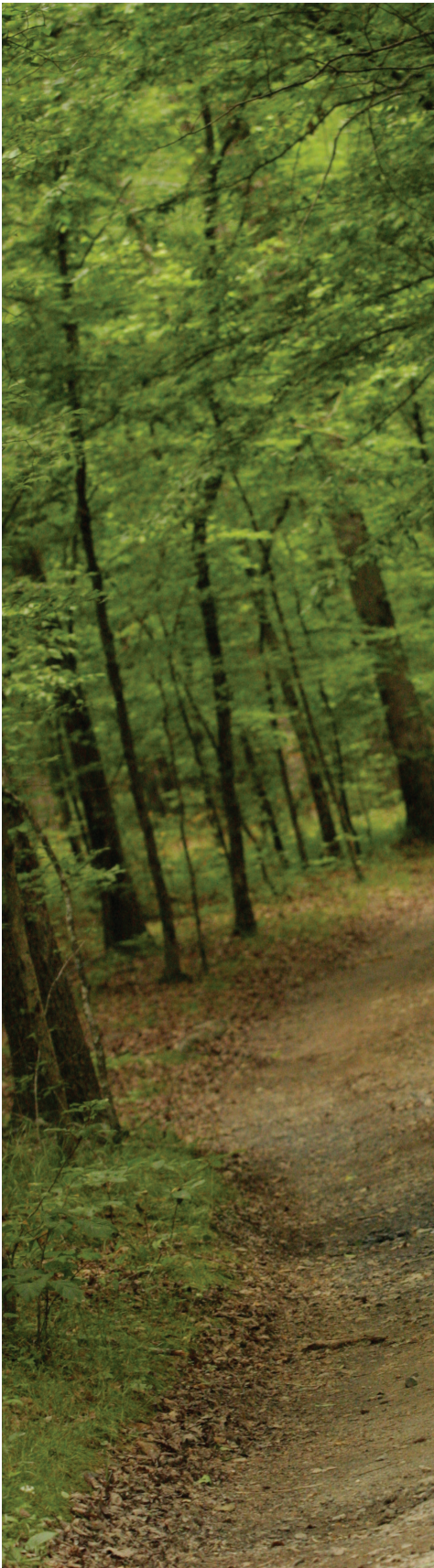
Day 5

Two 55-minute assemblies are conducted with half of the students in each group and rotating when completed.

- ☐ The first assembly is conducted by a doctor, nurse, or first responder to discuss injuries frequently caused by ATV crashes.
- ☐ The second assembly is an ATV safety exhibition conducted by a certified instructor by the ATV Safety Institute. This assembly demonstrates safe use of an ATV. It does not include allowing students to ride the ATV.
- ☐ Give each student a “take-home” brochure on ATV safety from the tool kit or a visual created by students.



Additional Resources



Arkansas Children's Hospital

Many of the materials in the tool kit are located in the Injury Prevention Center's ATV section, and they may be downloaded for use. Complete tool kits, individual copies of the video and visual aids, and technical assistance in conducting ATV safety in your community are also available from the center.

www.archildrens.org/injury_prevention • 866-611-3445

ATV Safety Institute

The ATV Safety Institute website offers online enrollment in ATV Rider Courses nationwide. The site also contains valuable ATV safety tips and media information.

www.atvsafety.org • 800-887-2887

4-H Community ATV Safety Program

The 4-H ATV Safety website provides access to state and national ATV safety resources, reports recent ATV safety news, and features games for kids. Also included is local contact information for 4-H programs that conduct ATV safety training courses.

www.atv-youth.org or [www.safety@fourhcouncil.edu](mailto:safety@fourhcouncil.edu) • 301-961-2801

United States Consumer Product Safety Commission

The website contains safety tips, national and state ATV data, and current ATV laws by state. The site also reports current news, helps find local training courses, and allows ATV injuries to be reported.

www.atvsafety.gov • 800-638-2772

National Children's Center for Rural and Agricultural Health and Safety

The website has a section that promotes safe use of ATVs on farms. The section highlights the main hazards of ATVs, recommends training, and gives instruction for those supervising ATV use.

<http://research.marshfieldclinic.org> • 888-924-7233

Concerned Families for ATV Safety

This organization was begun by three mothers who lost their children in ATV crashes. They have created a network of parents dedicated to the prevention of injuries and deaths associated with ATVs. Their website contains personal stories and avenues for action concerning ATV safety.

www.atvsafetynet.org

Children's Safety Network

The Children's Safety Network website features a section on ATVs that contains statistics, links to publications, presentations, and injury prevention methods.

