

Risk Watch® Electrical Safety Lesson Plans

Grades 5-6

Understand the Science of Electricity

Lesson Plan: Jumpin' Jeopardy

Objectives

1. Review key messages of electrical safety in five areas:
 - Don't Blame the Cow!
 - Insulators
 - Conductors
 - Mr. Plug's Outdoor Electricity
 - First Aid
2. Download and print Jumpin' Jeopardy category cards, point cards, and the game questions.
3. Tape the cards on the chalkboard or whiteboard. Tape the category cards across the board followed by the point cards underneath.

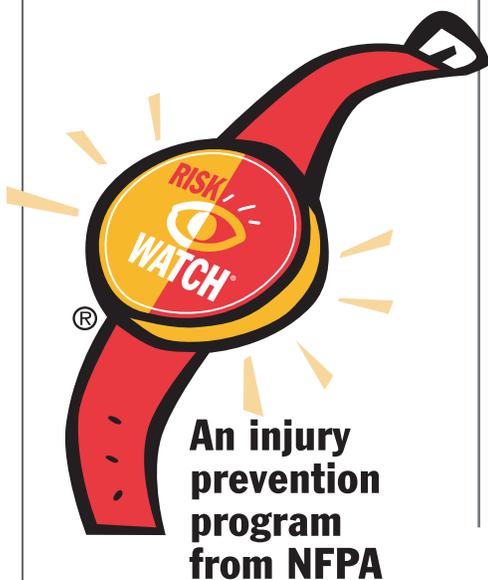
They may be laminated and placed with tape, Velcro or hooks, depending on time and resources.

Procedure

1. Divide the class into two teams: Team A and Team B.
2. Choose four students from each team as contestants.
3. Put each of the teams at individual tables – at the front of the room.
4. Put half the class members on the side of Team A, and the second half on Team B's side of the room.
5. Select a scorekeeper for each team.

Rules

1. Player #1 from Team A selects a category and point value (i.e. Don't Blame the Cow! for 400 points).
2. The host removes the card from the board and reads the question that coincides with the category and point requested.
3. If Player #1 answers the question correctly, the Team A scorekeeper records that number of points on a chalkboard, white board or paper score sheet.
4. If Player #1 misses the answer, Team B's Player #1 gets the chance to answer and win those points.
5. If Team B player is also unsuccessful, the question goes to the Team A audience members at half the point value.
6. If Team A audience is unsuccessful, Team B audience has the opportunity to answer.
7. If no one can answer the question, the host can share the answer. No points are awarded.
8. The game continues as the next player on Team B chooses a category and point value to play.
9. The game is over when all cards have been played and answers provided.



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Risk Watch® Electrical Safety Lesson Plans

Grades 5-6

Identify and work to eliminate electrical safety hazards in the home.

Lesson Plan: Mathtricity

Objectives

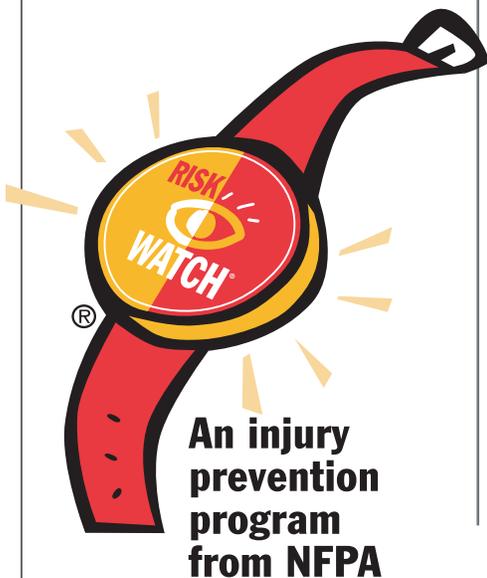
Solve electrical safety mathematics problems.

Preparation

1. Review *Electrical Information Guide*.
2. Copy worksheet for each student.

Procedure

1. Discuss with the class the importance of electrical safety. Review the *Electrical Information Guide*.
2. Read the scenario from Worksheet 1 to the students. Before handing out the worksheets brainstorm with the students. On a flip chart or chalkboard write student ideas for electrical items they might like to have in their game room.
3. Provide worksheets 1 and 2. Remind students they have \$2,000 to spend. Discuss what factors would come to mind when deciding what electrical items they might want or need in their game room.
4. After the students have solved the problems, go over answers together.



