Electrical Safety

Electricity can be a friend, but it can also hurt if you do not treat it with respect. Everyday someone loses his or her home or business due to an electrical fire. These tragedies are preventable. Don't be a victim of an electrical accident - practice electrical safety in the home, school and workplace. The following information may save a life!

Plugs
Everyone knows what a plug is. But do you know how a plug works? You should, because, according to the Consumer Product Safety Commission (CPSC), plugs and cords are involved in about 32% of all home electrical wiring systems fires each year.

Inside the body of the plug, the cord's wires are fastened to blades to enable electric power to pass to the cord from the receptacle outlet. The typical plug includes two blades or prongs, a molded plastic body holding the two blades apart and a blade/cord connection within the plug body. When inserted into an outlet, the blades become energized. Electricity flows through the blades, through the blade/cord connection and through the cord, thus energizing the appliance.

What are the different types of plugs?
Three-prong plugs include a ground pin that connects exposed metal parts of an appliance to the residential wiring system ground. Two-prong plugs do not have a grounding pin. Two-prong plugs are properly used on some appliances, such as "double-insulated" power tools that do not rely on grounding to provide protection from shock.

If you are using a three-prong plug in a room with two-conductor outlets, do not cut off the ground pin. Removing this pin could lead to electrical shock.
Plugs also come in "polarized" and "non-polarized" varieties. Polarization helps reduce the potential for shock. Consumers can easily identify polarized plugs; one blade is wider than the other. (Three-conductor plugs are automatically polarized because they can only be inserted one way.)

Older homes may not have polarized receptacle outlets. If not, the receptacles will not accept polarized plugs. A qualified electrician should replace the old receptacles and put in wiring consistent with polarization. Do not risk injury by modifying or forcing polarized plug blades to fit into a non-polarized outlet.

Extension Cords
Extension cords are often used in homes and offices. They offer convenience and are easy to use on a temporary basis. But if used improperly or carelessly, extension cords can be dangerous. The CPSC estimates that approximately 12,000 persons were treated in hospital emergency rooms for electrical burns and shocks, and about 2,500 persons were treated for injuries associated with extension cords.

What are some potential hazards involving extension cords?
Be on the look out for overloaded, worn, or damaged cords. Don't cover cords with carpets, furniture or appliances. Replace older cords that are non-polarized and that don't have safety closures. Cords without these safety closures can expose young children to shock hazards and mouth burn injuries. Extension cords are intended only for temporary use and not as a permanent substitute for inadequate house wiring. Keep cords out of the reach of children and out of high traffic areas where people might trip over them. Only use extension cords that have been tested by a nationally recognized testing laboratory, such as CSA, ITS, or UL.

How do I know what size or type of cord to use?
Make sure the total number of watts connected to the extension cord is no more than the cord rating. Replace overloaded cords with cords of the proper rating or relocate appliances to other outlets. Extension cords used outdoors should be specifically marked for such use. Indoor-use-only cords will not withstand outdoor conditions and cold result in a shock hazard. When using three-prong plugs, use only the proper grounding type of extension cord (one with three prongs). Polarized electrical plugs

(one blade is wider than the other) should be used only with polarized or grounding type extension cords. Never remove the third prong or cut down the blade of a plug to fit a non-polarized receptacle. Use special heavy-duty extension cords with high-wattage appliances.

Receptacles and Switches
The switch is the point where two worlds meet - human and electrical. Switches are used to turn power on and off. Receptacles are outlets, usually mounted on a wall or in the floor, that supply electricity to appliances through a cord and plug.
According to the CPSC, in 1996 (the most recent year for which data is available), there were about 4,700 electrical switch and receptacle fires. Such fires account for about 10% of the total number of electrical distribution system fires for that period.
What are some safety precautions to take with switches and receptacles?
All switches and outlets should be checked periodically to make sure they are not hot to the touch. If switches and outlets don't work properly, are hot to the touch, spark or arc when used, or if the switch or outlet blows a fuse or trips a circuit breaker, this could indicate an unsafe wiring condition. Have an electrician check the switch or outlet.

- All outlets should have a coverplate to help prevent exposure to "live" wiring.
- If plugs seem to fit loosely in a particular outlet, the outlet may be worn and could overheat; a qualified electrician should check it.
- Put inexpensive safety covers over receptacle outlets to help prevent children from inserting small objects into the outlets.
- All outside receptacles, as well as bathroom, kitchen, basement, garage, and crawlspace receptacles or anywhere water and electricity may come into contact should be protected by ground fault circuit interrupters (GFCI's).
- Outdoor receptacles should also have weatherproof covers to help protect against shock hazards. Close the covers on all unused outdoor receptacles.
- If receptacles or switches are wired with aluminum wiring instead of the more traditional copper, write to CPSC, Washington, DC 20207 for a booklet called "Repairing Aluminum Wiring."
  GFCI

If this small device were installed in every home in the United States, more than two-thirds of all residential electrocutions could be prevented. The device is called a Ground Fault Circuit Interrupter, or GFCI.

What is a GFCI?
GFCI's are electrical devices designed to detect ground faults. Ground faults occur when electrical current is "leaking" somewhere outside the path where the current is supposed to flow. If your body provides the path to ground for this leakage, you could be burned, shocked, or even electrocuted.

How do GFCI's work?
The GFCI constantly monitors electricity flowing in a circuit to sense any imbalance in the current. If the current going into the circuit differs by even a small amount from that returning, the GFCI switches off power to that circuit.
The GFCI interrupts power quickly enough to help prevent your receiving a lethal dose of electricity. Even with a GFCI, you might be shocked; but the GFCI limits the time you are exposed to the shock and helps protect against serious injury and electrocution. GFCI's should be tested monthly to determine that they are working properly.

