



Information Sheet

WORKSHOP SAFETY

Topic	Information
Accidents	Immediately report all accidents or injuries to your teacher so that proper treatment can be given and the dangers removed or dealt with.
Behaviour	Workshops are hazardous environments—adopt a calm, careful attitude at all times. Walk, don't run, avoid pushing, bumping or startling others, and don't throw things.
Clothing	Dressing appropriately for the job is a very important consideration when working in a shop area. Tuck in loose clothing, remove all jewelry and tie back long hair to prevent them from getting caught in machinery. Wear sturdy, protective shoes and use the protective gear provided, i.e., eye and hearing protection. Students wearing high heels or sandals will not be permitted in the shop.
Emergencies	Know what to do in an emergency! Be familiar with all emergency equipment in the shop, including fire extinguishers, power shut off buttons, fire blankets, first aid kits, and eye wash stations.
Eye protection	Eye protection must be worn if there is any chance of injury or irritation of the eye.
Housekeeping	Clutter and spills pose unnecessary hazards—tripping, slipping, bumping into things, dropping things off messy work surfaces—so keep the floor and work areas clear and clean, store your tools, materials and projects away safely and securely, and keep aisles and exits free of obstructions at all times.
Mental condition	Most accidents occur when people are tired, rushed or under the influence of alcohol or drugs, so think SAFETY. If you are tired, stop and rest. If you are rushed, slow down. If you are under the influence of alcohol or drugs—DO NOT WORK in the shop area.
Personal responsibilities	When working in a shop environment, be aware of the risks your work may pose to others, especially when using equipment such as arc welders, compressed air, and grinders. If you see something dangerous or consider your work environment to be unsafe, report it so that it can be fixed. If you feel unsafe about a particular activity, consult with your instructor before proceeding. Conduct regular safety checks on yourself, your material and your tool.
Working conditions	Set up your work area so that it is well-organized, well-lit, and adequately ventilated. To prevent unnecessary strain, make sure that you are in a comfortable working position.

Name: _____ Date: _____



Test

WORKSHOP SAFETY

Name: _____ Date: _____

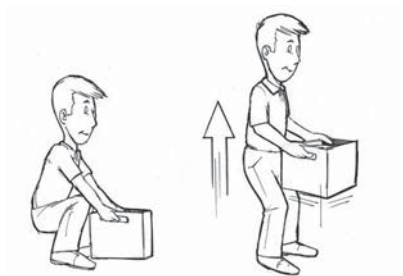
Class: _____ Section: _____

1. How should you behave while in the workshop?

2. What kind of accidents can be caused by a cluttered work place?

3. How should you dress while working in the workshop?
 - a. _____
 - b. _____
 - c. _____
4. When is eye protection required?
 - a. _____
 - b. _____
 - c. _____
5. What are three conditions necessary in a good working environment?
 - a. _____
 - b. _____
 - c. _____
6. Why is it important to report all accidents?
 - a. _____
 - b. _____
7. What should you do if there is a serious accident or other emergency?

8. Most accidents happen to people who are _____,
or _____.
9. What are three things you can and should do to keep yourself and your classmates safe?
 - a. _____
 - b. _____
 - c. _____

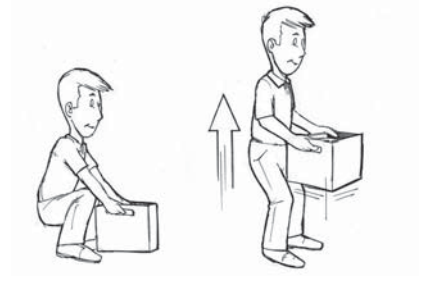


Information Sheet

TOOLS AND MATERIALS SAFETY

Topic	Information
Compressed air	<i>Occupational Health and Safety Regulation (WCB)</i> states that compressed air should not be used to clean clothing, except in carefully controlled circumstances (e.g., where the pressure is limited to 10 psig), or for cleaning off equipment if someone could be exposed to the jet of air or to the material it expels. Use a vacuum cleaner to clean clothes and the shop area.
Condition of tools	Only use tools that are in good working order. If a tool is dull, broken or out of adjustment, give it to your instructor or ask for permission to fix it.
Material handling	Back injuries are common among people who work in shop areas, so handle large and/or heavy materials with care using proper lifting techniques. Also make sure that you don't run into other people when you are moving things, and ensure that all large and/or heavy objects are safely and securely stored. Ask for help if materials are heavy.
Protect your hands	Most accidents in school workshops involve students' hands. To prevent injuries, adhere to the following rules: a) keep your hands behind the blade when using a cutting tool, b) do not use your fingers to test tools for sharpness and c) place your hand near, but not on, an object when testing for heat.
Secure your work	If the object you are working on is stable, it is less likely to slip and cause an injury; so use the vice or clamp on your workbench to secure the object. Never hold stock with one hand while trying to cut, chisel or drill it with the other hand.
Sharp objects	Do not carry sharp objects such as nails, chisels, etc., in your pockets or your mouth! Carry them with the pointed end facing downward.
Use tools as intended	Using tools improperly can lead to frustration, injury of self or damage to the tool, e.g., hammering with a wrench, prying with a chisel, or using files without handles. Take the time to get the right tool for the job.

Name: _____ Date: _____



Test

TOOLS AND MATERIALS SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. What should you do with a tool that is dull, broken or out of adjustment?

2. What part of your body is most likely to be injured if you have an accident?

3. Why is it important to secure the object you are working on?

4. What could happen if you use the wrong tool for the job?

a. _____

b. _____

5. What kind of hazards should be avoided when moving large or heavy objects around the shop?

a. _____

b. _____

6. What should you do if you are unclear about how to safely use or store a dangerous product?

a. _____

b. _____

7. You should never carry sharp things in your _____ or your _____.

_____.

8. What do the *Occupational Health and Safety Regulation (WCB)* say about using compressed air?

a. _____

b. _____

Information Sheet

WHMIS SAFETY

Topic	Information
Identification / Classification	Check with the teacher before using any substance that may be harmful. If in doubt, ask. You must familiarize yourself in how things can harm you.
Label and Material Safety Data Sheet (MSDS)	Always read the label and the MSDS, and follow the safe handling procedures before you use any product for the first time or cannot remember how to use it correctly.
Handling	Always use the proper safety equipment and procedures. Know where all the protective equipment is kept (respirators, dust mask, gloves, face shields, etc.).
Storage and Disposal	Make sure you find all the controlled products in the shop. Know where you can get rid of them safely and correctly.

Hands are the most vulnerable part of the body.

Eyes and ears also need protection.

Ask when you are not sure!

Dress safely using the appropriate protection.

Safety devices must always be used as intended.

UP!

Name: _____ Date: _____

Test

WHMIS SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. What does the acronym MSDS stand for? _____

2. What information can be found on an MSDS? _____

3. What does the acronym HEADS UP! stand for?

Information Sheet

COMBUSTIBLES AND TOXIC SUBSTANCES SAFETY

Topic	Information
Combustibles and Toxic Substances	Many industrial supplies are flammable, explosive or subject to spontaneous combustion. Store combustible supplies and waste in fire safe containers.
Chemicals/Hazardous Substances	Follow procedures for safe handling, use, storage, and disposal of chemicals/hazardous substances, including emergency procedures and spill clean up. Label containers if you transfer the product from the original container. Know where to find Material Safety Data Sheets (MSDS) and be able to answer the following questions for each product used: What are the hazards of the product you are using? How do you protect yourself from the hazards of the product? What would you do if an emergency occurred? Where can you find out more information about the product you are using?
Corrosives	Acids and caustics can burn skin and eyes causing permanent damage; they can also corrode metals—wear goggles, gloves, and protective clothing.
Flammables and Combustibles	Many industrial supplies are flammable, explosive or subject to spontaneous combustion, so store combustible supplies and waste in fire safe, closed containers, and keep them away from ignition sources.
Hazardous Waste	Follow procedures for handling and disposing of hazardous waste.
Poisons	Follow procedures for the safe use of poisons and label the containers if you transfer the product from the original container.
Substances Under Pressure (e.g. compressed gas cylinders)	Cylinders can explode if dropped or heated, so keep them away from ignition sources. Always follow procedures for safe use.
Wood Dust	Note that some wood dusts cause allergies (e.g., oak, mahogany, Western red cedar, California redwood).