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Risk Watch® Electrical Safety Lesson Plans

Grades 5-6

Identify outdoor electrical safety hazards

Lesson Plan: Top Ten “Dumb Ways to Use Electricity”

Objectives

1. Name five items found outdoors that use electricity.
2. Describe what a pad mount transformer is and where it might be found.
3. Answer why it would be a bad idea to climb a power pole, even on a dare.
4. Name five outdoor items that could be conductors of electricity.

Preparation

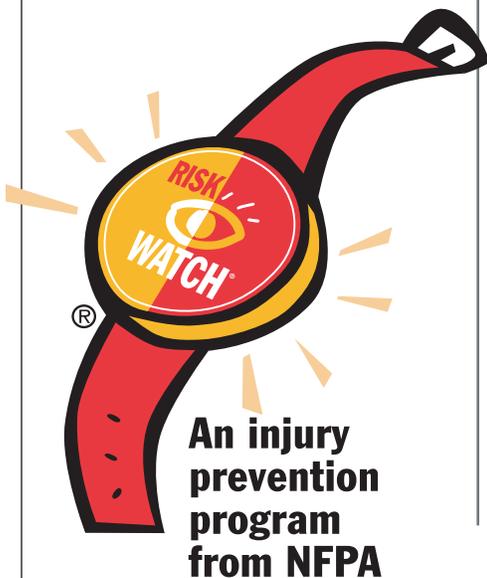
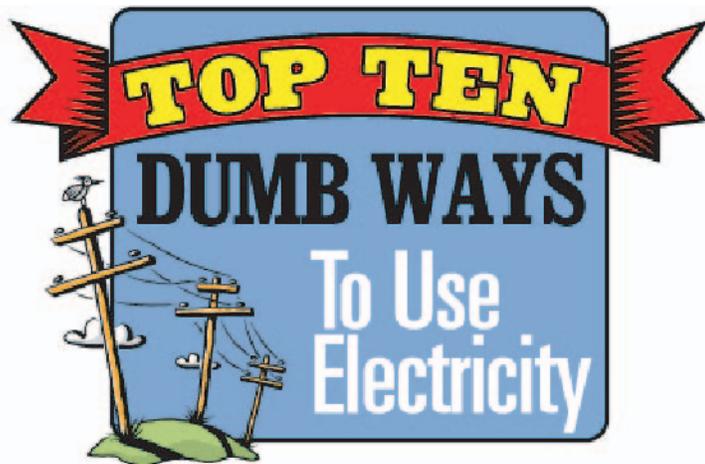
1. Identify appropriate samples of “Top Ten Lists” from *Late Night with David Letterman*.
2. Paper for creation of student lists.

Procedure

1. Discuss the use of the “Top Ten Lists” with the class.
2. Divide the class into groups of four or five.
3. Challenge the groups to brainstorm risky behavior based on the outdoor electrical safety key messages provided in the Electrical Information Guide.
4. Have the groups share their lists with the rest of the class.
5. Challenge the groups to come up with the ways to prevent outdoor electrical injuries from occurring.

Extensions

Create a kit for use when a storm knocks the power out, adapting the kit suggestions in the Electrical Information Guide.



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**Don't
Blame
the
Cow!**

Insulators and Conductors

Mr. Plug's

Outdoor

Electrical

Safety

**General
Electrical
Safety
Trivia**

First

Aid

100

200

O

O

3

400

O

O

G

Don't Blame the Cow!