Are GFCI's required by law?
In homes built to comply with the present National Electrical Code (NEC), GFCI protection is required for:

- All outdoor receptacles
- All bathroom receptacles

- Garage wall receptacles
- All kitchen receptacles that serve the counter top
- Receptacles in crawl spaces and unfinished basements.

You should inspect your home to see if GFCI protection is provided in these areas.

What are the different types of GFCI's?
Circuit breaker type GFCI's can be added in electrical panel to replace ordinary circuit breakers. They should be installed by a qualified electrician.
Receptacle type GFCI's can be used in homes protected by either fuses or circuit breakers. A qualified electrician or a consumer knowledgeable about electrical wiring should install them.
Portable GFCI's simply plug into a receptacle and require no special knowledge or equipment to install. They can be used in any receptacle.

The DO'S and DON'TS of ELECTRICAL SAFETY
DO'S. . . . .
DO use extension cords only on a temporary basis.
DO put safety covers on unused receptacle outlets and extension cords.
DO unplug an appliance and call an electrician if the receptacle coverplate feels hot or if there is sparking, smoke, or odor coming from the outlet, plug, or appliance.
DO examine appliance and extension cords regularly for signs of wear and tear or damage to insulation.
DO unplug all non-essential electrical appliances when not in use.
DO test GFCI's monthly according to manufacturer's instructions to determine that they are working properly.
DO use extension cords that have been listed by a Nationally Recognized Testing Laboratory.

DON'TS. . . . .
DON'T use extension cords as permanent substitute for inadequate house wiring.
DON'T use extension cords that are worn or damaged and don't attach extension cords to the wall with nails or staples.
DON'T put extension cords under rugs where they might be walked on; don't rest anything on an extension cord.
DON'T overload cords with too many appliances.
DON'T touch any appliances that has emitted an electrical shock until the appliance has been unplugged.
DON'T place electrical appliances where they might come in contact with water. NEVER reach into water for a plugged-in appliance - turn off power, then unplug it.
DON'T place an appliance cord where it might touch a hot surface.
DON'T leave any wiring exposed in outlets and switches. Use the correct size cover plate.
DON'T ignore switches or outlets that don't work. Obtain the help of a qualified electrician.
DON'T let cords hang over counter tops where children can pull down an appliance.

Residential Electrical Safety

GET PLUGGED INTO ELECTRICAL SAFETY
and help protect your home and your loved ones by taking a few minutes to check for unsafe condition
Outlets
Check for outlets that have loose-fitting plugs, which can overheat and lead to fire. Replace any missing or broken coverplates. Make sure there are safety covers on all unused outlets that are accessible to children.

Cords
Make sure cords are in good condition B not frayed or cracked, Make sure they are placed out of traffic areas. Cords should never be nailed or stapled to the wall, baseboard or to another object. Do not place cords under carpets or rugs or rest any furniture on them.

Extension Cords
Check to see that the cords are not overloaded. Additionally, extension cords should only be used on a temporary basis; they are not intended as permanent household wiring. Make sure extension cords have safety closures to help prevent young children from shock hazards and mouth burn injuries.

Plugs
Make sure your plugs fit your outlets. Never remove the ground pin (the third prong) to make a three-prong plug fit a two-conductor outlet; this could lead to an electrical shock. NEVER FORCE A PLUG INTO AN OUTLET IF IT DOESN=T FIT. Plugs should fit securely into outlets. Avoid overloading outlets with too many appliances.

Ground Fault Circuit Interrupters (GFCI'S)
GFCI@s can help prevent electrocution. They should be used in any area where water and electricity may come into contact. When a GFCI senses current leakage in an electrical circuit, it assumes a ground fault has occurred. It then interrupts power fast enough to help prevent serious injury from electrical shock. Test GFCI=s regularly according to the manufacturer=s instructions to make sure they are working properly.

Light Bulbs
Check the wattage of all bulbs in light fixtures to make sure they are the correct wattage for the size of the fixture. Replace bulbs that have higher wattage than recommended; if you don=t know the correct wattage, check with the manufacturer of the fixture. Make sure bulbs are screwed in securely; loose bulbs may overheat.

Circuit Breakers and Fuses
Circuit breaker and fuses should be the correct size current rating for their circuit. If you do not know the correct size, have an electrician identify and label the size to be used. Always fuse with the same size fuse.

Water and Electricity Do Not Mix
Don't leave plugged in appliances where they might come into contact with water. If a plugged-in appliance falls into water. NEVER reach in to pull it out C even if it=s turned off. First turn off the power source at the panelboard and then unplug the appliance. If you have an appliance that has gotten wet, don=t use it until it has been checked by a qualified repair person.

Appliances
If an appliance repeatedly blows a fuse, trips a circuit breaker, or if it has given you a shock, unplug it and have it repaired or replaced.

Outdoor Safety
Electric-powered mowers and other tools should not be used in the rain, on wet grass or in wet

conditions. Inspect power tools and electric lawn mowers before each use for frayed power cords, broken plugs, and cracked or broken housings. If damaged, stop using it immediately. Repair it or replace it. Always use an extension cord marked for outdoor use and rated for the power needs of your tools. Remember to unplug all portable power tools when not in use. Since metal ladders conduct electricity, watch out for overhead wires and power lines.

Lightning

During an electrical storm, do not use appliances (i.e. hair dryers, toasters, and radios) or telephones (except in an emergency); do not take a bath or shower; keep batteries on hand for flashlights and radios in case of a power outage; and use surge protectors on electronic devices and appliances.

Halogen Floor Lamps

Halogen floor lamps operate at much higher temperatures than a standard incandescent light bulb. Never place a halogen floor lamp where it could come in contact with draperies, clothing or other combustible materials.