First Activity - Getting acquainted with the lathe

Goals and objectives:

- Set up for spindle turning
- Practice basic tool cuts
    - Roughing out
    - Smoothing
    - Beads & Coves
    - Parting & sizing

Process:

Mount the Blank

- With a short piece of practice stock mark the center on both ends
- Mount on the lathe "between centers," that is with a spur drive installed into the lathe headstock and a live center mounted in the tailstock
- Secure the work piece by securing the tailstock, advancing its quill until the spur drive on the other end is firmly imbedded.
- Lock the tail stock quill by tightening its small locking lever
- Set a lathe speed of approximately 1800 RPM (see instructor for details)

Turn the blank round (Roughing out)

- Advance the tool rest to about ¼ inch from the face of the wood
- Set the tool rest so that the cutting edge of the tool is at about centerline of the lathe
- Using the spindle roughing gouge practice making the spindle round, straight and without undulations
- Due the activity with left and right hands working toward both ends of the work piece

Plane the blank smooth

- Using the skew chisel plane the blank so it is as smooth and straight as possible
- Raise the tool rest so that the cutting edge of the tool is about 11:00 o'clock ion the face of the wood – keep the tool rest close to the wood
- Work both left and right

Turning Beads (Two ways)

Turning coves (Shallow fluted gouge)

Parting cuts

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Turning a Bottle Stopper

- Use a special bottle stopper screw chuck
    - Mount chuck on lathe headstock
- Drill 23/64 centered hole is blank with the drill provided
- Screw the blank on to the screw chuck
- Advance the tailstock for additional support
    - Turn the desired shape
    - Remove the tailstock and complete the end
- Sand and finish
- Remove from screw chuck and insert a two inch long 3/8 dowel and glue in place with yellow glue
- Add a drilled cork stopper and glue into place with yellow glue
- Trim the dowel flush with the end of the stopper and sand flat

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Screw Driver

Option A

Purchase a commercial screw driver kit and follow the included instructions

Option B

- Purchase an inexpensive screw driver at a local hardware store and remove the metal sleeve
  - Use a coping saw to cut off the plastic and remove the parts
- Mark a blank with a center punch and drill a hole to snugly accommodate the insert
- Drill a smaller, centered hole to allow for the length of the drill bit to fit into the handle
- Glue the insert into place with medium CA glue
  - After the glue is set, carefully flood the end grain around the insert with thin CA glue and allow to set
- Mount the drilled blank on the lathe between centers
  - Turn a tapered drive cone from soft wood
  - Place the tapered drive cone in the headstock
  - Mount the screw driver blank between centers with the insert positioned on the drive cone
- Turn a pleasing shape that fits your hand
- Sand and finish
- Part off and assemble the driver

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Mallet

- Purchase a 3 x 3 x 12 straight grain hardwood such as maple, ash or oak (Ball bat blanks work well)
- Mount between centers and rough out
- Turn a handle and mallet head being sure to fit your hand
- Sand to 180 grit, do not finish
- Part off

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Turning an American Slim Pen

Pen turning requires three separate groups of activities:

- Preparing the blank for turning
- Turning the pens
- Assembling the kit
-

Supplies required are:

- Pen blank ¾ x ¾ x 5 inches, straight grain hardwood
- 7mm American Slim pen kit & instruction sheet
- 7 mm brad or bullet point drill bit and drill
- 7 mm pen mill
- Pen mandrel and bushing for 7mm Am. Slim kit
- Medium thickness Cyanoacrylate glue (& accelerator)
- Fixture for hold blank vertical while drilling
- Pen to mark blank alignment
- Sanding supplies
    - 80-100 grit for roughing brass tubes
    - 120-600 for sanding finished pen
    - 0000 steel wool
- Finish
    - Friction polish
- Turning tools
    - Spindle Roughing Gouge
    - (3/8 shallow fluted gouge)
    - (Skew chisel)
- Finishing supplies
    - Sand paper various grits to 600
    - Friction polish or other finish
    - Cloth to apply polish
    -

