

UNIT 3

GENERAL SAFETY

This unit deals with general safety precautions that should be taken in the woods laboratory. After studying this unit, you will have a basic foundation of safe practices to be followed when using tools, equipment, and machines. In addition, you will begin "thinking safety" before beginning any hand or power tool operation.

GENERAL SAFETY PRACTICES

Safety should be an important part of every job. Safe work habits acquired now will be useful in years to come.

1. Always think "safety first" before performing an operation.
2. Wear safety glasses, goggles, or a face shield in danger zones or other designated areas. See Fig. 3-1.
3. Report even the slightest injury. Small cuts or other minor injuries may become serious if left unattended.
4. Notify your instructor of any unsafe conditions observed. This may include such things as dull tools and frayed electrical cords.
5. Keep the floor clear of scraps of material and wood shavings.
6. When stacking lumber, make sure it will not shift or fall.
7. Place clamped stock so it will not fall. Make sure the clamps do not extend into the pathway.

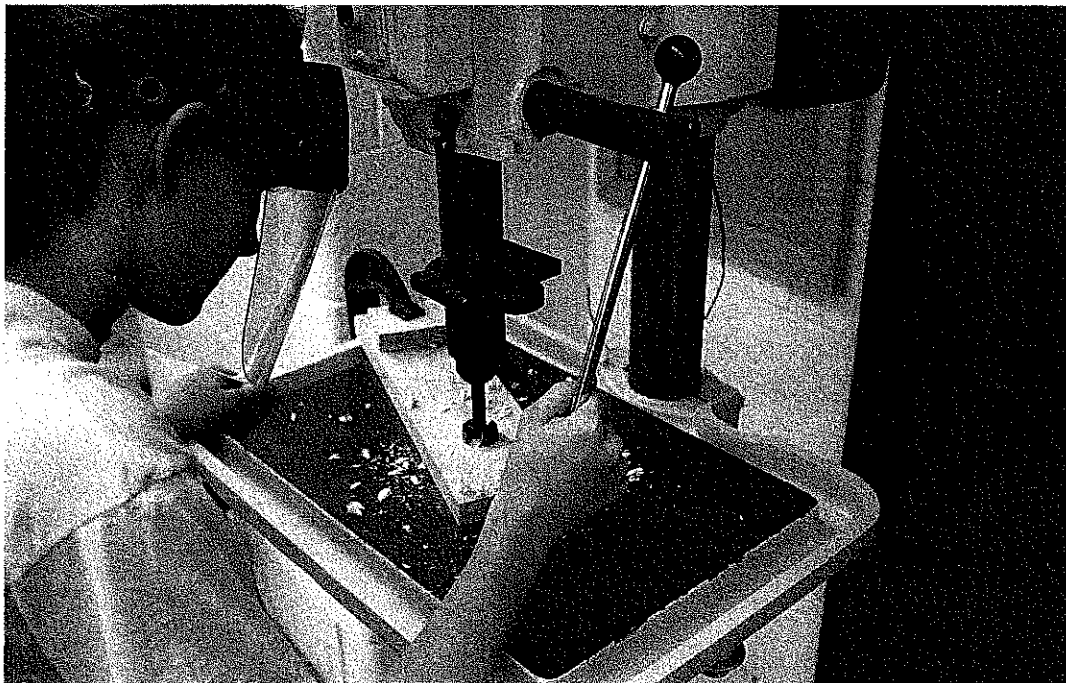


Fig. 3-1. Drill press safety. The stock is securely clamped in place. The operator is wearing a face shield.

8. Place all used rags in a metal fireproof container.
9. Keep the air as clean as possible. Use the dust collection system (if available in your laboratory) or wear a dust mask, if dusty conditions prevail. The dust mask should be approved by the National Institute for Occupational Safety and Health (NIOSH).
10. Respect the rights of others and their property.
11. Keep the lids on finish containers when not in use. Many finishes emit vapors that may be harmful if the area is not properly ventilated. Use a NIOSH-approved respirator with an organic filter if harmful vapors are present.

The Occupational Safety and Health Administration (OSHA) has added several items to their hazardous materials list. One of these items is wood dust. In the past, wood dust was always considered a nuisance, not a hazard. Studies have shown that prolonged exposure to high concentrations of wood dust to be a health hazard. The dust that presents the largest hazard is not normally visible by the naked eye, and is therefore overlooked. The majority of this dust results from sanding operations. The use of dust masks and properly operating dust collection equipment is necessary.