- 100 Name two ways electrical fires occur.
Cords run under rugs where the insulation is broken by wear and tear and where they can overheat causing a fire.
Electrical cords are broken or cracked.
Electrical wall outlets are overloaded with too many plugs.
Check for outlets that emit sparks or smoke.
Small appliances are not turned off or unplugged after use.
- 200 Tell why you should only use electrical tools or appliances when hands are _____ or standing _____.
dry on dry ground
- 300 How would you know the proper wattage for a lamp's light bulb?
Match the description on the lamp with wattage on the bulb.
- 400 How many plugs should fit into a wall outlet?
One plug per socket: in most cases two per outlet.
- 500 Name 5 electrical safety tips for extension cords.
Extension cords are not intended for permanent use.
Store cords loosely coiled in a dry place.
Use properly rated cords for their *intended* use only.
Use indoor cords for indoors and outdoor rated cords outdoors.
Use the proper gauge or size for the demand of the appliance or tool.
Check the rating on the cord. It must be the same or higher than the number of watts used.
Holiday lights-need to be approved for outdoor use.
No more than three strands or extension cords connected.
Select the appropriate length.
Unwind cord before using.
Connect plugs completely.

Insulators and Conductors

- 100 What does an electrical insulator do?
It helps channel the electric current.
- 200 What does an electrical conductor do?
It helps provide the electric current a path to travel.
- 300 Name two materials that are electrical insulators.
Glass, rubber, plastics, dry wood, dry air.
- 400 What percent of the body is made up of water?

70 percent of the body is made up of water.

- 500 Name four materials that are electrical conductors.
Copper, aluminum, metals, water, human body, steel.

Mr. Plug's Outdoor Electrical Safety

- 100 What words would the sign on an electrical substation or transformer use to inform the public?
Danger - High Voltage
Danger - Do Not Enter
- 200 Name two electrical dangers outdoors and describe why they are dangerous.
Overhead power lines
Buried power lines
Pad mount transformers
Electrical substations
Transformers
Lightning
- 300 True or False
If a downed line is not sparking or humming, chances are it is not dangerous.
FALSE
- 400 Name four outdoor recreational items that adults and children use, that can be very dangerous if they connect with electrical power lines.
Kites, metal balloons, fishing poles, sailboat masts, parachutes.
- 500 Explain why metallic balloons should be kept indoors.
The metallic balloons are highly conductive. They can easily become caught in a transformer or power line and short out a system.

General Electrical Safety Trivia

- 100 When is National Electrical Safety Month?
May.
- 200 Tell what GFCI stands for and what it does.
Ground fault circuit interrupter. GFCIs can greatly reduce the risk of electric shock by immediately shutting off an electrical circuit when that circuit represents a shock hazard.

300 How many people died from unintentional electrocutions in the United States in 2000?

400, (CPSC).

400 Lightning travels as far as ___ miles and falls to earth _____ (how often)

40, every second of the day.

500 Lightning can generate temperatures as high as _____.

50,000 degrees Celsius.

First Aid

100 What type of fire extinguisher should be used on an electrical fire?

Multi-purpose, ABC extinguisher.

200 Someone near you has been electrically shocked. What should you do?

Move away, call 9-1-1, keep others away from the danger.

300 A power line has fallen and is touching the car you are in.

What should you do?

Stay in the car. If people move toward the car, motion for them to stay away. Call 9-1-1 for rescue.

400 If an electrical fire occurs in the home what should you do?

Get out, call 9-1-1.

500 How can birds sit on power lines and not get shocked?

Electricity always seeks a way to the ground. The birds on a wire don't represent a path to the ground, so the electricity flows right past their feet.

The birds don't provide a path to the ground, or to another energized conductor. When they do... THEY DIE! The fact that the only thing they are touching is the wire is what saves them. Usually, a person touching an overhead wire is also touching something else, such as pole. If they are only touching the wire, they will be fine. As a side note, utility workers often work on energized equipment, often with bare hands. This is because they are insulated from ground.

Mathtricity Go Watts!

Worksheet 1

Todd and Angie dreamed a crazy dream. In their dream, Great Grandpa Jenkins gave them \$2,000 to purchase *electrical* equipment and appliances to complete a teens' game room. Now they need your help.

1. Review the list of appliances and costs.
2. If you could have one of every item on the list, how much would it cost?
\$7,551.00
3. How many amps of electricity would flow if all items were turned on at once?
115 amps
4. Prioritize the entire list - starting with the items you would *most* like to own and moving to items you would *least* want.
5. Select your top favorite five items and add those prices together. What is the sum? Add together the wattage for each appliance. How many watts of current would be needed to make this an electrically safe game room?
6. How much more or less than \$2,000 did you spend using Question 5?
7. Create a list of items that cost up to, but not more than \$2,000.
8. If the entire room had electrical capacity of 20 amps, name five items that could be placed in the room without blowing a fuse.