www.childrenssafetynetwork.org

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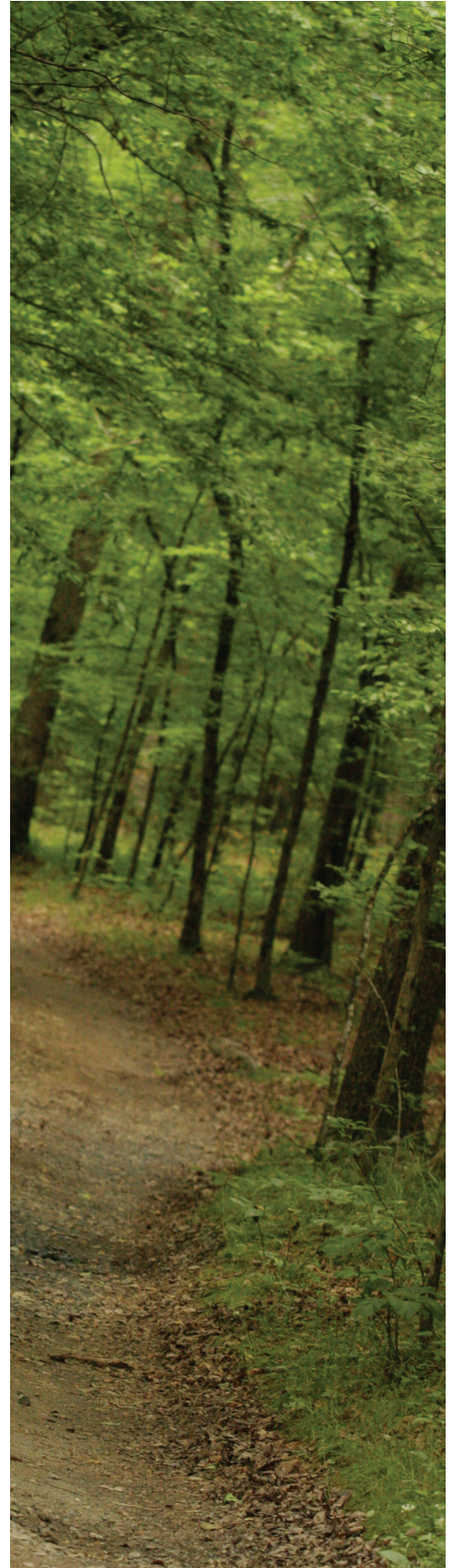
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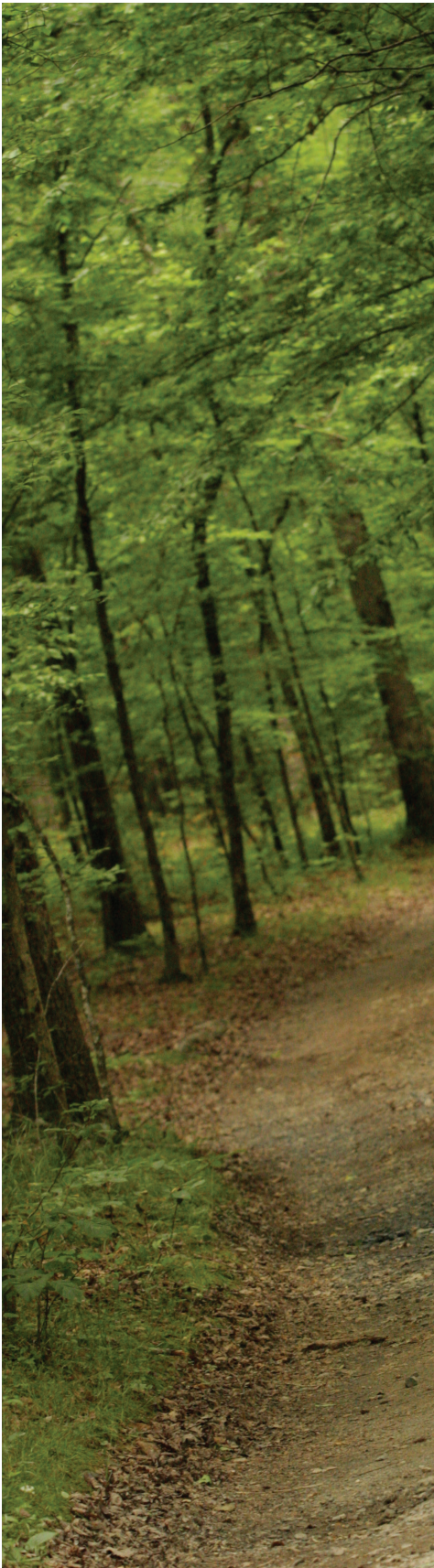
⁹ Unpublished data. Injury Prevention Center Arkansas Children's Hospital. 2006

¹⁰ Rodgers GB. The effectiveness of helmets in reducing all-terrain vehicle injuries and deaths. *Accident Analysis and Prevention*. 1990; Vol. 22(1): 47-58

¹¹ Thompson TM, Latch R, Parnell D, et al. Foot injuries associated with all-terrain vehicle use in children and adolescents. *Pediatric Emergency Care*. 2008; 24(7): 466-7



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Acknowledgements

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