Preparing the blank for turning

- Cut blanks to length
    - Measure brass tubes and mark on wood blank
        - Add 1/8 inch to each length
    - Cross cut blanks squarely
    - Mark mating ends for realignment later
- Insert brass tubes into blanks
    - Rough the surface of each tube with 80-100 grit sand paper
    - Coat each tubes with medium thickness Cyanoacrylate glue
    - Twist the tubes into the wood blanks from the mating (marked) ends
        - Press the tubes slightly below the wood surface
    - Allow to dry or add accelerator
- Square blank ends for turning
    - Using a 7mm pen mill square each end of each blank
        - Assure the blanks are firmly clamped
        - Assure that the brass is exposed and shiny at each end when completed
        - (Do not over cut the ends as the pen length will be affected)

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Turning the pen

- Assemble the blank on the mandrel
    - Place one 7mm bushing on the mandrel followed by one blank
        - The reference mark should be facing the tail stock
    - Insert a second 7mm bushing and add the second blank
        - The reference mark to face the head stock (and the other reference mark)
    - Add the third 7mm bushing and secure in place with the brass end screw.
    - Tighten completely
- Insert mandrel into lathe headstock
    - Clean the lathe's taper and the matching Morris taper on the mandrel
    - Insert into the lathe and bring up the tail stock
    - Tighten the tailstock only enough to engage the live center point into the dimple on the mandrel's end
        - *Over tightening will damage the mandrel and cause the pen to be turned oval*
- Rough turn using the spindle roughing gouge
- Finish turn the pen
    - Reduce dimensions until approaching the diameter of the bushings
    - Leave a small amount of wood proud of the bushing to allow for sanding
    - Sand skipping no grits
        - Keep sand paper moving at all time to minimize circular scratches
        - After each grit, turn lath off and re-sand with the grain
        - Complete sanding with 0000 steel wool
- Apply appropriate finish
    - Friction polishes
        - Use small square of shop cloth or cotton
        - Apply a thin coat allow to dry
        - Increase lathe speeds and burnish until finger get warm
        - Reapply if desired

Assemble the Pen

- Remove the two blanks from the lathe keeping them in exact order
- Assemble the writing tip
    - Insert the pen tip into the far left blank end
    - Press into place squarely with pen press or wood-faced vice
    - Insert the twist mechanism into the other end of the same blank
        - Brass end first
        - Press into the blank until the marking band is slightly proud of the blank
        - Test the position by insert the pen refill and twisting to full extension
        - Adjust the fit by repressing the mechanism
        - *(Do not over press as removal is very difficult)*
- Assemble the top section
    - Insert the clip into the cap and press into the far right blank end
- Complete pen assembly
    - Place decorative center bank over the twist mechanism
    - Press the top portion of the pen into place

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Bud Vase

Goals & Objectives

- Learn to turn a basic “bead & cove” shape
- Practice transferring dimensions
- Complete and part off a project

Materials & Supplies

- Wood blank 3x3x8
- Four-jaw chuck
- Spindle Roughing Gouge (SRG)
- Shallow fluted gouge
- Drill bits and Jacobs chuck
- Parting tool & calipers
- Sand paper & finish

Process

- Center & mount wood blank between centers
- With the SRG rough turn wood blank round
- Mount the blank in a four-jaw chuck
    - Transfer the tendon diameter of the selected chuck to the tail stock end of the wood
    - Transfer the tendon length the same end of the blank
    - Cut a tendon for the chuck as marked
    - Transfer the blank to the chuck
    - Bring up the tail stock for support
    - Re-true the blank
- With the parting tool and calipers, transfer major dimensions to the blank from drawing
    - Abut the drawing dimensions to the tailstock end of the blank
- Turn only the top 2/3 of the shape beginning at tailstock end of the lathe
- Drill depth hole from tailstock end with the Jacobs chuck and drill
- Complete shape reducing base diameter to final dimension
- Sand and finish
- Part off