Extension: Have students trade assignment papers and double-check each other's math.

Mathtricity

Worksheet 2

Below find a list of electrical appliances and items that could be found in a catalog. Use provided costs and amps as you answer these Mathtricity questions. (Note: amps and costs are estimations only.)

5- Disc CD Player/ Recorder
\$398.00 3 amps

Computer with laser printer
\$1,000 10 amps

Floor Speakers
\$99.00 4 amps

PlayStation 2®
\$199.00 7 amps

Wireless Headphones
\$89.00 1 amp

Electric Guitar
\$259.00 6 amps

47' Wide Screen Projection TV
\$2149.00 12 amps

Karaoke Machine
\$169.00 5 amps

Stereo Color TV
\$249.00 6 amps

Microphone
\$19.00 1 amp

Microwave
\$99.00 5 amps

Keyboard
\$329.00 8 amps

Cordless Phone/Answer Machine
\$119.00 1 amp

Personal CD Player
\$59.00 1 amp

Treadmill
\$399.00 8 amps

Facial Sauna
\$39.00 3 amps

Electric Dart Board
\$129.00 2 amps

Foot Spa
\$59.00 3 amps

Power Bowling Arcade
\$329.00 2 amps

5-aim arm accent light
\$99.00 4 amps

Air Hockey
\$169.00 2 amps

Table lamp
\$35.00 2 amps

Clock Radio
\$19.00 1 amp

2-Person Spa
\$999.00 15 amps

Popcorn Popper
\$39.00 3 amps

Electrical Information Guide

1. Understand the science of electricity.

Electricity is a powerful natural phenomenon, a form of energy and a basic feature of the universe's matter. Learning to respect the power of electricity is vital.

Today, many, many areas of human life depend on electrical energy. In the home, in the work place, for communications, transportation and for medical sciences: machines and appliances, subways and convey belts, motors and cranes, elevators and escalators all function to make life easier.

While electricity makes these and many other items run, there remain other fascinating characteristics of electricity to understand. Electricity is sent along overhead and underground power lines to get it where it is needed. Electricity is waiting in the wires of the house to be used. Electricity travels at the speed of light, 186,000 miles per second, making it impossible for a human to move from its path and power. That's why prevention and knowledge remain critical tools in the electrical safety tool chest.

Electricity continuously searches for the paths to the ground. Often electricity will take shortcuts off the path we intend for it to take. If an object that conducts electricity provides an easier path to the ground, the electricity will follow *that* path. It takes all paths to ground, probably most going by the path of least resistance.

Conductors

Conductors provide electricity as a means to travel. Metals and water are good conductors for electricity. Electricity locates a conductor, like water, metal, wet wood, or a human body and follows that conductor's path to the ground.

If a person touches an electrical wire or a faulty appliance, electricity will likely follow the shortcut path and pass through the person to the ground. As the electricity flows through the person, he or she may be seriously hurt or killed. Even if the person is not directly touching the ground, but is touching something in contact with the ground, like a tree or a ladder, that person can unintentionally become a conductor of electricity.

Because water is such an excellent conductor of electricity, electricity and water are not safe together. The human body contains 70% water. This explains why the body becomes an electrical conductor so readily. It is also why appliances,

electrical equipment, and tools must be kept away from bathtubs, puddles, sinks, and wet hands. People must be certain that their hands are dry and that they are not standing in water or on damp ground if touching anything electrical.

Water must never be used to extinguish an electrical fire because of its conductor capabilities. A multipurpose (ABC) fire extinguisher should be used instead.

Insulators

Insulators help keep electricity where it belongs. Glass, rubber, plastic, dry wood, and dry air make excellent insulators. Insulators are important for electrical safety because they keep the electricity from leaving the wires that electricity is meant to travel along.

Insulators make household cords safer to touch. Most cords are made from conducting materials covered with an insulating material such as rubber or plastic. Protective insulated cords and coverings help keep people safer from the electricity inside an appliance.

