Understanding Your Home Electrical System

Electricity plays an essential role in how your home operates. Whether watching TV, powering heating and cooling systems, or charging a cell phone, we rely on our home’s electrical system to provide us with power when and where we need it.

By understanding the basics of how electricity is distributed around your home, you can keep this important system properly maintained and in safe working condition:

*Electricity* enters your home through a service head from a series of outdoor power lines or an underground connection. A typical service head consists of two 120-volt wires and one neutral wire that deliver power to lights and appliances around the home.

The 120-volt circuits use one phase of the electrical service to power standard home appliances. However, certain larger appliances such as water heaters, electric ranges, or clothes dryers require a 240-volt circuit, which is created using both 120-volt wires and the neutral wire.

The electric meter is mounted outdoors where electricity enters your home. This device is used to measure the amount of electricity that is consumed in your home. The meter is monitored by your electric utility company and is protected by law—tampering with it is both extremely dangerous and illegal.

The electrical service panel is the central distribution point for delivering electricity to switches, outlets, and appliances throughout the house. Located near the electric meter, the service panel is equipped with breakers or fuses that shut off power to the circuits if an electrical system failure occurs.

Grounding is the method used to connect an electrical system to the earth with a wire. Grounding adds critical protection against electric shock and electrocution by using a grounding rod to provide a third path for conducting electricity in the event of a short circuit or an overload. Grounding will help protect the person working on the system, the system itself, and any appliances and equipment that are connected to the system.
Electrical Outlets & Receptacles

Electrical outlets are the place where you are most likely to interact with your home’s electrical system on a daily basis.

Polarized & Grounded Outlets: 1920s – Present

Since 1920, most homes have been outfitted with polarized outlets that feature two vertical slots of different sizes. These outlets are designed so that the slot for the neutral wire is wider than the slot for the hot wire, making it difficult to insert an electrical plug the wrong way. When used with a polarized plug, these outlets provide protection by keeping electrical current directed.

Grounded outlets have a round hole for the grounding conductor in addition to the two vertical slots. The circle slot is connected to a ground wire. Grounded outlets are required to be installed in all modern homes today. If your home does not have grounded outlets, then your electrical system is likely missing critical safety features. Consult an electrician about updating your home.

Tamper Resistant Receptacles (TRRs)

Every year, 2,400 children are injured from inserting household objects into electrical outlets. Tamper resistant receptacles (TRRs) look like standard wall outlets, but they feature an internal shutter mechanism which prevents children from sticking objects like hairpins, keys, and paperclips into the receptacle.

This spring-loaded shutter system in a TRR outlet only opens when equal pressure is applied simultaneously to both shutters, such as when an electrical plug is inserted. Unlike plastic outlet covers, TRRs provide automatic and continuous protection for children.

While hospitals have required TRRs for decades, the 2008 edition of the National Electrical Code mandated that these specialized outlets be installed in new home construction.

Ground Fault Circuit Interrupters (GFCIs)

Since the 1970s, ground fault circuit interrupters (GFCIs) have saved thousands of lives and have helped cut the number of home electrocutions in half.

GFCIs are electrical safety devices that trip electrical circuits when they detect ground faults or leakage currents. A person who becomes part of a path for leakage current will be severely shocked or electrocuted. These outlets prevent deadly shock by quickly shutting off power to the circuit if the electricity flowing into the circuit differs by even a slight amount from that returning. A GFCI should be used in any indoor or outdoor area where water may come into contact with electrical products. The 2008 edition of the National Electrical Code currently requires that GFCIs be used in all kitchens, bathrooms, garages, and outdoors. GFCIs should be tested once a month to confirm that they are working properly.

Remember! When changing light bulbs turn off the light switch. This applies in the home as well as the workplace. In the workplace additional precautions may be needed such as: having a spotter to ensure that no one turns the light back on, scheduling to minimize disruptions, or using flashlights to improve visibility.
Extension Cords

Extension cords are a convenient way to provide power right where you need it when working in or around your home, but using them improperly can be dangerous - even deadly. Keep safety in mind with these easy tips from Electrical Safety Foundation International.

Extension Cord Safety Tips:

- Extension cords should only be used on a temporary basis.
- Make sure extension cords are properly rated for their intended use, indoor or outdoor, and meet or exceed the power needs of the appliance or device being used.
- Inspect cords for damage before use. Check for cracked or frayed plugs, loose or bare wires, and loose connections.
- Never use a cord that feels hot or is damaged in any way.
- Do not run extension cords through walls or ceilings. This may cause the cord to overheat, creating a serious fire hazard.
- Do not nail or staple electrical cords to walls or baseboards.
- Make sure that cords are not pinched in doors, windows, or under heavy furniture, which could damage the cord’s insulation.
- Keep extension cords out of high-traffic areas like doorways or walkways where they pose a tripping hazard.
- Insert plugs fully so that no part of the prongs is exposed when the extension cord is in use.
- Ensure that all extension cords are certified by a nationally recognized testing laboratory such as UL, CSA, or ETL, and read the manufacturer’s instructions.

