



TOOLS

Toronto Brigantine Inc

TOOLS

- This lecture is designed to give you a basic idea of the tools you will encounter in our shop.
- We will mainly focus on **identification** and **tool care**.
- Learning **how to use** the tools will come with time.

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Your Hands

- They are the most important and valuable tools you have.
- Protect them from harm by working smart, wearing gloves when necessary, and by not taking chances.
- Without your hands, no other tool is any good to you.

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Good Tool Habits

- “A place for everything, and everything in it’s place.”
 - Keep each tool in its proper place
 - Keep your tools in good condition
 - Use tools only for the job they were designed for
 - Keep tools within easy reach, and where they cannot fall
 - Avoid damaged tools
 - They will damage your work, and can cause injury.

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Hand Tools

- There are many, many types of hand tools:
 - Striking tools (hammers, mallets, sledges)
 - Turning tools (wrenches)
 - Pliers (normal pliers, Channel-locks, Vice-grips)
 - Bladed tools (chisels and planes)
 - Saws (for wood or metal)
 - Abrasives (scrapers, sandpaper, files)

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Striking Tools

- This includes all different types of hammers, sledges and mallets.
- Each type is designed for a specific kind of work, and misuse can damage the tool or your work piece.
- You should avoid striking metal to metal. Place a block of wood between the two pieces if you must use a metal striking tool.

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Hammers

- This is the classic hammer design. It should only be used to drive nails in, and not for hitting things.
- There are two common types of heads: Claw, which is used for removing nails, and Ball Peen, which is used for shaping soft metal and rivets.



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Sledgehammers

- Sledgehammer: Used mainly for destruction. Can be used for less damaging applications if used gently.



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Mallets

- Mallet: Typically made of rubber or wood. Used for assembling tight-fitting pieces, freeing stuck objects, and manipulating other tools like chisels.



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Chipping Hammers

- This is one hammer that you are encouraged to strike against metal.
- It is used to remove rust when preparing a metal surface for painting.



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Turning Tools

- Turning tools are used to turn objects. This will usually be either a bolt, nut or piece of pipe.
- It is important to use the right wrench for a job, or you will end up 'stripping' or 'rounding' what you are trying to turn. This is bad.
- You should also always try to use the proper size wrench for a job, and not just find an adjustable. Adjustables will cause 'rounding' over time as well.

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Open-end Wrenches

- Used for nuts and bolts.



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Box Wrenches

- Also used for nuts and bolts, better than an open-end wrench where usable, but without an open end it won't fit onto all jobs.



- If the wrench has an open end and a box end, it is known as a 'combination wrench'.



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Crescent Wrenches

- A crescent wrench is the term used for an adjustable open-end wrench.
- The term crescent is actually a trademark, but it has become synonymous with all makes of the type.



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Pipe Wrenches

- As the name suggests, it is used for pipes. The jaws are designed to bind onto the piece being turned, and so it will grip any circular object.



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Monkey Wrench?

- You won't find any monkey wrenches around our shop.
- The monkey wrench was used throughout the 19th century and was an early form of adjustable.



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Other Wrenches

Strap Wrench:

- The rubber strap is infinitely adjustable, and is very gentle on the piece being turned.
- Generally used for oil filters and other fragile jobs.



Chain pipe Wrench:

- Used in the same fashion as a strap wrench, but not as gentle and meant for large sections of pipe.

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Pliers

- Pliers, regardless of the type, are used to grip, turn, twist and pull. The many types range from generic, square-nosed pliers to incredibly specialized designs meant for only one type of application.

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Pliers

- Normal pliers come in many styles:

Linesman's Pliers



Needlenose Pliers



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Vise-Grip's

- Vise-Grip is the trade name for a specific type of locking, adjustable plier known as 'wrench pliers'. It has since come to be used when referring to any tool of this type:



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Slip Joint Pliers

- There are two types of slip joint pliers. One which has only two points of adjustment:



- The other type are sometimes referred to as 'Water-pump pliers'. They most commonly go under the name Channel-Locks due to that being a well known and successful brand.