It is important to use appliances and cords in the way they were designed to help keep the interior electrical parts in tact. If a broken or a live wire inside a cord becomes exposed, a person touching the tool, toaster, or curling iron could easily come into contact with the electricity.

Current

No one invented electricity. People created inventions to harness the power of electricity. Scientists worked with electricity to develop light bulbs and batteries, and circuits and automatic defibrillators...Very simply, electrical current is a flow of electrical charge through a conductor. Hence, electricity is defined as the movement of charged particles. Electrical current is a form of energy associated with the movement of electrons and protons. While the current flows through an electrical device, energy can be converted to useful forms. For instance, electrical energy is used to heat the bread in a toaster and to create the light in a light bulb.

The electrical current that most people come into contact with harbors three hazards: shock, fire, and burns.

Electrical Fires

Electrical fires are different than other fires. Because water conducts electricity, putting water on an electrical fire can put more people in danger of electrocution, including those fighting the fire.

Electrical Fire Facts

- NEVER use water on an electrical fire.
- An adult should turn off the main power to the house.

- Call 9-1-1 and report an electrical fire.
- A multipurpose ABC fire extinguisher may be used to extinguish the fire.

Electrical Injury

The electricity in one 7.5-watt holiday tree bulb can kill a person in less than one second* if it passed through the chest (Data source: Electrical Safety at Home and Work” The Culver Company, Product 42110, run # 6048, 1996). Even if not fatal, electrical injury may cause serious falls, burns, cuts, or internal bleeding. The injury from that holiday light or a 12-watt electric shaver, a 75-watt bulb, or a 1,400- watt hair dryer could be fatal. Even when an appliance is turned off, but left plugged in, it can provide an injury. It is important to unplug an appliance when not in use and also before cleaning or working on it.

Electrical Burn

When a person is shocked, tissue along the path the electrical current takes through the body is burned. Burns occur anywhere along the path that the electricity takes, including areas on the skin where the current enters and leaves the body. Electricity is said to burn from the inside out. Tissue burned inside the body along the path continues to burn even after the current is stopped. While some electrical burns *look* minor, there still may be serious internal damage especially to the heart, muscles, or brain.

A number of factors define the outcome of an electrical injury to a person.

- The intensity of the voltage to which the person was exposed.
- The length of time exposed to the current.
- The route the current passed through the body.
- The speed and appropriateness of the delivered treatment.
- The victim’s state of health.

The symptoms of electrical injury may include:

Skin burns
 Numbness, tingling
 Weakness
 Muscle contractions
 Muscular pain
 Bone fractures
 Headache
 Hearing impairment
 Seizures
 Heart arrhythmia
 Cardiac arrest
 Respiratory failure
 Unconsciousness

The most serious cases involve loss of life and loss of limbs.

First Aid in Electrical Emergency Situations

1. Call 9-1-1 for medical and rescue assistance.
2. Shut off the electrical current, if safely possible. This could mean unplugging a cord, removing a fuse from the fuse box, or turning off a circuit breaker. Often simply turning off the appliance will not stop the flow of electricity.
3. If the current can't be turned off, wait for help to arrive. Stand back. If there is no help around, a non-conducting object like a broom or a chair could be used to push the victim away from the source of the current. It's best just to wait for help, however, to avoid adding yourself as another victim.
4. Once removed from the electrical current, if the victim is faint, pale, or shows signs of shock, lay him/her with the head slightly lower than the main part of the body and feet elevated. Cover the person with a warm blanket and wait for help to arrive. Provide no food or water.

Stay vigilant. Respect the power of electricity.

Electricity is a phenomenal and powerful performer.

It is also disfiguring, disabling, and deadly.

In most cases, electrical injuries can be foreseen and avoided.

2. Identify and work to eliminate electrical safety hazards in the home.

The best way to keep the home safe from electrical hazards is to take good care of appliances and to use all electrical equipment with care. While May is National Electrical Safety Month, respect for electricity and the power it provides must occur every day throughout the year.