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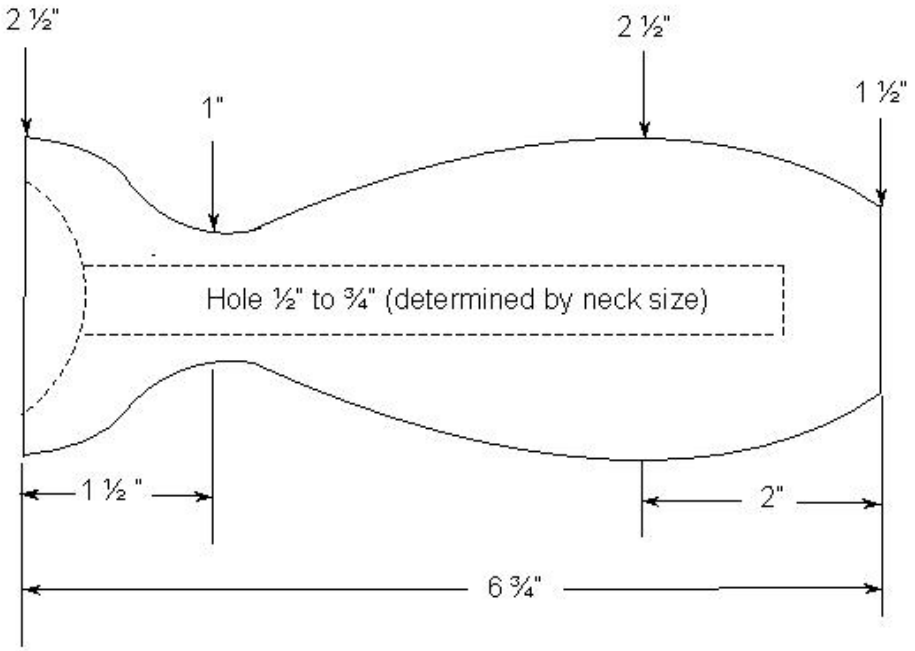
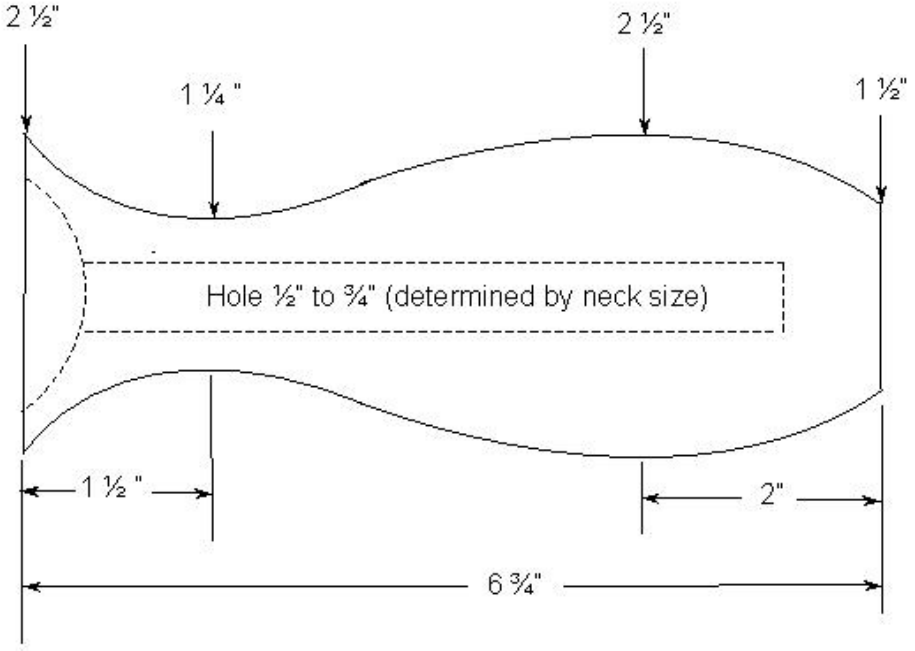
Bud Vase 1