Name: _____ Date: _____

Test

COMBUSTIBLES AND TOXIC SUBSTANCES SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. What is spontaneous combustion? _____

2. What questions must you be able to answer when using chemicals/hazardous substances?

a. _____

b. _____

c. _____

d. _____

3. What should you wear when working with corrosives?

4. How should you store flammable or combustible materials?

5. What should you do if you transfer a substance from one container to another?

6. Why is it important to keep cylinders away from ignition sources?

7. Why is wood dust considered a toxic substance?



Information Sheet

POWER TOOLS SAFETY

Topic	Information
Authorization	You must have authorization from your teacher before using any power tools.
Condition of tools	Only use tools that are in good operating condition. If anything seems wrong with a machine—unusual vibrations or noises—check it out before using the machine.
Personal protective equipment	Wear ear and eye protection when operating all power tools. Long hair must be contained before operating any power equipment.
Know how your machine works	Know which direction your tool will go when you run material through it, and which way the material will go. In other words, make sure you know what is going to happen before you operate a machine so that you can be ready to control those forces.
Lockout	When doing any maintenance work on a power tool, isolate the source of power (unplug it, switch the breaker off and follow written lockout procedures) to ensure that the machine does not start running when you are working on it.
Operator	The power tool operator must be qualified to use the tool. Each power tool is designed for only one operator. This person must always concentrate on the task at hand, so never distract, bump or rush them when they are using a machine—no horseplay!
Path of the tool	Whatever tool you are using, make sure it will cut, drill or grind only what you want to cut, drill or grind—you do not want the saw blade sticking out the bottom of the stock, the cutter hitting the top of a vice, or the drill bit breaking through the stock. Be aware of the cutting path of the tool—keep your hands away from this area. Make sure the cutting part is not going to come in contact with the power cord.
Power cord damage	Check all power cords daily for tears or cuts in the insulation, loose connections (plug to wire, wire to tool) and good ground connections.
Secure your work	When working with portable power tools, make sure the material stays in place—put stock in a vice, or clamp it to a workbench before approaching it with a power tool. While operating the tool, maintain a firm grip at all times.
Start-up	Check to ensure all guards and safety devices are in place and functioning properly. Make sure the power switch is in the off position before plugging in a portable power tool. Only the operator is to turn the tool on.
Stay beside running power tools	Do not walk away from a machine you have been using until it comes to a complete stop—it takes only a few seconds for a power tool to 'wind down' after it has been shut off.
Stop to make adjustments	Always unplug or lockout the tool before making any adjustments or changing settings where there is danger of being injured in the event of start up of the tool.

Name: _____ Date: _____



Test

POWER TOOLS SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. Why do you need your teacher's permission before using a power tool?

2. Why should you stay clear of someone who is using a power tool?

3. What should you always check before plugging in a power tool?

4. What should you do if there is a problem with a machine (e.g. unusual vibration or noises, damaged cord)?

5. What should you do before making adjustments to the settings on any machine?

6. Why is it important to secure the material when using portable power tools?

7. Why do you need to maintain a firm grip on the tool when operating it?

8. What does it mean to 'make sure the path of the tool is clear'?

9. What personal protective equipment should you wear when using noisy, portable tools? _____

10. How long should you stay beside a machine after turning it off? _____

11. What are 'lockout procedures' and when should you follow them?



Information Sheet

PORTABLE POWER TOOLS SAFETY

Topic	Information
Damaged power cord	Do not use tools if the power cord is damaged. The insulation should be intact and without tears, the ground connection should be working if the tool is designed with a ground, and the connections plug to wire and wire to tool should be solid. Fix or replace damaged cords
Direction of the tool and material	Understand which way the action of the tool will push the material and the tool itself. Usually they try to go in opposite directions. Power planers push the stock away and the tool towards the operator. Belt sanders do the opposite. Right angle grinders depend on which part of the wheel you grind with. The point is to make sure you know what is going to happen and are ready to control those forces. Hold that tool with a firm grip.
Ear and eye protection	Many portable power tools run at very high speeds and scream in operation. Wear hearing protection if the tool is noisy or you have to raise your voice to speak to others. Wear eye protection when using portable power tools.
Path of the tool	Make sure the path of the tool is clear. Saw blades stick out the bottom of the stock. Will they cut anything unintentionally? Is the cutter on your router or power planer going to hit the top of the vice? When the drill bit breaks through, where is it going? Whatever tool you are using, make sure it will cut, drill or grind only what you want to cut, drill or grind! Make sure the cutting part is not going to come in contact with the power cord.
Power switch	Check that the power switch is in the off position before plugging in any portable power tool.
Secure your work	Large machines stay in place while the material moves. With portable machines, the tool moves and the material is supposed to stay in place—make sure it does! Put the stock in a vice, clamp it to a work bench or wedge it in a corner, but don't try to hold a small piece of material in one hand while you approach it with a power tool held in the other.
Unplug the tool	Unplug the tool whenever you are changing bits, replacing blades or fixing something on the tool. You could easily bump the trigger unintentionally while handling the tool. Keep the plug within your sight and control so that it doesn't get inadvertently plugged in while you are working on the tool.

Name: _____ Date: _____



Test

PORTABLE POWER TOOLS SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. Why is it important to secure the material when using portable power tools?

2. Why do you need to maintain a firm grip on the tool at all times?

3. What does it mean to say “make sure the path of the tool is clear?”

4. What should you do if you find a damaged cord on a power tool?

5. What extra safety gear should you wear when using high speed portable tools?

6. What should you do when changing blades or bits?

7. Why must you keep the unplugged cord within your sight and control when changing blades or bits?

8. What should you always check before plugging in any power tool?



Information Sheet

ELECTRICAL SAFETY

Topic	Information
Avoid burns	Electricity generates heat. Take care to avoid burning yourself on hot components like resistors or light bulbs, or hot tools such as soldering irons or torches.
Avoid cuts	Handle small components with care to avoid scratches or stab wounds.
Blown fuse	If a breaker or fuse blows, disconnect the power source, then identify and fix the problem before resetting the breaker or replacing the fuse.
Capacitors	Some capacitors can store a large electric charge, so short them out before working around them.
Clothing	Wear rubber gloves and dry, non-conductive clothing.
De-energize circuits	To prevent getting a shock, de-energize circuits before working on them—pull the plug, turn off the breaker or disconnect the battery. Check with your teacher before doing any work on live circuits.
Emergency response	If someone gets an electric shock, shut off the power before trying to help them.
Footwear	Wear shoes with insulating soles and stand on a non-conducting mat.
Hot circuits	Be careful—don't become part of the circuit.
Knowledge of live circuits	Make sure you know what you are doing when working around live circuits—ask if you are in doubt.
Start up circuits	Stand back when turning on a circuit or project for the first time, just in case there are sparks, flames, smoke, etc. Wear appropriate eye protection.
Tools	Only use tools that are insulated to protect against electric shock (e.g., with plastic or rubber handles).
Wet conditions	Water is a great conductor of electricity, so do not work in wet conditions unless you are using a ground fault circuit interrupter (GFCI) breaker.

Name: _____ Date: _____

Test

ELECTRICAL SAFETY



Name: _____ Date: _____

Class: _____ Section: _____

1. How do you de-energize circuits before working on them?

2. Why is it important to short-out large capacitors before working around them?

3. Why is it dangerous to work with electricity in wet conditions?

4. If someone gets a serious shock, what should you do first?

5. Why should you stand back when you turn on a circuit or project for the first time?

6. Why is it really important not to work around live electricity unless you know what you are doing?

7. How do you prevent current flowing through you to the ground?

8. Why is water so dangerous around live circuits?

9. As an extra precaution, what is the advantage of working with one hand in your pocket?

10. If a circuit breaker or fuse trips, what do you do before resetting the breaker or replacing the fuse?

Information Sheet

BAND SAW SAFETY

- | |
|---|
| <ul style="list-style-type: none"> ▪ Set the upper guide and blade guard so they are just above the stock. This guards the blade and helps to keep the cut straight. The upper guide should be within 3mm of the wood. |
| <ul style="list-style-type: none"> ▪ While cutting, use a push stick and keep your fingers at least 5cm away from the blade at all times. You can't cut your fingers if you don't touch the blade! |
| <ul style="list-style-type: none"> ▪ Always feed the stock with light pressure and avoid excessive twisting of the blade. If you push too hard or twist too much, you will hear the saw slow down. This is your cue to lighten up. Too much pressure or twisting can break the blade. Use even less pressure as you near the end of a cut because the blade will come out the last millimetre or so. |
| <ul style="list-style-type: none"> ▪ If you have a number of cuts to make, plan your work so you can proceed in a sensible order. Never back out of long, curved cuts. |
| <ul style="list-style-type: none"> ▪ Use relief cuts on sharp corners. Thinner blades can cut sharper corners without relief cuts. |
| <ul style="list-style-type: none"> ▪ Round or irregular shaped wood presents special dangers because the force of the blade can twist it out of your control. Never cut round or odd shaped pieces unless you use a jig to stabilize them. |
| <ul style="list-style-type: none"> ▪ If the machine has a brake, use it to stop the blade after the power has been switched off; otherwise, stay with the machine until the blade stops moving. Recognize that a blade is sharp enough to cut even when it is not in motion. |
| <ul style="list-style-type: none"> ▪ If the blade breaks, turn off the machine and tell your teacher. |
| <ul style="list-style-type: none"> ▪ Do not stand to the right of the band saw while someone else is using it. If the blade breaks, it might flip out in that direction. |
| <ul style="list-style-type: none"> ▪ Both eye and hearing protection are required when using a band saw. |