WORKING SAFELY WITH TOOLS AND EQUIPMENT

Tools and equipment are one of the primary sources of injury in the woods laboratory. Your instructor should explain or demonstrate the safe operation of any tool or piece of equipment prior to its use.

1. Make sure tools and accessories are properly assembled and adjusted prior to use.
2. Do not use a file that does not have a handle securely in place.
3. Make sure all cutting tools are sharp. A dull tool is more dangerous than a sharp tool.
4. Carry sharp tools with their cutting edges down. Do not carry tools in your pockets. See Fig. 3-2.
5. Be sure all stock is securely held in place before beginning any cutting operation using hand or power tools.
6. Always cut away from your body when



Fig. 3-2. Do not carry tools in your pockets—especially sharp-pointed tools.

using edge tools, Fig. 3-3. This rule has few exceptions.

7. Report all broken tools to the instructor immediately. Do not use a broken tool.
8. Always store tools in their proper manner.



Fig. 3-3. Always cut away from your body when using edge tools.

Tools are damaged frequently, or an injury may needlessly occur, because a tool was improperly stored.

9. When cleaning, avoid blowing or brushing sawdust into your eyes or your classmates eyes. Do not rub your eyes if sawdust or any other foreign object gets in them. Get immediate assistance. Avoid creating excessive amounts of dust while sanding or during clean-up. Use a NIOSH-approved dust mask.
10. Close vise handles so they do not protrude into the aisles. However, do not tighten them.

WORKING SAFELY WITH AND AROUND MACHINES

Power equipment and machines allow you to perform tasks easier and in less time than using hand tools. However, they can be more dangerous than hand tools if not used properly. Your instructor should explain or demonstrate the safe operation of any machine or piece of power equipment prior to you using it.

1. Ask your instructor for permission before using any machine.
2. Have the instructor check the setup before using any machine.
3. Use machine guards. Get permission first, if a special set-up requires temporary removal of a guard. Do not leave the machine unattended without the guard. Carefully think the total process through before beginning. Ask for assistance in the operation if it is needed.
4. Be sure everyone is out of the danger zone around a machine before beginning an operation.
5. Stay alert! Keep your mind on the operation of the machine at all times. Do not talk to anyone while operating a machine. Do not operate any power equipment if you do not feel well or are taking certain medications.
6. Be sure to work only within the capacity of the machine. Do not attempt operations beyond its limits.
7. Turn off the machine before making any adjustments.
8. Remove the plug from the receptacle, or turn off the disconnect switch, before making any changes to the setup.

9. As a machine operator, you are in full charge of the machine.
10. Ask for assistance prior to beginning a cut on long or heavy pieces.
11. Wear safe clothing. Make sure you button your shirt. If you are wearing a long-sleeve shirt, roll up the sleeves. Shoes or sneakers should be worn. Do not go barefoot or wear just sandals. Remove any loose fitting clothing such as vests or sweaters. Do not wear ties or dangling jewelry. If you have long hair, tie it back.
12. Use a push stick to cut short or narrow stock.
13. Make sure all cutting edges of blades or bits are sharp.
14. Turn off the equipment you are using after each use.
15. Inspect stock prior to beginning a cut. Look for loose knots and twists that might bind the tools.
16. Wear ear protection when operating tools with high noise levels.

In addition to the previously mentioned safety guidelines, you should also periodically check the wiring, cords, switches, etc., for physical damage, wear, and deterioration. Occasionally, people remove the grounding pin from a grounded (three-prong) plug even though this practice is extremely hazardous. See Fig. 3-4.