Bud Vase 2



Building a Candle Stick

1. Cut stock
    a. 3.75 x 3.75 x 2.25 (base)
    b. 2 x 2 x 11 (shaft)
2. Turn base
    a. Mount stock
        i. Locate center and mark
        ii. Flatten opposite side
        iii. Prepare a faceplate/glue block by flattening glue block
        iv. Trim corners of base stock
        v. Glue base to glue block on the lathe
    b. Using a Forstner bit, drill 1 inch diameter hole .75 inches deep
    c. Mark a circle on the base of 1.825 inches (do not turn inside this line)
    d. Turn base to design
    e. Sand and finish on lathe
    f. Part off
    g. Finish bottom
        i. Turn a one inch tendon on the glue block
        ii. Reverse base onto tendon and advance the taqil stock for additional support
        iii. Clean up base, sand and finish
3. Turn shaft
    a. Mount between centers
        i. Locate center on both ends and mark
        ii. Mount with spur drive and live center
    b. Turn to design
        i. Mark out major transition onto stock with pencil
        ii. Using parting tool and caliper, transfer appropriate dimensions
        iii. Turn to design
    c. Complete shaft
        i. Turn a 1 inch tendon in base end
            1. make it no more than .625 in length
            2. slightly under cut the base as you turn the tendon
4. Complete candle stick
    a. Glue shaft into base with yellow glue
    b. Using special candle bit, drill recess in top on drill press

Turning guidelines:

- Always work from tailstock end of lathe towards headstock
- Make stock round with the spindle roughing gouge
- Complete additional turning using the shallow fluted gouge

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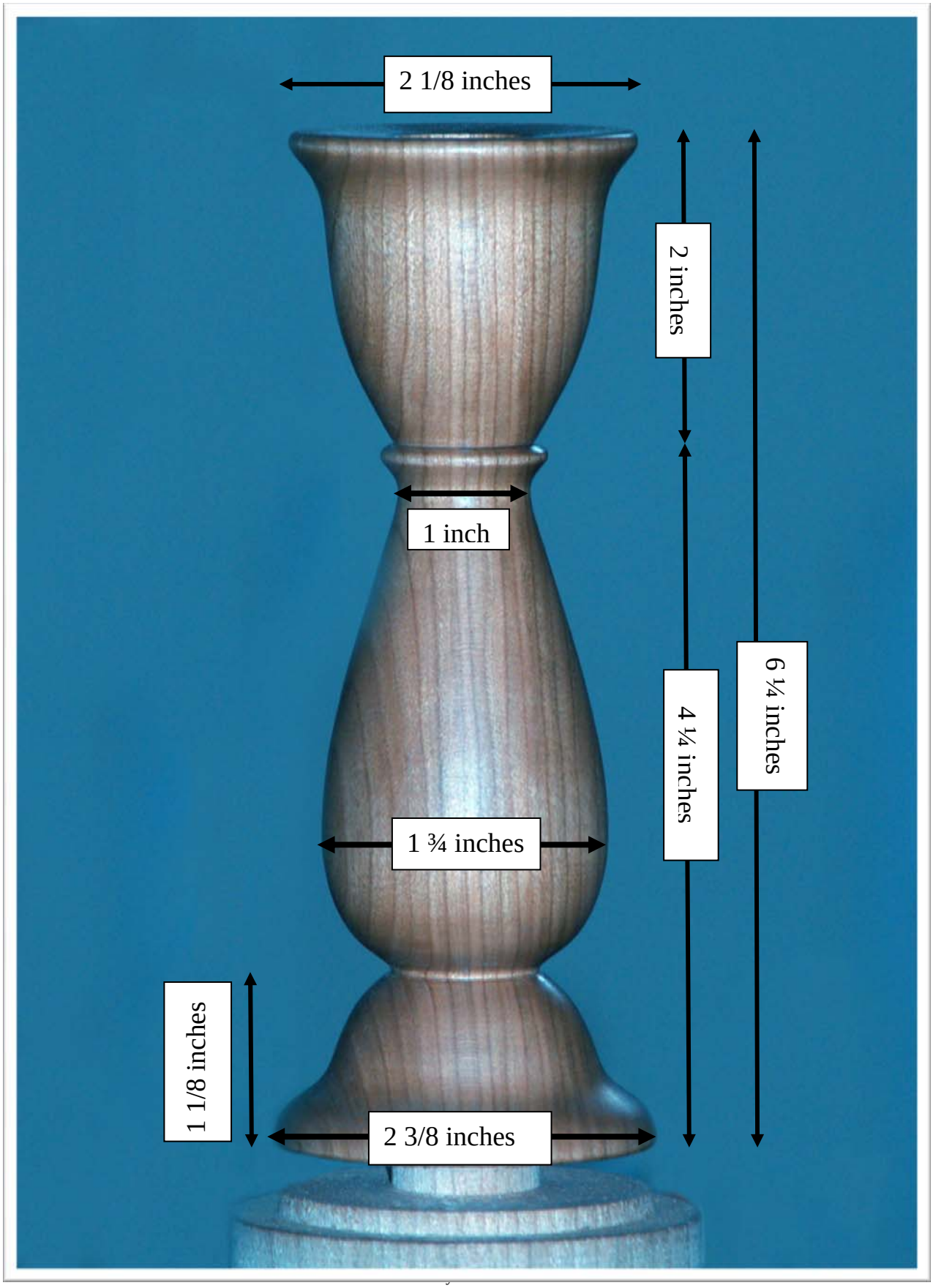