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Adjustable Tools

- Many turning tools and pliers are adjustable. **This does not mean they are 'one size fits all'**.
- Not all sizes will adjust to the necessary dimensions, and sometimes the size of the tool itself is a problem, necessitating going down or up a size.
- If possible, always use a properly sized, non-adjustable tool.



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Bladed Tools

- These tools are used for shaping wood.
- They require some experience to use, and are very fragile if treated improperly. The blade in particular will chip and damage easily if put in contact with the ground.

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Planes

- Used to shape wood, pushed or pulled along the piece shaving a thin layer off.
- Should always be stored with the blade retracted, and in a soft cloth.
- When in use, should be kept laying on its side to prevent blade damage.
- Make sure there are no fasteners in the piece you are planing, as they will quickly destroy the blade.



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Wood Chisels

- Used to shape wood, and to form insets, cutouts and other necessary recesses in wood.



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Chisel Care

- Like planes, the blades of a chisel are easily damaged. Chisels should be stored in a cloth or cover that will prevent the blade from chipping.
- When in use the chisels should be laid down with the blade up, preferably on a soft cloth.



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Cold Chisels

- Used for metal, not wood.
- Can be used roughly if required, as the blade is tough and sharpened readily.



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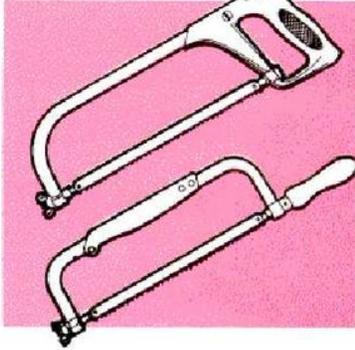
Saws

- Saws are toothed cutting tools.
- They can be designed for wood or metal cutting.
 - A metal-cutting saw can cut wood in a pinch, but **never use a wood saw on metal.**
- The difference is in the teeth: how many, how big, and at what angle they are set.

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Hacksaws

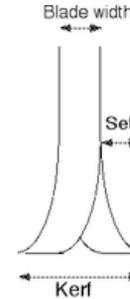
- Hacksaws have blades with lots of small teeth. They are meant for cutting metal.



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Wood Saws

- There are many types of wood saw. They will have larger teeth than hacksaws, and there is typically a large 'kerf' to the teeth.



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Abrasives

- This is a general term for all tools and materials used to 'abrade' an object.
- This can be surface abrasions for smoothing or between coats of paint
- Or it can be material removal.

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Sandpaper

- Different grits of sandpaper are used for different applications. The number is in reference to how many particles of grit there are per square inch. The less particles the bigger they are, and they rougher it is.
- The grits range from about 40 all the way up to past 4000. For our purposes we mostly use in the 80-220 range.

This is 320 grit sandpaper. Look at all the particles in the magnified view.



Scrapers

- Scrapers are used to remove varnish or paint quickly. It is important that the blade is kept sharp.
- You will be taught how to sharpen the blade using a file.



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Files/Rasps

- Files are fine-toothed bars used to file metal or wood. They are used mainly for sharpening tools, but can also be used for shaping of material.



- Rasps are similar to files but they have much bigger teeth. They are used for woodworking only.



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Hand Tool Care

- Hand tools need to be treated gently, and only used for their intended tasks.
- An occasional wipedown with light oil or WD-40 will help prevent surface rust and ensure the tool lasts a long, long time.

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Power Tools

- There are as many power tools as there are hand tools. Each one as specialized as the hand variety.
- Use special care as they can be very dangerous if misused.

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Power Saws



Can you name them all?

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Sanders, Grinders, Planers



Name these too!