According to the U.S. Consumer Product Safety Commission (CPSC), 400 total unintentional electrocutions occurred in the United States in 2000. Of these incidents, 150 were related to consumer products. Of those, 10 from household wiring; 17 related to small appliances; 29 related to large appliances; 15 related to power tools; 22 ladders; 3 garden or farm equipment; 12 lighting and 2 related to antennas. Seventeen electrocutions involved miscellaneous items such as unspecified appliances, pipes, poles, fences, chains, and flying toys (Data source: Electrical Safety Foundation International, ESFi).

According to the National Fire Protection Association's (NFPA) statistics for 1999-2001, electrical distribution equipment, including wiring, outlets, and lighting were involved in an estimated average of 35,000, or 9%, of the reported home fires per year. These fires caused an estimated average of 280 civilian fire deaths, 1,090 civilian injuries, and \$744 million in direct property damage.

Electrical problems can be a factor in fires started by appliances and other products powered by electricity. Electrical problems, including short circuits, ground faults and overloads, were contributing factors in roughly one in every five reported home fires, including those started by electrical distribution equipment.

According to Electrical Safety Foundation International (ESFi) an estimated 910 lives are lost, nearly 7,000 people injured, and nearly \$1.7 billion in property damage and loss due to fires started by equipment powered by electricity.

According to Carol Scott, burn nurse at Shriners Hospital in Boston, they see more electrical injuries from the international population than from the United States. (There are more people living abroad than in the United States. We don't know the risk.) In a continued effort to lower the number of deaths and injuries caused by electricity across the world, it is important to recognize the major causes of electrocutions and electric fires and then work to eliminate these hazards, before more lives are affected.

Most electrical devices have safety features to help prevent shock. Many appliances and tools have plugs with a third prong that connects the metal parts of the device to a wire leading to the ground. If the wiring inside the device becomes defective the third prong can carry any stray current safely to the ground.

The large box-like device found on the end of some appliance cords like that of hair dryers could be an appliance leakage circuit interrupter (ALCI) an immersion detection circuit interrupter (IDCI) or a ground-fault-circuit-interrupter (GFCI). These three-circuit interrupters protect people from unintentional electrocution and shock by immediately shutting off the power to the appliance when an electrical “leak” of current occurs.

A polarized plug has one narrow and one wide prong. The plug can only be inserted into a socket one way. This ensures the proper flow of electric current and lowers any chance of shock.

Make sure electrical items are certified by an independent testing lab such as UL, FM, CSA, or ETL. This ensures that the items have been tested for safe use.

Is Your Home **S** (afe)
 A (nd)
 F (ree) from
 E (lectrical dangers)?

Check to see how SAFE your home rates.

Electrical cords are in good condition.

- Check electrical cords for frays or nicks indicating excessive wear.
- Check that plugs fit snugly into sockets.

Electrical wall outlets are not overloaded with too many plugs.

- Check 1:1 ratio: one plug to each socket.
- Check for flickering lights, even after bulbs replaced.
- Check for outlets that emit sparks or smoke. Check that outlets and the wall immediately surrounding them are not discolored due to heat build-up.

Electric appliances are away from water sources.

- Check bathrooms, kitchens, and garages.

Electrical cords are placed where they will not become a tripping hazard, but not run under rugs, where they can overheat to cause a fire.

Electrical appliances with loose plugs and prongs are replaced.

Small appliances are turned off and unplugged after use.

Safety caps are placed in outlets to protect young children.

Extension cords are not in continuous use. When using an extension cord, follow these instructions.

- Unplug and safely store extension cords after every use
- Store cords loosely coiled in a dry place.
- Use properly rated cords for their *intended* use only.
Indoor vs. outdoor use
Proper gauge or size for the demand of the appliance or tool
- Check the rating on the cord. It must be the same or higher than the number of watts used.
- Select appropriate length.
Over 100 feet, power begins to be lost.
- Unwind cord before using.
- Connect plugs completely.
Push plugs all the way into outlet socket.
Never “daisy-chain” cords connecting multiple sets together for more length.
- Use the proper wattage light bulbs in light fixtures and lamps.
- Pull on the plug head, never on the cord.
- Never carry an appliance by its cord.
- Turn off and request that grown-ups repair or safely dispose of appliances that sputter, stall, or give slight shocks.
- Keep anything that will burn away from light bulbs or portable heaters.
- Use electrical tools or appliances only when hands are dry and when standing on dry ground. Standing in water or on a damp floor while using electrical appliances can be very dangerous.
- Check and remind adults to replace overheating cords and wall plates.
Notify an adult when you find an overheating cord or wall plate. They should be checked for problems and repairs or replacements made immediately.
- When disposing of damaged or defective cords or appliances, cut the cord to help ensure no one else “salvages” it and takes the hazard home with them.