Name: _____ Date: _____

Test

BAND SAW SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. How close to the stock should you set the upper guide? _____

2. What is the minimum distance you should keep your fingers from the blade? _____

3. How can you tell if you are using too much pressure or twisting the blade excessively?

4. If you have a number of cuts to make, what should you do before you start?

5. When are 'relief cuts' needed?

6. Why is it dangerous to cut round or odd shaped pieces on the band saw?

7. What should you do if the blade breaks?

8. Why should you stay away from the right hand side of the saw while it is running?

9. Identify three steps for shutting down a band saw?

10. What personal protective equipment is required when operating a band saw?

Information Sheet

ELECTRIC HAND DRILL SAFETY

- Secure your stock before drilling. Large pieces may be stable on their own, but smaller pieces should be held in a vice. If there is any chance that the stock could catch on the bit and spin around, secure it in a vice or clamp. Keep the cord away from the drilling area.
- Centre punch metals before drilling. Many of you have had the experience of trying to use a hand drill on a piece of metal only to find the bit scooting all over the surface. A small dimple made with a punch will keep the bit in place.
- Make sure the bit is properly sharpened, and straight and tight in the chuck.
- Tie long hair back—otherwise power equipment must not be used. Bending over your work or lifting the drill in the air are perfect opportunities for the electric hand drill to grab a strand or two.
- Large drills are powerful enough to break your arm, so make sure you have a good grip on the drill and be prepared to hold it if it 'kicks,' especially as the bit passes through the far side of a piece of metal.
- Both eye and hearing protection are required when using an electric hand drill.

Hands are the most vulnerable part of the body.

Eyes and ears also need protection.

Ask when you are not sure!

Dress safely using the appropriate protection.

Safety devices must always be used as intended.

UP!

Name: _____ Date: _____

Test

ELECTRIC HAND DRILL SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. What could happen if the stock you are drilling is not secured?

2. What do you need to do before you try to drill a piece of metal?

3. Drill bits must be _____ and _____ in the chuck.

4. Why is long hair a particular hazard when using drills?

5. When is an electric hand drill most likely to 'kick'?

6. What personal protective equipment is required when using an electric hand drill?

7. What does the acronym HEADS UP! stand for?

Information Sheet

JOINTER SAFETY

<ul style="list-style-type: none"> ▪ After set up, ensure that all guards are in place and functional before turning on the jointer.
<ul style="list-style-type: none"> ▪ Most jointer accidents are caused by trying to joint wood that is too small—the wood flips up and back, often breaking the operator's thumb. Never joint stock that is less than 300mm long.
<ul style="list-style-type: none"> ▪ On the jointer, you push the wood through the cut. If you try to cut too much, a kickback is likely to result. The maximum depth of cut when jointing an edge is 3mm. Maximum depth of the cut when jointing a surface (anything wider than 50mm) is 1.5mm.
<ul style="list-style-type: none"> ▪ Always joint with the grain. This will give you a smoother cut and a better finish.
<ul style="list-style-type: none"> ▪ Check your stock for staples, grit or other junk in the wood, and also look for loose knots and severe checks. Defects in the wood could damage the machine and cause kickback.
<ul style="list-style-type: none"> ▪ Step your hands passed the cutter head. If the wood were to kick out when your hand was above the cutter, your hand would drop onto the knives.
<ul style="list-style-type: none"> ▪ You must use a push stick if the stock you are jointing is lower than the fence. It is hard to get a good grip on wood below the fence.
<ul style="list-style-type: none"> ▪ Don't change the depth of the outfeed table. Adjustments must be made by a qualified person. Your teacher probably spent hours getting it just right and the setting is critical. If you change it, you will mess up your cut and create a hazard.
<ul style="list-style-type: none"> ▪ Wear eye and hearing protection when using a jointer.

Hands are the most vulnerable part of the body.

Eyes and ears also need protection.

Ask when you are not sure!

Dress safely using the appropriate protection.

Safety devices must always be used as intended.

UP!

Name: _____ Date: _____

Test

JOINTER SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. What is the minimum length of stock that should be cut on the jointer? _____

2. What is the maximum depth of cut that should be used when:

a. jointing an edge _____

b. jointing a surface _____

3. Why do you always joint with the grain?

4. Why are bad checks in the wood or loose knots dangerous on the jointer?

5. Why should you never pass your hands directly over the cutter head?

6. When do you have to use a push stick?

7. Is it okay to adjust the height of the outfeed table? Why or why not?

8. What does the acronym HEADS UP! stand for?

Information Sheet

PLANER SAFETY

<ul style="list-style-type: none"> ▪ After set up, ensure all guards are in place and functional before turning on the planer.
<ul style="list-style-type: none"> ▪ Never plane stock that is less than 300mm long. Short stock can get hung up between the power rollers inside the planer.
<ul style="list-style-type: none"> ▪ Most planers have a shear pin that will break if the machine is overloaded. This protects more expensive machine parts from damage. Do not plane more than 3mm per pass.
<ul style="list-style-type: none"> ▪ As with many power tools, wood can kick back out of the planer. Stand to the side so you won't get 'kicked' if the wood does shoot out. Never look into a running planer.
<ul style="list-style-type: none"> ▪ Sometimes, if the vacuum system is plugged, shavings build up on the table of the planer. Never brush them off the table with your hand. If you need to clear the table, you should shut the planer off, wait for it to stop and use a brush.
<ul style="list-style-type: none"> ▪ Check your stock for staples, grit or other junk in the wood, and also look for loose knots and severe checks. Defects in the wood could damage the machine and cause kickback.
<ul style="list-style-type: none"> ▪ The rollers on this machine push the wood down against the table, hard. Tuck all loose clothing in and don't get your fingers pinched between the wood and the table.
<ul style="list-style-type: none"> ▪ You can plane really thin wood but, because it has a tendency to flex under the rollers, it is recommended that you use a backing board when planing stock that is less than 10mm thick.
<ul style="list-style-type: none"> ▪ If your wood gets stuck, disengage the clutch and turn off the planer. Do not use your hand to clear the blockage—ask your instructor for assistance.
<ul style="list-style-type: none"> ▪ Because the planer is a very noisy machine, wear hearing protection while operating it.
<ul style="list-style-type: none"> ▪ Protect your eyes—wear eye protection.

Hands are the most vulnerable part of the body.

Eyes and ears also need protection.

Ask when you are not sure!

Dress safely using the appropriate protection.

Safety devices must always be used as intended.

UP!

Name: _____ Date: _____

Test

PLANER SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. What is the minimum length of stock that should be cut on the planer? _____

2. What is the maximum depth of cut that should be made on a planer? _____

3. Why should you never look into a running planer or stand to the side as you operate it?

4. What should you do if you need to clear shavings off the table of the planer?

5. Why are severe checks in the wood or loose knots dangerous on the jointer?

6. What is dangerous about having your fingers or shirt-tail close to the table of the planer?

7. You need to use a backing board if you are planing stock that is less than _____ thick.

8. What should you do if your wood gets stuck in the planer?

9. What personal protective equipment should you wear when using a planer?

Information Sheet

PORTABLE CIRCULAR SAW SAFETY

- Position the stock so that it is stable and stationary and can be cut from a balanced and comfortable position by the operator. Smaller pieces should be secured in a vice or clamped to a bench.
- Pinching the blade is probably the most common mistake made when using a portable circular saw. To prevent it, make sure the two ends fall apart when the wood falls at the end of the cut. If the two ends fall together, they will pinch the blade and cause the saw to kick back towards you.
- Never use a portable circular saw if the blade guard is sticking. It is too easy to forget about the guard and set the saw down while the blade is spinning unprotected. If you do this, the saw will run in a circle on the floor towards you.
- Make sure the line of cut is clear underneath because you can't see the bottom of the blade. It will cut through anything it runs into. Lots of people have been shocked when their saw cut its own cord, or when the sawhorse they were working on split in half.
- Let the saw reach full speed before you begin your cut. If the blade is touching the wood when you pull the trigger, the saw will kick back towards you.
- The rotation of the blade on a portable circular saw is such that if there is a problem, the saw will jump back towards you. So keep a firm grip on the saw at all times. Keep in mind that things behind the saw, like feet or fingers, are in more danger than things in front of the saw—it never jumps forward!
- Because the portable circular saw is a very noisy machine, hearing protection must be worn when operating it.
- Protect your eyes—wear eye protection.

