Manual Lathe Orientation

* **Never** operate machine without mentor supervision.
* **Always** were safety goggles while operating machine.
* Make sure hair and long sleeves are tied back or rolled up.
* Remove any jewelry (necklaces, rings).
* Have a machine plan ready and approved beforehand.
* Have any prep work done before hand (special tools and setups).

During the orientation all students will be required to fill out a machining plan covering the tools, and machining operations that take place.

1. Grab a piece of stock

Place the piece of stock in to the appropriate collet or the three jaw chuck

* Discuss differences between the lathes
* Discuss the 3 and 4 jaw chucks, uses, setup
* Collets where they are located, uses
* Securing stock, (important to mention the run out behind the machine).

1. Select an appropriate tool

Have the student(s) set up all the necessary tools that will be needed for all the intended operations

* Discuss different tools and their setups (important to mention height requirement for tools)
* Demonstrate use of tool holders and how to change tools

1. Set up lathe

Load and orientate the first tool on the tool post making sure the check the height of the cutting edge before starting work

* Demonstrate how to work the tool post (loading, unloading and rotating)
* Demonstrate use of the carriage hand wheel and cross slide
* Demonstrate the use of the compound rest
* Discuss High and Low gear along with how to adjust spindle speed

1. Basic Turning

Set up the dial indicator and during the first turning pass demonstrate the use of the power feed.

Next do another pass but allow a student to run the machine with power feed at a much slower speed.

Then have another student run a short pass by hand to demonstrate the difference in finish between hand and power feed.

Use the compound rest to also put a small chamfer on the end of the stock.

* Discuss feeds and speeds for the lathe (forward, reverse, hi/lo gear, brake)
* Working the power feed (never turn on while running)
* Working and reading the quick change box (ok to change while running)
* Discuss dial indicators
* Discuss thread dial (better to cut threads with CNC and recut or follow threads with the manual lathe)

1. Tail stock

Change the tailstock over to have the drill chuck center, use an appropriate dill bit to dill out the center of the stock.

* Discuss different live centers
* Demonstrate how to change live centers
* Drilling with live center

1. Deburing/scouring

Have the students grab a deburring tool along with a scouring pad, sandpaper and a file and go over appropriate uses of each. (a part is never done until deburred).

* Demonstrate where to find deburring tools, files, sand paper, scouring pads

1. Clean up