Ground-fault-circuit-interrupters (GFCIs)

A ground fault occurs when electricity travels outside an intended path to get to ground, because of a frayed wire or faulty device. The current is leaking somewhere and electricity is escaping to the ground. If a person's body provides a path to the ground for this leakage, s/he could be injured, burned, or electrocuted. Ground-fault-circuit-interrupters (GFCIs) protect people from this.

Make certain GFCIs cover each circuit near a water source. GFCIs are located in outlets and circuit breaker panels. GFCIs are inexpensive electrical devices that can monitor electrical circuits to prevent electrocution, burns, and shocks. The GFCI will cut the power if it detects that the current is leaking off the circuit and may be traveling through the person (Data source: Electrical Safety Foundation International, ESFi).

GFCI protection should be found in bathrooms and garages, near kitchen sinks and outdoors.

Test smoke alarms and GFCIs monthly.

To test a GFCI:

GFCIs should be tested monthly to be certain they are working properly.

To test the GFCI, plug a light or nightlight into the outlet. The light should be on. Press the "TEST" button on the GFCI. The GFCI's RESET button should pop out and the light should go out.

If the light does not go out, the GFCI is defective or has been improperly wired. Contact an electrician to repair or replace the GFCI.

If the RESET button does not pop out, the GFCI is defective and should be replaced.

If the GFCI is functioning correctly and the lamp goes out, press the RESET button to restore the power to the outlet.

Arc-fault circuit-interrupters (AFCIs)

AFCIs are electrical safety devices designed to prevent fires caused by dangerous electrical arcs. When an electrical switch is opened or closed, an arc,

or discharge of electricity across a circuit, occurs. Unintentional arcs can occur at loose connections or where wires or cords have been damaged. Such arcs can lead to high temperatures and sparking, possibly igniting combustibles. AFCIs protect against fire by continuously monitoring the electrical current in a circuit and shutting off the circuit when unintended arcing occurs. These devices are designed to discriminate between unintended arcing and the type of arcing that occurs when a switch is operated.

Electricity is measured in volts, amps, and watts.

Volts measure the electrical potential.

- Volume of water.

Amps measure the *amount* of electrical current.

- Rate at which water flows through pipe.

Watts measure the amount of work done by a certain amount of current at a certain voltage.

- Work done by flow of water (water wheel, erosion) or wind, air movement (kite flying or buildings being ripped apart).

Volts x Amps = Watts

3. Identify outdoor electrical safety hazards.

A number of electrical safety hazards can be found outdoors. Children don't always recognize the dangers. It is important to remind them of the hazards, making them aware of the warning signs.

Recognize "Danger—High Voltage" signs

Many locations post warning signs telling of impending danger. Children must recognize and obey the "*Danger-High Voltage-Do Not Enter*" signs. Warning signs should be posted at substations and beside transformers to alert children these are not areas to play in or around. Substations and transformers contain dangerous electrical components.

Overhead power lines have no insulation. Carrying sometimes over 500,000 volts of electricity, there is no question what has more power, a child shimmying up the pole to reach a kite, or that power line over head. Underground power lines are insulated, but a sharp shovel will quickly break through that insulation and create a dangerous hazard.

- Stay away from overhead or buried power lines.
- Stay away from power lines, substations and pad-mounted transformers. If a downed power line is found - stay away and tell an adult immediately. Even if the line is not sparking or humming, fallen lines can kill if touched. The line may also energize the nearby ground and water creating a greater hazard.

Recognizing Outdoor Electrical Danger

- Many electrical dangers do not have physical warning signs, but quick wit and keen eyes will help to keep everyone safer.
- Electricity will travel through the string of a kite or a balloon caught in an overhead power line potentially causing shock or fire.
- Metallic balloons are highly conductive. Keep these toys indoors.