Hands are the most vulnerable part of the body.

Eyes and ears also need protection.

Ask when you are not sure!

Dress safely using the appropriate protection.

Safety devices must always be used as intended.

UP!

Name: _____ Date: _____

Test

PORTABLE CIRCULAR SAW SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. Before making a cut with the portable circular saw, you should position the stock so it is

2. What will happen if the ends of the wood you are cutting fall together as you finish a cut with the portable circular saw?

3. What could happen if the blade guard on a portable circular saw is sticking open?

4. Why is it important to keep the line of the cut clear underneath the wood?

5. What will happen if the blade is touching the wood when you pull the trigger to start the saw?

6. Why is it important to keep a firm grip on the saw at all times?

7. What does the acronym HEADS UP! stand for?

Information Sheet

RADIAL ARM SAW SAFETY

<ul style="list-style-type: none"> ▪ Make sure the blade guard is in place and works properly.
<ul style="list-style-type: none"> ▪ It is not safe to cut wood that is less than 300mm long on the radial arm saw because your fingers will end up too close to the blade.
<ul style="list-style-type: none"> ▪ Make sure the wood you are cutting is well supported, and not stacked above the fence. If you are cutting a bunch of pieces at once (gang cutting) make sure they are piled securely, otherwise the blade could find a loose piece and snap it towards the fence. This would take the cut out of your control.
<ul style="list-style-type: none"> ▪ Check wood for knots and non-wood material such as gravel, nails, etc.
<ul style="list-style-type: none"> ▪ Keep your hands at least 150mm to either side of the blade at all times. The area in front of the blade is always dangerous because the carriage could come forward at any time, e.g., if the blade hooked a small piece of scrap. Use another piece of wood to push cuts clear of this area—don't use your hand.
<ul style="list-style-type: none"> ▪ The radial arm saw has a tendency to pull itself into the cut because of the way the blade rotates. Anticipate this and control the rate of feed carefully.
<ul style="list-style-type: none"> ▪ When you have finished with the saw, lock the carriage behind the fence so that the blade is secured safely out of the way when the next person comes to use it.
<ul style="list-style-type: none"> ▪ Never cross your arms when using the radial arm saw.
<ul style="list-style-type: none"> ▪ Do not cut round or irregular stock unless it is secured. The force of the blade can twist the wood around and pull your hand into its path.
<ul style="list-style-type: none"> ▪ If a stop is being used, hold the wood against the fence between the stop and the blade.
<ul style="list-style-type: none"> ▪ Some radial arm saws have a small table. Make sure the ends of long boards are supported to prevent the middle from flipping as you finish a cut.
<ul style="list-style-type: none"> ▪ Wear both eye and hearing protection when using a radial arm saw.

Name: _____ Date: _____

Test

RADIAL ARM SAW SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. What is the minimum length of stock that should be cut on the radial arm saw? _____

2. Why is it important to make sure all the stock being cut is well supported?

3. How far to either side of the blade should you keep your hands? _____

4. Why does the radial arm saw tend to pull itself into the cut?

5. When you have finished using the radial arm saw, what should you do with the carriage?

6. Is it safe to cross your arms when using the radial arm saw? _____

7. Why is it dangerous to cut round or odd shaped wood?

8. What will happen as you cut long boards that are not supported by a long table?

9. What personal protective equipment must be worn when operating a radial arm saw?

Information Sheet

ROUTER SAFETY

<ul style="list-style-type: none"> ▪ Unplug the router before changing the bits—you don't want to bump the switch when your hand is on the cutter!
<ul style="list-style-type: none"> ▪ Install bits with at least 15mm of the shaft in the collet chuck. Any less and the bit could vibrate loose during use.
<ul style="list-style-type: none"> ▪ After you have changed the bit, make sure the switch is off before you plug in the router, otherwise you might get an unwanted surprise.
<ul style="list-style-type: none"> ▪ Unless the object you are going to route is really big and heavy, and won't move around, you need to secure the stock with a vice or clamps. Never hold the stock with one hand while routing with the other.
<ul style="list-style-type: none"> ▪ When you are ready to go, make sure the bit is clear of the stock before you turn the router on. Once the router is up to speed, cut with even pressure at a steady pace. Don't force the cut or overload the router.
<ul style="list-style-type: none"> ▪ Always cut against the rotation of the bit. This gives you better control as you push the router into the cut. If you go the other way, the router will pull itself along.
<ul style="list-style-type: none"> ▪ When you have finished your cut, let the bit stop before you put the router down.
<ul style="list-style-type: none"> ▪ Because the router is a very noisy machine, hearing protection must be worn when operating it.

Hands are the most vulnerable part of the body.

Eyes and ears also need protection.

Ask when you are not sure!

Dress safely using the appropriate protection.

Safety devices must always be used as intended.

UP!

Name: _____ Date: _____

Test

ROUTER SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. What should you always do before changing bits on a router?

2. What is the minimum shaft length on a bit that is inserted in the chuck? _____

3. What should you check before you plug in the router?

4. Under what conditions are you allowed to use the router without securing it in clamps or a vice?

5. What should you check before you turn the router on?

6. What should you do before setting the router down after you have finished a cut?

7. What does the acronym HEADS UP! stand for?

Information Sheet

TABLE SAW SAFETY

<ul style="list-style-type: none"> ▪ Prior to use, ensure all guards, anti-kickback fingers and splitters are in place and functional.
<ul style="list-style-type: none"> ▪ Always use the guards, splitter and anti-kickback fingers unless you have authorization to remove them. Under special circumstances, e.g., dadoing or undercutting, and then they are to be reinstalled immediately.
<ul style="list-style-type: none"> ▪ Set the blade height to clear the wood by about 5mm. If you set it higher, you may create a hazard. Only set it lower for special circumstances such as undercutting or partial cutting.
<ul style="list-style-type: none"> ▪ Never cut stock that is less than 300mm long. Small stock is dangerous because: a) it brings your fingers closer to the blade and, b) it can kick back more easily because it is lighter.
<ul style="list-style-type: none"> ▪ Always use a push stick if your fingers will come within 100mm of the blade.
<ul style="list-style-type: none"> ▪ Wood can 'kick back' out of the table saw. In fact, this is one of the most common table saw accidents. Stand to the side when rip cutting so that you won't get 'kicked.'
<ul style="list-style-type: none"> ▪ When cutting on the table saw, always support the wood on its longest side. Use the fence when rip cutting, and use a miter gage or cross cut jig for cross cutting. Never use the fence when crosscutting—you will have an accident!
<ul style="list-style-type: none"> ▪ Always push the stock between the blade and the fence until it has passed the back of the blade; otherwise, the wood inside the fence could easily be caught by the blade and kicked back.
<ul style="list-style-type: none"> ▪ If you are taking stock off the back of the saw, reach around the blade, not over it. If possible, have someone help you or let the stock drop to the floor. Never reach around or over a running saw. Shut it off first.
<ul style="list-style-type: none"> ▪ Never make free hand cuts on the table saw. It is too easy to twist the wood or pinch the blade. Always use either the fence or the mitre gauge.

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Safety devices must always be used as intended.

UP!

Name: _____ Date: _____

Test

TABLE SAW SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. How high should the blade be set above the wood? _____
2. What is the minimum length of stock that should be cut on the table saw? _____
3. You must use a push stick if your fingers will come within _____ of the blade.
4. Where should you stand when rip cutting on the table saw?

5. What device should you use to guide the wood when:
 - a. rip cutting _____
 - b. cross cutting _____
6. Which of the following conditions would produce kickback: a) the piece of wood between the blade and the fence, or b) the wood outside the blade? _____
7. Is it okay to reach over the blade? _____
8. Why is it dangerous to make freehand cuts on the table saw?

9. What three safety devices should always be used when working with a table saw?
 - a. _____
 - b. _____
 - c. _____

Information Sheet

WOOD LATHE SAFETY

<ul style="list-style-type: none"> ▪ When setting up a turning in the lathe, make sure the wood is solidly mounted and all locks are secure. Many lathe accidents result when wood jumps off the machine.
<ul style="list-style-type: none"> ▪ Inspect the stock for bad glue joints, loose knots or severe checks. Any of these defects could cause an accident.
<ul style="list-style-type: none"> ▪ Keep the tool rest close to the work at all times—within 12mm, if possible. As you turn a project and the gap between the wood and the tool rest increases, so does the chance of the chisel catching.
<ul style="list-style-type: none"> ▪ Make it a habit to rotate the stock by hand before turning on the lathe. This will let you know if anything is going to bump when you turn on the power.
<ul style="list-style-type: none"> ▪ Begin turning the lathe at a low speed. The wood may be unbalanced (especially large, rough stock) and could vibrate badly at high speed.
<ul style="list-style-type: none"> ▪ Hold the chisel close to each end, not in the middle. Your front hand should control the cut by riding against the tool rest. Your backhand should steady the chisel by holding the butt against your hip.
<ul style="list-style-type: none"> ▪ Remove the tool rest from the lathe when sanding or finishing your project so there is no danger of pinching your fingers.
<ul style="list-style-type: none"> ▪ Wear eye protection when operating a wood lathe.

