

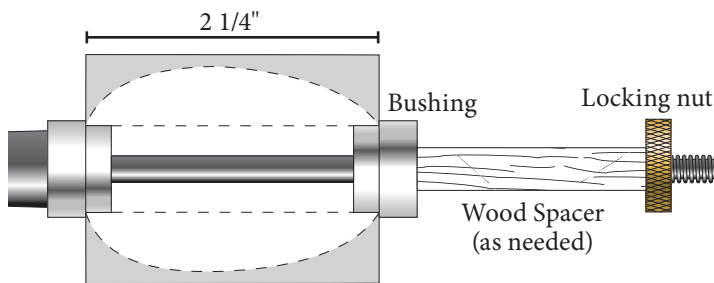
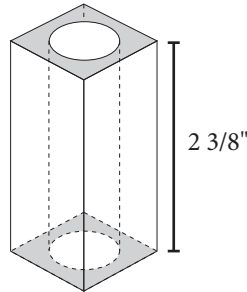
Turning a Mini Kaleidoscope

Supplies Needed

- 13/16" Drill Bit
- 2" x 2" x 2 3/8" Blank
- Pen Mandrel
- Set of Bushings
- Sandpaper/Finish
- Drill or Drill Press
- Pen Press or Clamp
- Eye and Ear Protection

Turning the Mini Kaleidoscope

1. Mark the center of the blank and drill a 13/16" diameter hole through the center.
2. Square the ends of the blank to ensure a proper fit when assembled. Final length should be 2 1/4".
3. Mount the blank on the pen mandrel with bushings in place as shown. Turn the blank round.
4. Turn to shape leaving the ends of the wood blank slightly larger than the bushings.

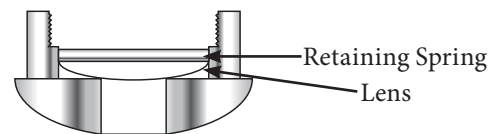
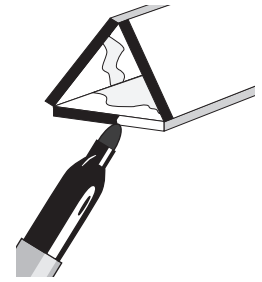


4. Sand and finish.

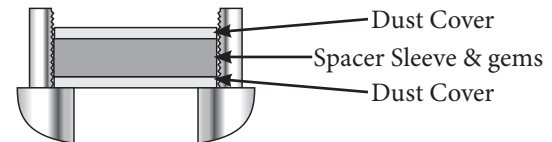
Assembly

1. Layout the parts as shown below. Refer to drawing as needed during assembly. See Diagram 1.
2. *Assembling the front surface mirrors.* Each piece of mirror is marked with a line on one side. This mark indicates the outside of the mirror and should be outward facing when mirrors are assembled. Carefully place the three mirrors inside the brass tube forming an equilateral triangle. The mirrors should fit securely. If necessary, wrap tape around the mirror assembly until they fit securely in the brass tube.

3. Color the ends of the mirrors with a permanent black marker to prevent stray light from interfering with the image.
4. Position the viewing cap as shown with the eye cap facing down. Position the lens in the recess with the convex (radiused) side down and flat side up. Place the retaining spring on top of the lens. Use the eraser end of a pencil to carefully press the retaining spring into the recess to secure the lens in place.



5. Peel the protective paper from the clear dust cover and position it in the recess inside the threaded end cap.



6. Press the cardboard spacer into the end cap until it registers firmly against the dust cover.
7. Select the gems you like and fill the cardboard spacer with gems until half full. Do not overfill as it results in the gems not being able to tumble freely while viewing.
8. Remove the protective paper from the remaining dust cover and position it on the end of the cardboard spacer.
9. Thread the brass tube (with mirrors inside) into the end cap (with gem and dust covers in place). The tube will seat against the dust cover securing all parts in place.
10. Insert the brass tube assembly into the wood blank and thread the viewing cap assembly onto the end of the brass tube. Tighten securely.

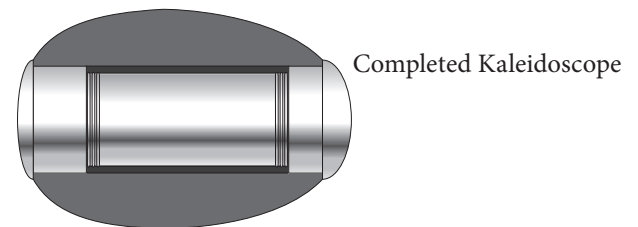


Diagram 1