Outdoor Recreation Toys and Tools

Kites	Always fly kites away from overhead lines. Always use non-metal string or cord to fly kites. Never use metal in the construction of a kite.
Model airplanes	Always fly model airplanes away from overhead lines. Always use non-metal string or cord to fly model airplanes.
Fishing poles	Be aware of power lines around.
Parade flag poles	Be aware of overhead power lines.

Sailboat masts	Be aware of upcoming power lines. Be cautious around docks.
Hang gliders	Be aware of surrounding and upcoming power lines.
Parachutes	Be aware of surroundings and upcoming power lines.

Keep the *Electrical Safety Eye* on grown-ups while they are outside

Realize that a tree trimmer, a metal ladder, or other object can extend past a grown-up's reach and too close to overhead power lines.

Do It Yourself Dangers

Keep an eye on grown-ups:

- Using a ladder
- Trimming a tree
- Cleaning a pool
- Digging in the yard
- Carrying long tools or pipes
- Working on a roof

Remind grown-ups if something seems unsafe.

Stay clear of their work area.

Lightning

Lightning will strike. However, people may be protected from most of lightning's effects by using common sense during storms.

Lightning kills nearly 100 people each year in the United States. It injures hundreds more. It may travel as far as 40 miles. Each second of the day it falls somewhere on earth. Lightning can generate temperatures as high as 50,000 degrees Celsius. It can, and does strike in the same place twice.

A direct lightning strike to a human generally results in severe burns, a heart attack or no breathing. Prompt resuscitation may result in revival, but there may be other critical injuries.

Lightning zigzags from the clouds to the ground using the closest conductor. Generally this conductor will be the tallest object around. The word *tallest*, however, is a relative term. A tall object could be the Sears Tower, a shed out on the farm, or a child standing on the soccer field. Lightning may strike any object in its path and may reach those nearby a strike through the ground or the water.

Conducted current from a lightning flash may range from a minor or a tingling shock to a massive current diverted from a nearby power pole. When lightning is

nearby, find shelter immediately. If unable to find a building or home for safety, follow the guidelines suggested by the Lightning Protection Institute.

If caught outdoors unprotected...

- Get in a hard-topped car.
- Spread out and away from others - Don't stand in a crowd of people.
- Move away from metal objects including bikes, fencing and machinery.
- Get out of and move away from pools, lakes, and other water bodies.
- Move away from trees.
- Seek areas of land that are lower than the surrounding landscape.
- If a tingling sensation is felt, or the hair stands on end, lightning may be about to strike. Immediately crouch low to the ground on the balls of the feet and cover the ears. Do not lie down, or place your hands on the ground.
- Return to activities no sooner than 30 minutes after the last sound of thunder or flash of lightning.

For more information on lightning safety, visit
<http://www.lightning.org/awareness.htm>

How is it that birds...

Question: How can birds sit on power lines and not get shocked?

Answer: Electricity always seeks a way to the ground. Birds on wires do not represent part of a path to the ground so the Electricity flows right past their feet.

What to do if...

Electrical fires

- Get out.
- Notify 9-1-1 or tell an adult. Tell the dispatcher it is an electrical fire.
- Stay away.

Electrical shock

- Do not touch anyone or thing you think might have been electrically shocked. S/he may still be in contact with the electricity.
- Call 9-1-1 or tell an adult. Tell the dispatcher this involves electricity.
- Keep other people away from the continued danger.
- Understand that electrical shock may cause internal injuries. The person needs to be seen by a doctor, even if you don't see any burn marks.

Downed power lines

- Move quickly away even if you do not see sparks.
- Call 9-1-1
- Stay away from anything that might touch the wire: a fence, a tree, a building, a car.
- Wait for help.

Power line touching the car you are in

- Stay in the car.
- If people move toward the vehicle, motion for them to stay away. Have someone call 9-1-1 for help.
- Stay in the car until help arrives.

Power outages

Build a kit to help be more comfortable in the event of a power outage.

Basics might include:

- Flashlights for each member of the household
- Radio, battery powered

- Batteries for each item
- Canned food and can opener
- Prepackaged foods
- Bottled water for drinking and cleaning
- First aid kit
- Essential medications
- Toilet items
- Books and games to pass the time