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Power Tool Stowage

- **DO NOT WRAP THE CORD AROUND TIGHTLY.**
 - This will damage the cord and either cause injury or lead to an early demise for the tool.
- If the tool has a case, put it back in the case tidily when you are done. Have nothing sticking out.

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Measuring Tools

- Tapes/Rulers: For measuring linear distance.
- Calipers: For measuring distances that would be hard to with a tape, either because of the shape or size.



- Squares: For measuring and laying off angles.



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Metric vs. Imperial

- You will encounter both metric and Imperial tool sizes in the shop. (Metric in millimeters, Imperial in inches and fractions such as 3/8")
- European and Asian tools and equipment use metric, Americans use Imperial, and the Canadians use both.
- Ensure you are using Metric tools with metric fasteners, and Imperial tools with Imperial fasteners. Mixing will damage tools and your work.

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Fasteners

- The generic term for all pieces used to fasten parts together.
- There are many different types, each with their own tools to use them.
- Do not use the wrong tool with the wrong fastener, or even the wrong size.

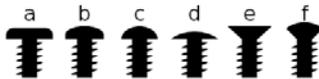
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Screws:

There are many, many types of screws. The three most common drive types are:



There is also a huge variety when it comes to head type, shank size, thread type, etc. Know what your job is and find a fastener that will work, there is a type for every application



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Screwdrivers

- There are screwdrivers for every type of screw.
- Both screwheads and screwdrivers come in multiples sizes, depending on what the actual size of the screw is. Use the right size.
- Do not use screwdrivers for other applications, like as a marlinespike, as this will bend them



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Nuts and Bolts

- Nuts and bolts are excellent fasteners. They are strong, secure, and easy to remove when the time comes.
- They are also relatively expensive, so they are not used in every application.
- They are the only fastener that will join metal to metal, though a hole needs to be pre-drilled.

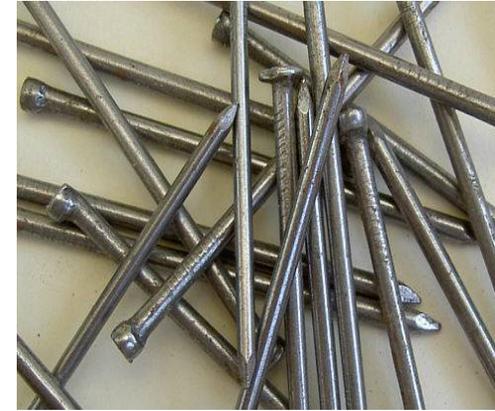


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Nails

Nails are simple and cheap. They are also hard to remove without damaging the material and they do not hold well over a long period.

Because of this we try to avoid nails, especially onboard the ships.



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Drill Bits

- Drill bits are as varied as the fasteners.
- There are 3 main types: Metal, Wood and Concrete.
- This is a 'twist drill' it is the classic drill-bit. It is meant for metal but can be used in wood.



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Drill Bits

- These are all wood bits. Notice the spur/point in the front of each one. If used in metal or concrete this will break off and make it useless.
- Each type has its pros and cons. Learn them as you are able.

Forstner Bit



Spade Bit



Brad Point Bit



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Drill Bits

- These are masonry bits. Do not use them for any other application as they will damage themselves and the work.



- Notice the 'Hammerhead' which bores through the masonry.



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Clamps

- Used to hold material while working on it, or while gluing.
- Left to Right: Bar clamp, C-clamp



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Rigging Tools

- Tools used for rigging work are not to be used for other jobs.
 - They are very specific to their task.
 - They are fragile if improperly used.
 - They are expensive.

From left to right:

- Large Serving Mallet
- Small Serving Mallet
- Splicing Fid
- Swedish Fid
- Heaving/Seizing Mallets



Conclusion

- Most of the job is knowing which tools to use. Using the right tool in the right way will make your work go a lot easier, safer and with a better end result.
- Please make sure you treat the tools with respect, and put them back where they belong so the next person can find them.

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