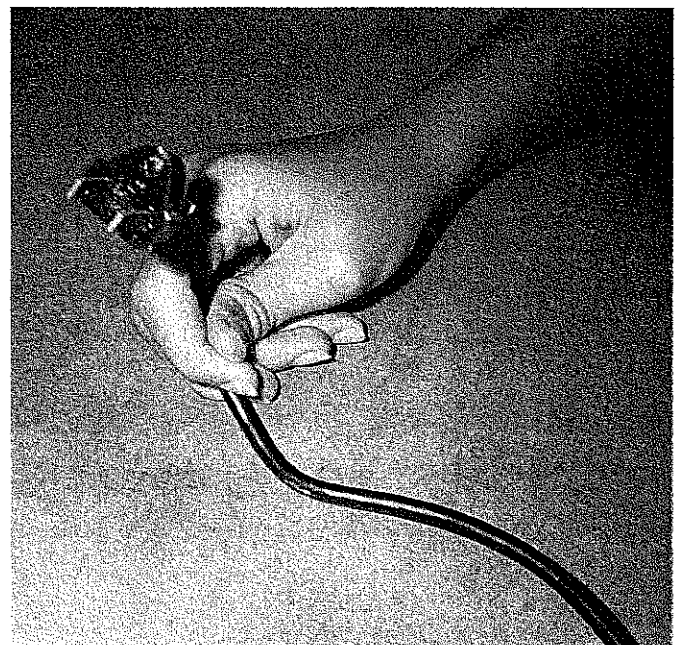


Fig. 3-4. The grounding pin should not be removed from a grounding (three-prong) plug.

This allows for a shorting condition that transfers the positive (hot) conductor to the housing of the tool and then to the operator. This results in a serious electrical shock that could easily lead to electrocution.

A hazard that is not as obvious as a missing grounding pin is when a conductor (wire) is exposed through the insulation. A volt-ohm meter may be used to determine if an electrical problem exists. It can also be used to isolate the problem.

Another electrical hazard that may exist is the overload of a circuit. When the number of plugs exceeds the design capacity of the receptacle an overload condition may occur. Overloads often occur when a number of extension cords have been connected together. This reduces the current-carrying capacity of the extension cord. If a power tool that exceeds this new current-carrying capacity is operated, the cord may overheat or the power tool will operate with less power than required. This may result in the tool overheating. The overheating of a power tool will result in a loss of efficiency, damage to the tool if operated for any length of time, or possible injury to the operator. This condition frequently does not become apparent until the extension cord becomes hot or the power tool does not have its full power.

The National Electrical Code requires all new wiring in basements, garages, bathrooms, and

outdoor locations to have a ground fault protection. A ground fault circuit interrupter (GFCI) is designed to sense when an undesired ground exists and immediately breaks the circuit. This protects the operator from electrical shock.

Many machines and pieces of power equipment are powered through the use of drive belts. The operator is usually protected from these belts with guards. Since the belts are generally not seen when the equipment is in motion, they are commonly overlooked as a potential hazard. Belts crack and split with age, and must be replaced. Fig. 3-5 shows a belt that has split and must be replaced.

FIRE PROTECTION

Every woods laboratory has a fire hazard due to the sawdust, cleaning solvents, finishes, thinners, and electrical equipment. Since each lab has a variety of fire hazards, they should be equipped with an ABC-rated fire extinguisher. An ABC-rated extinguisher allows for use with an electrical fire as well as other kinds of fires. The fire extinguisher should be prominently displayed and accessible to everyone working in the lab.

It is much easier to prevent a fire than to put out a fire. Always store flammables away from open flames, heat sources, and in approved containers. Remove used rags containing oil, solvents, finishes, and thinners from the building



Fig. 3-5. A cracked and split drive belt is a sign of age. Replace the belt immediately.

daily, and place in a metal fireproof can with a tight-fitting lid. Used rags must also be stored in a covered metal container when not in use.

Examine dust collectors, beneath table saws and shapers, portable shop vacuums, and anywhere else sawdust might accumulate on a regular basis. These areas must be kept clean to prevent the build up of dust and potential of fire.

TEST YOUR KNOWLEDGE, Unit 3

Please do not write in this text. Place your answers on a separate sheet of paper.

1. Safety glasses must be worn anytime power tools are being used either by you or by someone else in your work area. True or False?
2. Ear protection should be worn when operating tools with high noise levels. True or False?
3. Loose clothing should be worn around power tools. True or False?
4. Pants pockets are designed to carry sharp tools to prevent damage to the cutting edge. True or False?
5. The dust collection system is a large vacuum that should only be operated at clean-up time. True or False?
6. Certain glues and most finishes are toxic. Prolonged exposure to their fumes should be avoided. True or False?
7. Used rags should be placed in a metal container except when in use. True or False?
8. Tools should be returned to their storage location after use. True or False?
9. When debris accumulates on the floor, it should be put into the trash container. True or False?
10. Minor cuts and splinters need not be reported to the instructor. True or False?

ACTIVITIES

1. Make a safety poster that would be effective in your laboratory.
2. Tour your laboratory to determine if there are any potential safety hazards. If you find any hazards, determine what should be done to correct the situation.
3. Research the various types of fire extinguishers—A, B, C, and ABC. Create a chart that lists the types and purpose of each type of extinguisher.