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Lathed

Letter Opener

Prepare the Blank

1. Select a 1 1/2 " X 1 1/2 " X 12 " blank. Draw diagonal lines at each end to locate the center. On the end of the stock that will be the blade, draw a line through the centerpoint perpendicular to the grain. (For reference, see the Blank Preparation drawing.) Now , use a bevel gauge to transfer this line to the other end of the blank.

Note

Aligning the offset centers perpendicular to the grain ensures that the face grain will be aligned with the face of the blade. It also allows you to follow the fibers of the wood and avoid chipping the edges of the blade as you turn.

2. Mark two offset centerpoints on this perpendicular line, 3/8 " on either side of true center, on both ends of the blank. Next, drill a 1/8 " hole 1/8 " deep at each of the three centerpoints on the handle end of the blank. Then, punch the three points on the blade end using a center punch.

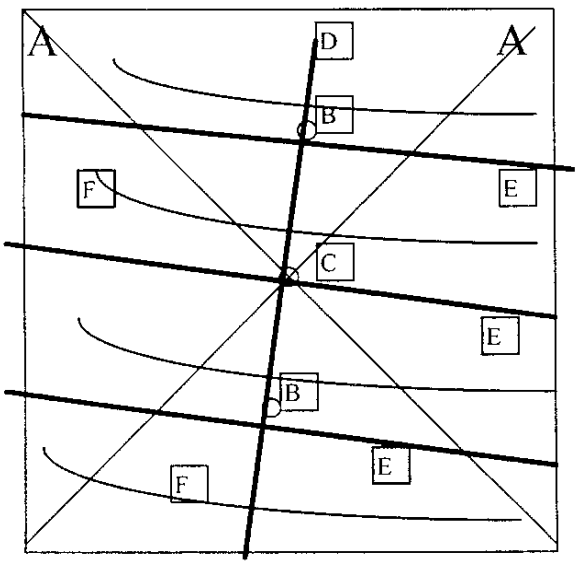
3. Cut 1/32 "- deep kerfs in the handle end where shown on the Blank Preparation drawing to seat the centerpoints in the spur center.

Note

Mount and seat all three centerpoints before turning

Mount the blank on the lathe in the true center position.

BLANK PREPARATION End View



A- Lines to find center

B- Offset centerpoints

C- True centerpoint

D - Offset line perpendicular to growth ring

E - 1/32" deep kerfs to seat spur center

F - Annual growth rings

B-C C-B 3/8 " between centerpoints

Turning the Opener to Shape

1. Mount the blank at the true center, and turn it to a 1 " diameter cylinder, leaving the ends of the stock square. (See step one of the four step drawing.)

2. Using the attached full sized template, cut in at each point shown in step two of the four step drawing to establish the diameter.

3. Turn the handle part to its finished shape. Then turn the blade to form its taper, as shown in step three of the four step drawing.