Hands are the most vulnerable part of the body.

Eyes and ears also need protection.

Ask when you are not sure!

Dress safely using the appropriate protection.

Safety devices must always be used as intended.

UP!

Name: _____ Date: _____

Test

WOOD LATHE SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. What could happen if the wood and the locks on the lathe were not tightened down when you turned the machine on?

2. Why should you always begin your turnings at low speed?

3. What kinds of defects in the wood could cause a problem on the lathe?

4. Why is it important to keep the tool rest close the work at all times?

5. What should you do before you turn on the power to activate the lathe?

6. Explain how to hold the chisel when turning.

7. What should you do before sanding a project on the lathe?

8. What does the acronym HEADS UP! stand for?



Information Sheet

ARC WELDING SAFETY

- Arc welding can burn or shock you! Wear protective clothing to protect exposed skin from welding splatter and UV rays, and wear leather gloves (without holes) to protect against burns and shock.
- Use screens to protect others from flash.
- Do not weld in wet conditions or while wearing wet clothing. Water is a good conductor and could cancel out the protective qualities of your clothing and gloves.
- Always wear an approved arc welding helmet with a no. 10 lens or darker. The light from arc welding is bright enough to damage your eyes permanently. Gas welding goggles or sunglasses are not good enough. Do not watch the arc when someone else is welding and make sure they don't watch you work unless they also have a helmet on.
- Wear clear eye protection when chipping, brushing or grinding your welds.
- Ensure that cables will not interfere with your work.
- Arc welding makes a lot of smoke. Make sure you have effective local ventilation to clear away the fumes.
- Make a habit of feeling, not touching, for heat before you grab anything. Vices, tools or steel near your weld can give a serious burn even though they may not look hot.
- Vapours or fumes from solvents, fuels or other flammable liquids can be explosive. Never weld a container that has held flammables unless it has been steam cleaned or is filled with water.
- Mark hot work "Hot" or guard it so it can't be contacted.

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Safety devices must always be used as intended.

UP!

Name: _____ Date: _____

Test

ARC WELDING SAFETY



Name: _____ Date: _____

Class: _____ Section: _____

1. When arc welding, your clothing must protect you against what three potential hazards?

- a. _____
- b. _____
- c. _____

2. Why is it dangerous to arc weld in wet conditions?

3. Do gas welding goggles or sunglasses provide enough eye protection for arc welding? Why or why not?

4. Clear eye protection must be worn when _____ or _____.

5. Why is it important to have lots of ventilation when arc welding?

6. In addition to the material you are welding, what else can get hot enough to burn you?

7. Why is it extremely dangerous to weld containers that have held flammable materials?

Information Sheet

BENCH GRINDER SAFETY

<ul style="list-style-type: none"> ▪ Inspect the grinder prior to use to ensure there are no cracks in the abrasive disc.
<ul style="list-style-type: none"> ▪ Check there are no flammables in the area of the grinder.
<ul style="list-style-type: none"> ▪ Use wheel dressing procedures when required.
<ul style="list-style-type: none"> ▪ Keep the tool rest within 1.5mm of the stone at all times. If there is too much room between the stone and the rest, your work could jam causing the stone to shatter. At the speed it is turning, you don't want that to happen.
<ul style="list-style-type: none"> ▪ If the stone has a flaw, it is most likely to fly apart as it speeds up, just after you start it. Always stand to the side when starting the grinder, just in case.
<ul style="list-style-type: none"> ▪ Only grind on the face of the stone, never on the side—it could explode in your face.
<ul style="list-style-type: none"> ▪ Work should be moved back and forth across the face of the stone to avoid creating a groove in the center.
<ul style="list-style-type: none"> ▪ Use moderate pressure when grinding. If you push too hard, you will stress the machine and the stone, and generate unnecessary heat in the material you are grinding.
<ul style="list-style-type: none"> ▪ Avoid grinding small pieces or, if necessary, hold them firmly in pliers or vice grips. Small pieces could easily be pulled out of your grasp and cause problems.
<ul style="list-style-type: none"> ▪ Do not grind either sheet metal or soft metals like brass or aluminum on the grinder. Sheet metal vibrates too much and can easily get caught, and non-ferrous metals such as aluminum can quickly plug up the stones.
<ul style="list-style-type: none"> ▪ Grinding generates a lot of heat in the metal being ground. Cool your material regularly and take care not to burn yourself when it is hot. If you are using the grinder to sharpen tools, be aware that too much heat can ruin the temper in tool steel—this is not good for your tools.
<ul style="list-style-type: none"> ▪ Full face shield, leather apron and hearing protection are required.

Name: _____ Date: _____

Test

BENCH GRINDER SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. What is the maximum distance allowed between the tool rest and the stone on a grinder? _____
2. What could happen if you were to grind on the side of a grinding stone?

3. Where should you stand when starting up the bench grinder?

4. Why should you avoid using excessive pressure when working on the bench grinder?

5. Why is it especially dangerous to grind small pieces on the bench grinder?

6. What kind of materials should not be worked on the bench grinder?

7. Why is there a danger of burning yourself when using the bench grinder?

8. What personal protective equipment do you need when operating a bench grinder?

Information Sheet

BUFFER/WIRE WHEEL SAFETY

- The biggest danger on the buffer or wire wheel is having the wheel grab your work. This could happen if the wheel were to hook on a corner or the edge of your work. To prevent this from happening, hold your work so the wheel is spinning off the corners.
- Hold your work against the wheel just below the middle point. If the wheel should grab it, it will throw it down and away from you.
- Buffing can generate a fair amount of heat, so handle your work with care to avoid getting burnt.
- Strands of wire from the wire wheel can come loose. Be sure to wear eye protection.

Hands are the most vulnerable part of the body.

Eyes and ears also need protection.

Ask when you are not sure!

Dress safely using the appropriate protection.

Safety devices must always be used as intended.

UP!

Name: _____ Date: _____

Test

BUFFER/WIRE WHEEL SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. How do you prevent the buffer or wire wheel from grabbing your work out of your hands?

2. Why should you hold your work just below the centre of the wheel?

3. Why is there a danger of burning yourself when using the buffer or wire wheel?

4. Why is eye protection especially important when using the wire wheel?

5. What does the acronym HEADS UP! stand for?

Information Sheet

DRILL PRESS SAFETY

<ul style="list-style-type: none"> ▪ Tie long hair back.
<ul style="list-style-type: none"> ▪ Remove all strings and/or jewelry that could get caught in the drill press.
<ul style="list-style-type: none"> ▪ The material you intend to drill must be held in the drill vice or be clamped to the drill table. This will prevent it from spinning around and hurting you if the drill bit were to catch as it went through.
<ul style="list-style-type: none"> ▪ Be sure to 'centre punch' hard materials like metals before you drill them. The punch mark will prevent the drill bit from slipping around as you try to start the hole.
<ul style="list-style-type: none"> ▪ Set appropriate drill speed for the drill bit.
<ul style="list-style-type: none"> ▪ Make sure the chuck key is out of the chuck every time you go to start the drill.
<ul style="list-style-type: none"> ▪ If you are drilling a series of holes or are in a rush to get onto the next job, slow down to make sure the bit is clear of the stock before you move it. If you do move the stock when the bit is still in the hole, you could break the bit.
<ul style="list-style-type: none"> ▪ Set up your operation to avoid drilling into the vice or table. Put some scrap wood under your work, or position it in the vice so that the bit will come through in the centre or at the side of the vice.

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Ask when you are not sure!

Dress safely using the appropriate protection.

Safety devices must always be used as intended.

UP!

Name: _____ Date: _____

Test

DRILL PRESS SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. Why is it important to secure the material you plan to drill on the drill press?