Outdoor Extension Cord Safety Tips:

- When working outdoors, use only weather-resistant heavy gauge extension cords marked “for outdoor use.” These weather resistant cords have the added safeguard of a protective coating designed to withstand the rougher outdoor environment and to prevent water from seeping in.
- Be sure amperage ratings for outdoor extension cords are higher than those of the electrical product with which they are used.
- Keep cords out of your path or work area. Throw the cord over your shoulder.
- Be sure to examine cords before each use. Damaged cords should be replaced immediately.
- Remember that extension cords are for short term needs and not for long term power solutions. Never alter or tamper with an extension cord in anyway.
Surge Protectors

Surges are sudden and unwanted increases in voltage that can damage, degrade or destroy the sensitive electronic equipment in your home or business, resulting in equipment damage or downtime, financial losses, and loss of data.

A surge protector is designed to protect your computer and other equipment from surges in power. The standard voltage in most outlets in U.S. offices is 120 volts. If the voltage rises above 120 volts, a surge protector helps prevent the increase from ruining your computer and its components.

To determine whether surges may be affecting your electrical equipment, look for:

- Computer lock-ups;
- An unexplainable corruption of data;
- Equipment shutdown;
- Loss of power; and/or
- Flickering lights.

Power Strips

A power strip is a strip of sockets that attaches to the end of a flexible cable and allows multiple devices to be plugged in to the same outlet. However, they can very easily create a fire hazard if not used appropriately.

Power strips do not provide more power to a location, just more access to the same limited capacity of the circuit into which it is connected. The circuit likely also still serves a variety of other outlets and fixtures in addition to the multiple electrical items you might be supplying with the power strip.

Safety Tips

Keep these safety principles in mind when using power strips and surge protectors:

- Remember that power strips and surge protectors are not the same thing. While some power strips are surge suppressors, be certain you are buying the equipment that matches your needs.
- Be sure you are not overloading the circuit. Know the capacity of the circuit and the power requirements of all the electrical items plugged into the power strip, and all the other outlets on the circuit.
- Surge protectors protect equipment, but they do not protect from the potential hazards of an overloaded circuit. Make sure the electrical load is not too great for the circuit.
- A heavy reliance on power strips in an indication that you have too few outlets to address your needs. Have additional outlets installed by a licensed electrician where you need them.
- Consider purchasing surge suppressors with cable and phone jacks to provide the same protection to your phone, fax, computer modem and television.
Five Steps to Riding Better

1. Follow the Rules of the Road
   • Ride with traffic and obey the same laws as motorists.
   • Use the rightmost lane that heads in the direction that you are traveling.
   • Obey all traffic control devices, such as stop signs, lights, and lane markings.
   • Always look back and use hand and arm signals to indicate your intention to stop, merge or turn.

2. Be Visible
   • Ride where drivers can see you.
   • Wear brightly colored clothing at all times.
   • At night, use a white front light and red rear light or reflector. Wear reflective tape or clothing.

3. Be Predictable
   • Ride in a straight line and don’t swerve between parked cars.
   • Make eye contact with motorists to let them know you are there.
   • Do not ride on the sidewalk.

4. Anticipate Conflicts
   • Be aware of traffic around you and be prepared to take evasive action.
   • Learn braking and turning techniques to avoid crashes.
   • Be extra alert at intersections.

5. Wear a Helmet
   • Make sure that the helmet fits on top of your head, not tipped back or forward.
   • After a crash or any impact that affects your

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Marty Says: Dogs need exercise to burn calories, stimulate their minds, and keep healthy. Exercise also tends to help dogs avoid boredom, which can lead to destructive behaviors. Supervised fun and games will satisfy many of your pet’s instinctual urges to dig, herd, chew, retrieve and chase.
May Word Search

For a chance to win a great prize, complete the Word Search and send it via e-mail to lisa.drake@oswego.edu OR through Campus Mail: Lisa Drake, 110 Lee Hall. Make sure to put your name on it! The winner for April was Ginny Battal! Look for: Electrical Safety, Electricity, Circuits, Appliances, Meter, Utility, Panel, Breakers, Fuses, Shock, Electrocution, Grounded, Tamper Resistant Receptacles, Ground Fault Circuit Interrupters, Current, Extension Cord, Prongs, Power Strip, Surge Protector, Electrician.

Ergonomic Assessments
FYI: Christine Body has been doing ergonomic assessments since 1996 and is available to do them here on campus. She can be reached at 312-2770 and would be happy to assist you with any questions or issues.

Need Help to Quit Smoking?
Oswego Health offers two smoking cessation classes:
First Wednesday of Each Month at The Manor at Seneca Hill 6:30 to 9:30 PM
Second Monday of Each Month at Oswego Hospital 2-4 PM