Note

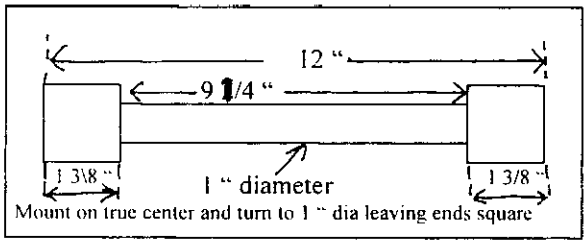
For now , leave at least a 1/4 " diameter at the end of the handle. Also stop the taper 1/4 " from the true er ' of the blade. This is for support.

4. Remount the blank at one of the two sets of offset centers at each end, making sure that both ends move in the same direction. Begin turning the face of the blade only. Do not touch the handle. Switch to the other pair of offset centers and turn the other side of the blade.

Note

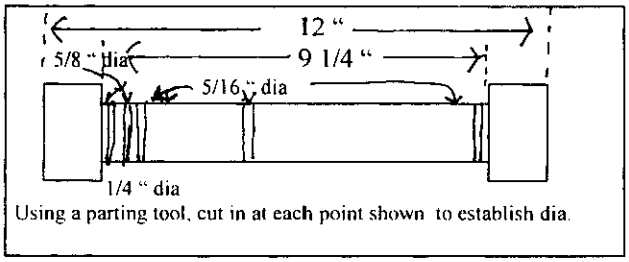
Switch back and forth to each side of the blade to remove the material evenly on the blade.This does require mounting and remounting the opener , but it produces much better results.

Step One



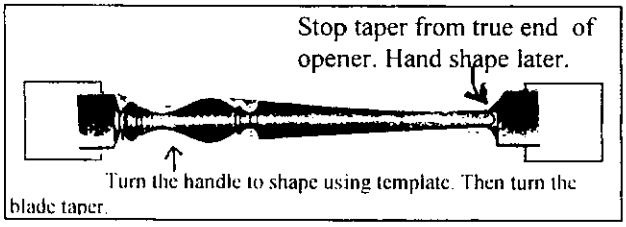
Mount on true center and turn to 1 " dia leaving ends square

Step Two

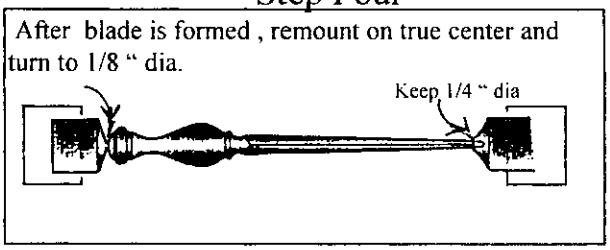


Using a parting tool, cut in at each point shown to establish dia.