2. How do you prevent the bit from slipping off target and possibly breaking when drilling hard materials like metal?

3. What should you check each time you are about to start the drill press?

4. What could happen if you move the stock before the bit is completely clear of the hole?

5. How can you avoid making unwanted holes in the drill press vice?

6. Why do you need to tie long hair back and remove jewelry and/or strings when working around the drill press?

Information Sheet

FOUNDRY SAFETY

- Do not light the furnace unless you have permission. The gas used to heat it is very explosive and a serious accident could result from someone trying to light it if they didn't really know how.
- Preheat cold metal before adding it to a pot of molten metal to reduce its moisture content. If you were to drop cold metal into molten metal, the intense heat could vaporize the moisture instantly and cause an explosion of molten metal.
- Wear a mesh facemask, burn-proof gloves and leggings when pouring a cast. The molten metal you are working with will quickly melt or burn through standard safety gear so you need special protective clothing that can withstand extremely high heat.
- Stand to the side as you pour a casting. Again, moisture is the problem. If steam gets trapped inside a tightly packed mold, the resulting pressure could blow the mold apart.
- Put the flask on a bed of sand or fire bricks while you pour the casting. Concrete has moisture in it, so if you accidentally drop liquid metal on it, the concrete could fracture and send chips flying unpredictably.
- Castings take a long time to cool down. Use extreme caution when opening up a recent casting to avoid burning yourself. Freshly poured castings must be marked "HOT."

Hands are the most vulnerable part of the body.

Eyes and ears also need protection.

Ask when you are not sure!

Dress safely using the appropriate protection.

Safety devices must always be used as intended.

UP!

Name: _____ Date: _____

Test

FOUNDRY SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. Why is it dangerous to try lighting the furnace if you don't really know how and don't have permission?

2. What should you do to a piece of metal before adding it to a pot of molten metal?

3. What safety gear should be worn when casting?

4. Why should you stand to the side when pouring a casting?

5. What might happen to concrete if molten metal is dropped on it?

6. What do you need to be careful about when opening up a recent casting?

7. What does the acronym HEADS UP! stand for?

Information Sheet

METAL CUT OFF SAWS SAFETY

<ul style="list-style-type: none"> ▪ Make sure the stock is tightly clamped in place before starting your cut. If it isn't, the blade will grab it and roll it around.
<ul style="list-style-type: none"> ▪ Keep your hands clear of the path of the blade at all times. Some of these saws cut automatically; on others, you control the cut. In either case, keep your hands clear and out of danger.
<ul style="list-style-type: none"> ▪ Do not force the cut. There is often a temptation to speed things up by pushing on the saw but this could overload the machine or damage the blade.
<ul style="list-style-type: none"> ▪ Although these saws cut automatically, you should always watch the cut as it proceeds. The blade could twist or jam, the stock could twist free, or the saw could fail to stop when it should. Be there.
<ul style="list-style-type: none"> ▪ Take care in handling fresh cut pieces of metal—they could be sharp and hot. Cool and deburr them right away.
<ul style="list-style-type: none"> ▪ If metal chips or filings build up in the saw, turn it off and clean it with a brush—never use your hand. Metal slivers really hurt.
<ul style="list-style-type: none"> ▪ Wear eye and hearing protection.
<ul style="list-style-type: none"> ▪ Wear appropriate gloves when handling the stock.

Hands are the most vulnerable part of the body.

Eyes and ears also need protection.

Ask when you are not sure!

Dress safely using the appropriate protection.

Safety devices must always be used as intended.

UP!

Name: _____ Date: _____

Test

METAL CUT OFF SAWS SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. What will happen if the stock is not tightly clamped in the metal cut off saw before you start your cut?

2. Keep your hands _____ at all times.

3. What could happen if you try to force the cut while using a metal cut off saw?

4. Why do you need to keep an eye on the cut as it proceeds?

5. What makes freshly cut pieces of metal dangerous?

6. If filings build up on the machine, how should you clean them off?

7. What personal protective equipment is required when operating the metal cut off saw?

Information Sheet

METAL LATHE SAFETY

<ul style="list-style-type: none"> ▪ Make sure the stock is secure and that all locks are tight before turning on the lathe. Otherwise the piece of steel might shift or fly out when it starts to spin or when you start to cut it.
<ul style="list-style-type: none"> ▪ Never leave the chuck key in the chuck. It should either be in your hand, if you are using it, or on the tool rack. Leaving it in the chuck will lead to an accident.
<ul style="list-style-type: none"> ▪ Material that extends more than twice its diameter out of the chuck should be supported on the tailstock end. If unsupported, the stock could flex as it spins or as you cut, causing vibration, chatter and a hazardous situation.
<ul style="list-style-type: none"> ▪ Use extreme caution if your stock extends through the headstock end. Many accidents have resulted when an operator, while concentrating on the cut, failed to notice the end of the stock whip around. Others have been injured by trying to steady the protruding end (don't do this), or by bumping into it accidentally as they pass by.
<ul style="list-style-type: none"> ▪ Tuck in your shirt-tail to prevent it from getting caught in the feed and lead screws which are right by your hips.
<ul style="list-style-type: none"> ▪ Wear eye protection.
<ul style="list-style-type: none"> ▪ Wear appropriate gloves when handling stock, but not when operating the lathe.
<ul style="list-style-type: none"> ▪ Ensure the stock has completely stopped rotating before attempting to handle it.

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Ask when you are not sure!

Dress safely using the appropriate protection.

Safety devices must always be used as intended.

UP!

Name: _____ Date: _____

Test

METAL LATHE SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. What two things should you secure before starting the metal lathe?

a. _____

b. _____

2. Why should you never leave the chuck key in the lathe chuck?

3. Any material that extends more than _____ its diameter out of the chuck should be supported on the tailstock end.

4. Why is stock that sticks out of the headstock end of the lathe dangerous?

5. Why is it important to remove open coats and tuck in your shirt-tails when using the lathe?

6. What personal protective equipment is required when operating a metal lathe and handling the stock?



Information Sheet

OXY-ACETYLENE SAFETY

<ul style="list-style-type: none"> ▪ You must be trained and authorized before you are allowed to use the oxy-acetylene equipment.
<ul style="list-style-type: none"> ▪ Ensure acetylene cylinders are kept upright at all time.
<ul style="list-style-type: none"> ▪ When setting up oxy-acetylene equipment, never use grease or oil to lubricate the fittings. Oil and grease are very flammable in the presence of oxygen.
<ul style="list-style-type: none"> ▪ Vapours or fumes from solvents, fuels or other flammable liquids can be explosive. Never weld a container that has held flammables unless it has been steam cleaned or is filled with water or an inert gas.
<ul style="list-style-type: none"> ▪ Always watch for gas leaks by listening to or brushing the connections with soapy water.
<ul style="list-style-type: none"> ▪ Open the cylinders slowly, one half turn only at a time. This releases pressure gently into the system and lets you shut the cylinders off quickly if there is a problem at start up.
<ul style="list-style-type: none"> ▪ Always wear leather gloves and approved welding goggles. Make sure anyone who watches or helps also wears proper protective gear.
<ul style="list-style-type: none"> ▪ Make sure your work area has effective local ventilation. Galvanized metal, brass or bronze emit toxic fumes when heated. Respiratory protection may also be required.
<ul style="list-style-type: none"> ▪ Be aware of the location of the hoses are all times.
<ul style="list-style-type: none"> ▪ Purge with acetylene. Light the acetylene first with a striker (not matches), then add oxygen. This will ensure that there is no mixed gas in the lines that could burn back up inside.
<ul style="list-style-type: none"> ▪ Mark recently welded work "Hot" or guard it to prevent it from being contacted.
<ul style="list-style-type: none"> ▪ Make a habit of feeling for heat before you grab hold of anything. Vices, bricks, or tools can give a serious burn even though they may not look hot.
<ul style="list-style-type: none"> ▪ The oxy-acetylene flame burns at about 3000°C. Always watch where you put the tip and only set the torch down in a proper holder so it doesn't fall.
<ul style="list-style-type: none"> ▪ When finished, turn off the torch valves, turn off the cylinder valve at the cylinder, then go back to the torch and bleed both lines.

Name: _____ Date: _____



Test

OXY-ACETYLENE SAFETY

Name: _____

Date: _____

Class: _____

Section: _____

1. What is the danger in using grease or oil to lubricate welding fittings?

2. Describe at least two ways of checking for leaks on gas welding equipment.

- a. _____
- b. _____

3. How far should you open the tank valves? _____

4. What protective equipment should always be worn when working with oxy-acetylene welding equipment?

5. What extra danger exists when welding brass, bronze or galvanized metal?

6. Why is it important to purge with acetylene before lighting the torches and adding oxygen?

7. In addition to the material you are welding, what else can get hot enough to burn you?

8. Which of the following is the correct lighting device for an oxy-acetylene torch?

- a. striker
- b. match
- c. cigarette lighter
- d. all of above

9. Why is it extremely dangerous to weld containers that have held flammable materials?

Information Sheet

RIGHT ANGLE GRINDER SAFETY

<ul style="list-style-type: none"> ▪ Inspect the grinder prior to use to ensure there are no cracks in the abrasive disc.
<ul style="list-style-type: none"> ▪ Check there are no flammables in the area before grinding.
<ul style="list-style-type: none"> ▪ Secure the stock you are going to grind so that it does not move around. Unless the material is large and very steady, you should put it in a vice or clamp it to a workbench to prevent the grinder from pushing it aside.
<ul style="list-style-type: none"> ▪ Grind with moderate pressure only. Excessive pressure generates excessive heat and puts unnecessary strain on the grinding disk, the motor and the operator.
<ul style="list-style-type: none"> ▪ Grinders shoot out a stream of cool sparks. Be conscious of where the sparks are going and take care to avoid endangering yourself and others.
<ul style="list-style-type: none"> ▪ Any time you are grinding, things will get hot. Make it a habit to test things for heat before you grab onto them.
<ul style="list-style-type: none"> ▪ Because the right angle grinder is very noisy, wear hearing protection.
<ul style="list-style-type: none"> ▪ Wear eye protection and flame resistant clothing.
<ul style="list-style-type: none"> ▪ Never remove the guard.

Hands are the most vulnerable part of the body.

Eyes and ears also need protection.

Ask when you are not sure!

Dress safely using the appropriate protection.

Safety devices must always be used as intended.

UP!

Name: _____ Date: _____

Test

RIGHT ANGLE GRINDER SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. Why is it important to secure the material you want to grind?

2. Why should you use only moderate pressure when working with the grinder?

3. How is the grinder dangerous to others nearby?

4. What should you do before picking up things that you have been grinding?

5. What personal protective equipment do you need to wear when operating a right angle grinder?



Information Sheet

AUTOMOTIVE SHOP SAFETY

<ul style="list-style-type: none"> Minimize the risk of tripping in a mechanical shop— keep parts and tools off the floor, leave the handles of floor jacks in an upright position, stand creepers up against the wall when not in use, etc.
<ul style="list-style-type: none"> Be aware of the power of gasoline and always handle it with care—minimize gasoline vapours (they are extremely flammable) by immediately wiping up spills and hanging the rags outside; keep all sparks and flames well away; do not use gasoline around hot engines and do not use it as a cleaning solvent.
<ul style="list-style-type: none"> Wipe up all spills right away, dispose of rags in identified fire safe containers, and keep tool handles and the like free of oil.
<ul style="list-style-type: none"> Because many of the supplies used in a mechanical shop are flammable, you should know where the fire extinguishers are and how to use them.
<ul style="list-style-type: none"> Many of the products and processes mechanics use contaminate the air with flammable vapours, toxic fumes or fine dust. Effective ventilation will reduce these hazards. Approved respiratory protection appropriate to the hazard must be worn when there is exposure to dusts, mists, fumes or vapours.
<ul style="list-style-type: none"> Wear goggles, appropriate gloves, shop coat and apron when handling solvents or other caustic chemicals.
<ul style="list-style-type: none"> Wear a face shield if there is risk of injury to the face (e.g., when charging a battery or connecting it to any power).
<ul style="list-style-type: none"> Wear hearing protection when exposed to loud noise or when you need to raise your voice to speak to others.
<ul style="list-style-type: none"> Brake and clutch lining may contain asbestos. Follow procedures for safe handling and disposal.

Name: _____ Date: _____



Test

AUTOMOTIVE SHOP SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. Air hoses and electrical extension cords present a tripping hazard. List four other potential tripping hazards:

- a. _____
- b. _____
- c. _____
- d. _____

2. Draw a connecting line to match the following situation/items with the correct procedure/equipment.

- | | |
|---|--|
| loud banging or grinding <input type="checkbox"/> | <input type="checkbox"/> goggles and approved gloves |
| caustic chemicals <input type="checkbox"/> | <input type="checkbox"/> fire safe containers |
| oily rags <input type="checkbox"/> | <input type="checkbox"/> outside fresh air |
| gasoline soaked rags <input type="checkbox"/> | <input type="checkbox"/> hearing protection |

3. There are different types of fire _____ for different types of _____.

4. Where are the fire extinguishers located in your auto shop?

5. Circle the correct answer for the following true and false questions:

- a. Gasoline is a recommended cleaning solvent. T or F
- b. When working in areas with dust and fumes, you she wear approved breathing protection. T or F
- c. Hearing loss can result from working in noisy environments. T or F
- d. Potential danger with charging batteries suggests you should wear eye/face protection. T or F

6. What other personal protective equipment is required in an automotive shop?

Information Sheet

SAFETY AROUND VEHICLES

- Before you begin any work on a vehicle, make sure it can't roll. Put the transmission in park for an automatic transmission, and neutral or low, as appropriate, for a standard transmission. Set the parking brake, remove the keys from ignition and then chock the wheels.
- When positioning a jack, make sure it is stable. Place it under a solid part of the frame—something that won't crumple or slip as the vehicle is raised. Also chock two of the wheels that will remain on the ground just in case the vehicle shifts as it is raised.
- Use approved jack stands to support any vehicle you are working underneath. Lifting jacks are less stable and can collapse.
- Never start a vehicle unless you are 100% sure that the motion of the engine will not endanger anyone. Your friend may ask you to crank the engine while they are under the hood—double check to make sure that their hands are clear before you turn the key. And if you are under the hood, make sure your friend at the ignition knows never to crank it until they are sure you are clear.
- Never move a vehicle unless you are 100% sure the motion of the vehicle will not endanger anyone—look around carefully, beep the horn, wait, and start moving slowly. Give anyone crouching by a wheel or bumper time to move to safety or shout before they get hurt. If the space is tight, get someone to stand outside the vehicle and direct you.
- Only use a hoist if you are authorized to do so.
- Place hoist pads under solid frame parts that will not shift as the vehicle is lifted (a few suspension parts can shift as the weight of the vehicle comes off the wheels). Check the hoist pads when the wheels are just a few inches off the ground to make sure they remain stable and secure. Get everyone out of the car and close the hood, trunk and all doors.
- Do not use a hoist that is jerky, leaking oil or slowly settling. With a car hanging over your head, you want to make sure it is going to stay up there.

Name: _____ Date: _____

Test

SAFETY AROUND VEHICLES

Name: _____ Date: _____

Class: _____ Section: _____

1. How do you make sure a vehicle will not roll when you are working on it?

2. Why should you chock the wheels of a vehicle if you plan to jack it up?

3. When would you need to use jack stands?

4. Before starting any vehicle, what should you check?

5. How can you safeguard the people who may be near a vehicle you are about to move?

6. When lifting a vehicle on the hoist, what should you check when the wheels are just a few inches off the ground?

7. What symptoms might suggest that there is a problem with a hoist and indicate that you shouldn't use it until it is fixed?

Information Sheet

SAFETY AROUND ENGINES

<ul style="list-style-type: none"> Take off all rings and bracelets before doing any mechanical work. Jewelry can get caught up in machinery and cause an injury, or even create a short circuit between electrical parts leading to a burn.
<ul style="list-style-type: none"> Keep your hands away from all moving parts when working on an engine, i.e., belts, shafts, fans, blowers.
<ul style="list-style-type: none"> Be especially careful around engine fans. Some of the hazards to watch out for include: a) having your hand clipped, b) having something fire back at you if dropped in the area of the fan, c) an unexpected start up of an electric fan on a hot engine, and d) dangling items swinging into the fan.
<ul style="list-style-type: none"> Mechanics can easily get burnt on hot cylinders, exhaust parts, radiators, or engine coolant. Never open the radiator cap on a hot engine! Check the radiator hose—if you can feel pressure, don't open the radiator cap.
<ul style="list-style-type: none"> Engine exhaust contains carbon monoxide, a colourless and odourless gas that can kill you. So do not run an engine in an enclosed, indoor space unless the exhaust is vented to the outside.
<ul style="list-style-type: none"> Handle electrical parts with care so that you don't become part of the circuit. An ignition shock will hurt but not harm you. A shock from a battery, however, can be very dangerous.
<ul style="list-style-type: none"> Engine noise can cause permanent hearing loss. Don't run an engine without a muffler. And wear hearing protection when working around loud engine noise or in a noisy shop.
<ul style="list-style-type: none"> When working on a small engine, make sure it won't start if the crankshaft is accidentally moved. Disconnect all spark plug leads if the engine does not have a kill switch.
<ul style="list-style-type: none"> After repair and prior to start-up, ensure engine is clear and safe to start.

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Eyes and ears also need protection.

Ask when you are not sure!

Dress safely using the appropriate protection.

Safety devices must always be used as intended.

UP!