Step Three



Step Four

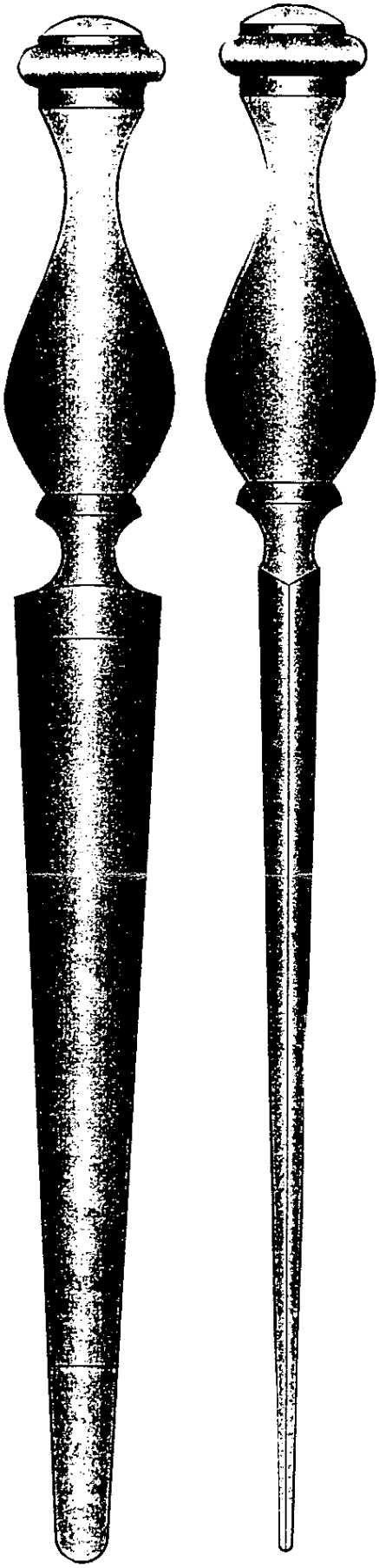


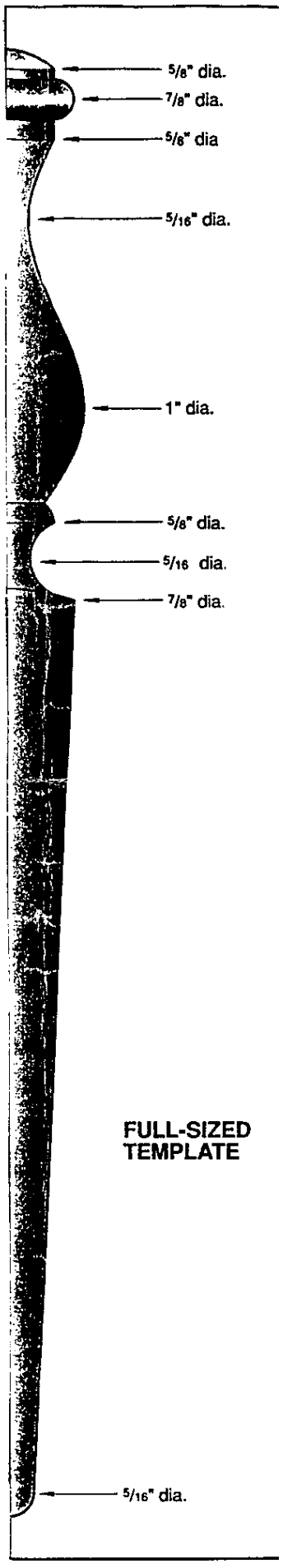
Finishing Touch

1. Once you've formed the blade, remount the stock on the true centers, and finish-sand the handle. Next turn the excess waste at the handle end, working this diameter to 1/8 ". Then remove the turning from the lathe, and bandsaw the off the ends.

2. File and finish-sand the 1/8 " waste from the handle end. Next, sand the waste from the blade tip, forming it to shape as you go. Now, finish- sand the entire blade, being careful to maintain its turned form.

3. Apply your choice of finish. ENJOY YOUR LATHED LETTER OPENER





FULL-SIZED TEMPLATE

Resource List

Wood Turning major specialty suppliers

Craft Supplies, USA
1287 East 1120 South
Provo, UT 94606
1-800-551-8876
www.woodturnerscatalog.com

Packard Woodworks
PO Box 718
Tryon, NC 28782
1-800-683-8876
www.Packardwoodworks.com

The Cutting Edge
7123 SouthWest Freeway
Houston, TX 77074
7-800-790-7980
www.cuttingedgetools.com

General woodworking dealers (local)

Rockler Woodworking
541 Contra Costa Blvd
Pleasant Hill, CA 94523
1-925-521-1800
(10% discount on supplies if you mention you are MDAE student)

Woodcraft of Dublin
6044 Dougherty Road
Dublin, CA
925-875-9988
(15% discount with student discount card)

Inexpensive turning tools and pen kits

Penn State Industries
9900 Global Road
Philadelphia, PA 19115
1-800-377-7297
www.pennstateind.com

WoodTurningz, Inc
17408 Tiller Court
300
Westfield, IN 46074
1-888-736-5487
www.woodturningz.com

Arizona Silhouettes
660 East 18th Place
Suite B
Yuma, AZ 85365
1-928-329-9466
www.arizonasilhouette.com

Inexpensive grinding wheels, drills, etc

KBC Tools
1751 Sabre
Hayward, CA 94545
1-510-732-5500
www.kbctools.com

Enco
400 Nevada Pacific Highway
Fernley, NV 89408
1-800-873-3626
www.use-enco.com

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