Name: _____ Date: _____

Test

SAFETY AROUND ENGINES

Name: _____ Date: _____

Class: _____ Section: _____

1. Name two ways jewelry is dangerous around engines.

a. _____

b. _____

2. What moving engine parts pose a danger to your hands?

3. Describe the special hazards of engine fans.

4. What engine parts are most likely to cause burns?

5. Why is it so important to vent the exhaust outside when working around running engines?

6. Which two engine systems can cause electric shock?

a. _____

b. _____

7. Why should you use hearing protection around loud engine or shop noise?

8. How can you prevent a small engine from starting accidentally?



Information Sheet

BATTERY HANDLING SAFETY

- A lead/acid battery contains sulfuric acid that will eat your clothing and burn your skin. Protect yourself by wearing eye protection, a face shield if there is risk of injury to the face, appropriate gloves, shop coat and an apron. Clean the battery before you handle it; then handle it carefully. You can neutralize and clean the acid with a solution of baking soda and water. If you get acid on yourself, flush it off with lots of water.
- The chemical reaction in a lead/acid battery produces hydrogen gas—a very explosive substance. Keep all sparks or flames away from batteries, especially if they are being charged.
- When connecting a battery to a charger, attach the leads to the battery, then turn the charger on. To disconnect, turn the charger off; then unclip the leads. Wear a face shield when charging a battery or connecting it to any power.
- When a battery is charging, you should monitor the temperature by putting your hand on the side of it every half-hour or so. If the battery gets really hot, it is defective and must be replaced; do not continue to charge it. Don't leave a battery charging when you can't monitor it.
- When pulling a battery out of a vehicle, disconnect the ground lead first. This reduces the chances of accidentally causing a short circuit as you work around the battery.
- Never attempt to charge or jump-start a frozen battery. The battery could explode.
- Never attempt to charge or jump-start a maintenance free battery if the charge indicator shows that the battery's electrolytes are low—the battery could explode. It is time to replace it.

Name: _____ Date: _____



Test

BATTERY HANDLING SAFETY

Name: _____ Date: _____

Class: _____ Section: _____

1. How do you protect yourself from acid burns when working with automotive batteries?

2. Why is it important to keep all sparks or flames away from lead/acid batteries?

3. List all the personal, protective equipment required when charging or connecting a battery to power.

4. In what order should you connect and disconnect a battery from a charger?

Steps
a. hook up the leads
b. unhook the leads
c. turn on the charger
d. turn off the charger

Connect	Disconnect

5. What should you do if you are charging a battery and it starts to get hot?

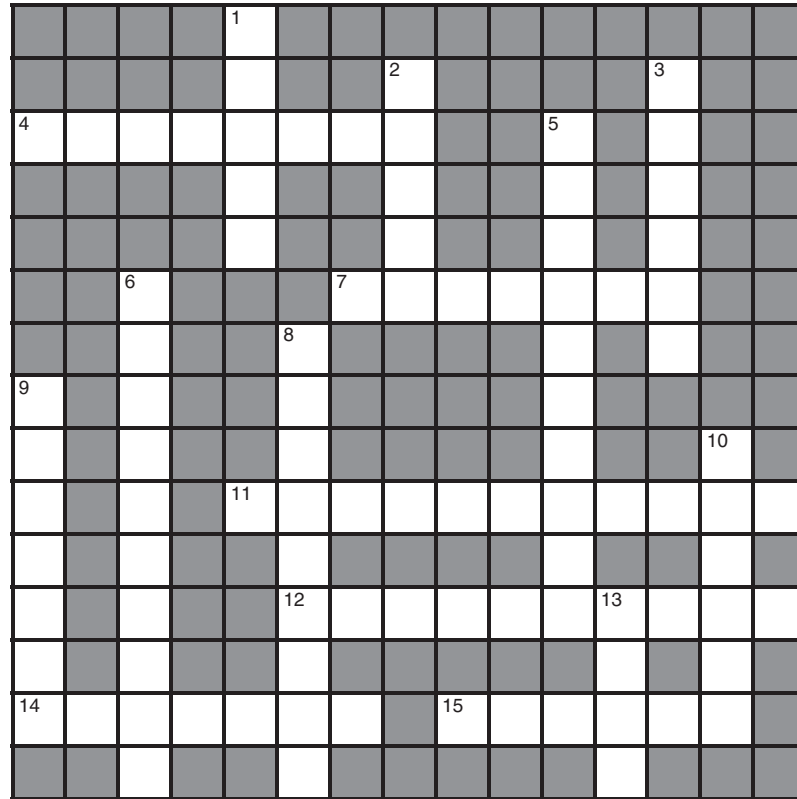
6. When pulling a battery out of a vehicle, which lead should you disconnect first?

7. What could happen if you try to charge or jump-start a frozen battery?

8. What could happen if you try to charge a maintenance free battery that has low electrolyte?

HEADS UP! for Safety

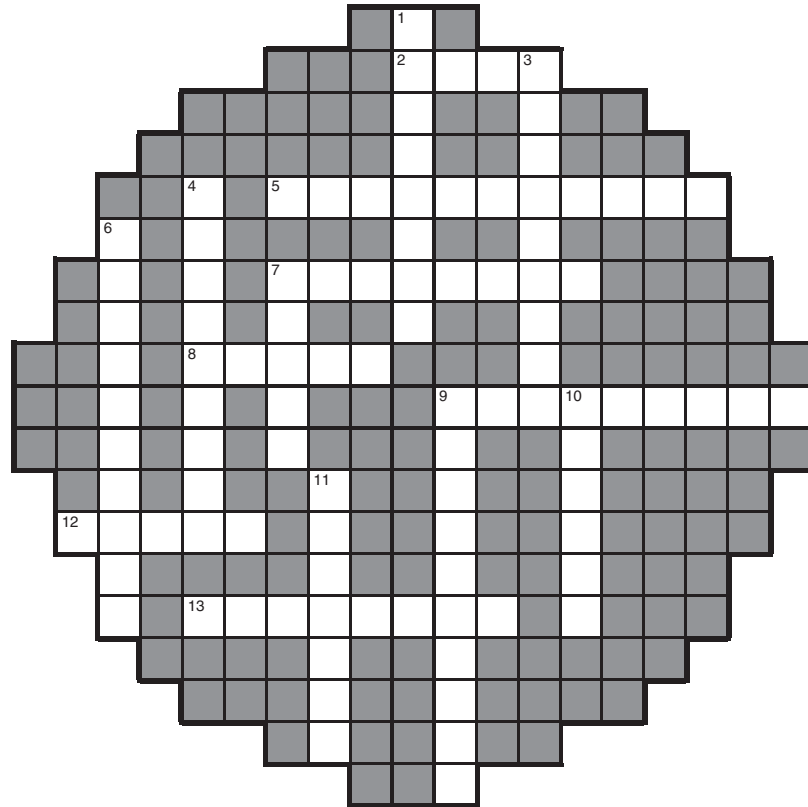
BAND SAW CROSSWORD PUZZLE



- Across**
- 4** Only one of these at a time. (8)
 - 7** A relaxed blade needs some of this. (7)
 - 11** Keeps the blade from wandering. (5,6)
 - 12** Don't use the band saw without this. (10)
 - 14** Don't make adjustments until blade has __. (7)
 - 15** Hands should never be __ with the blade (2,4)
- Down**
- 1** This covers for you. (5)
 - 2** Step on this before stepping away. (5)
 - 3** Not a good idea to reach here. (6)
 - 5** These give you a way out when you're in trouble. (6,4)
 - 6** Your eyes deserve this. (10)
 - 8** No cutting until blade moves like this. (4,5)
 - 9** These can disappear very quickly! (7)
 - 10** Don't do this to small pieces while blade is moving. (6)
 - 13** Backing out of a cut can cause the blade to __ off the wheels. (4)

Name: _____ Date: _____

TABLE SAW CROSSWORD PUZZLE



- Across**
- 2 In relation to the blade, the stock should be here before you release pressure. (4)
 - 5 No one should operate the table saw without this. (11)
 - 7 Cutting this way may cost you. (8)
 - 8 These should always to be well away from the blade. (5)
 - 9 This allows you to apply pressure from a distance (4,5)
 - 12 This covers a lot of teeth. (5)
 - 13 This will get you where it hurts - don't let it! (4,4)
- Down**
- 1 This keeps the wood from binding on the blade. (8)
 - 3 The blade shouldn't be much higher than the ___ of the stock. (9)
 - 4 Never do this to the blade. (5,4)
 - 6 This supports your work when cross-cutting. (5,5)
 - 7 To rip stock, this guides your work. (5)
 - 9 The gift of sight depends on this. (9)
 - 10 To support long pieces, you should have one of these. (6)
 - 11 You must do this to the saw before changing the blade. (4,3)