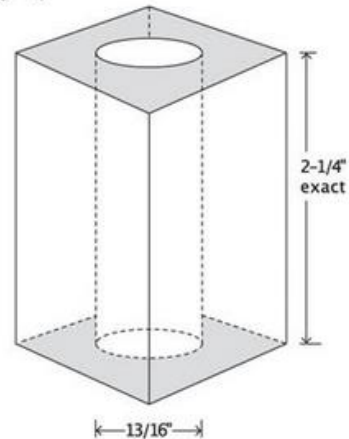
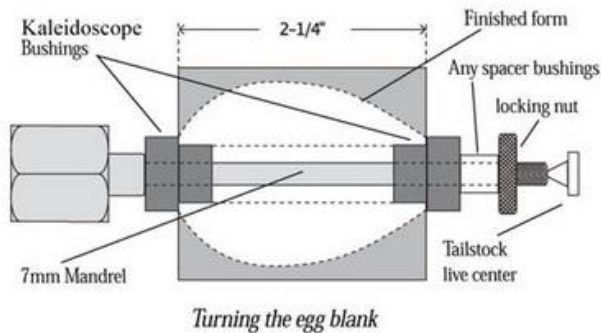
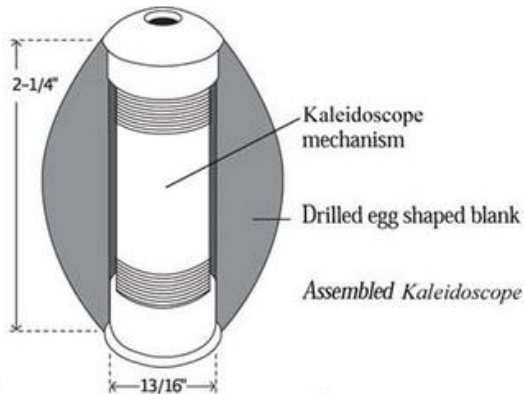


Kaleidoscope Kits Assemble Instruction

Kaleidoscope kits offer an easy to make, unusual, and unique kaleidoscope design- The kit consists of a complete kaleidoscope mechanism that fits into a 2-1/4" deep hole drilled to a 13/16" diameter in an egg-shaped blank. The eyepiece and endpieces are designed to easily screw together for quick and flexible assembly and dis-assembly. An optical lens is included to allow for focusing on the viewing gems.



Turning an Egg Blank

A proven procedure for turning a Kal-eggscope blank to form is detailed below:

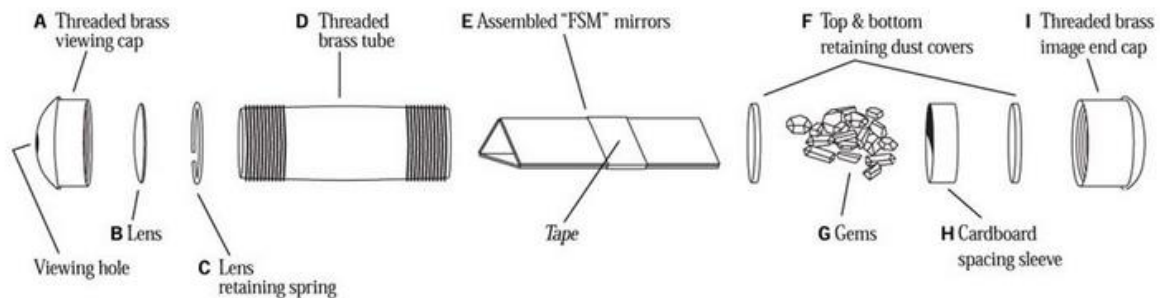
- 1 Cut your wood to a cube 2 x 2 x 2-1/4". It is important that the length in the drilled direction be exactly 2-1/4" in order for the mechanism to fit properly.
- 2 Determine the center of the square and drill a 13/16" hole completely through (use 13/16" Forstner Bit)
If the wood is going to be left natural, you should drill through the end-grain.
- 3 Use Kaleidoscope mandrel bushings to mount and turn the blank on your lathe.
Kaleidoscope bushings are step bushings that slide onto most 7mm pen-making mandrels
- 4 We suggest that the maximum outside diameter of the egg after turning should be between 1-3/4" and 1-7/8".

Kaleidoscope Stands

Kaleidoscope can be presented in a variety of attractive formats. You can turn a small candle stick type of stand or use one of Penn State's pre-fabricated stands shown below.



Gold Finish Stand 3/4"



1 Account for all parts shown in the figure above. Refer to this figure for positioning and assembly of all components.

Installing the lens in the viewing cap

2 Position the viewing cap **A** with the eye-hole facing down. Drop the lens **B** into the recess inside the cap with the convex side down, flat side up as shown. Place the lens retaining spring **C** on top of the lens. Use a pencil eraser to hold and a blunt instrument to push the spring down in the recess to secure the lens in place.



Assembling the Image End

3 Position the threaded end cap **I** with the open threaded end facing up. Peel the protective paper off the retaining dust cover (**F** bottom), and position it to seat on the bottom of the image end cap.

4 Insert the cardboard spacing sleeve **H** into the end cap so that it seats firmly on the bottom retaining dust cover. Press firmly to force the sleeve to seat completely on the bottom dust cover.

5 Insert the Gems **G**. The gems should occupy no more than 1/2 of the space in the image end cavity. A variety of gems are provided to allow for a selection that pleases the user.

Note: Putting too many gems (i.e. all provided) into the cavity may cause the objects to jam in the cavity and not tumble freely. If they do not tumble after final assembly, remove selected gems to allow for the remaining gems to tumble freely.

6 Remove the protective paper from the remaining dust cover (**F** top), and position it on top of the spacing sleeve to completely enclose the gems in the image cavity.

Viewing cap assembled with lens and retaining spring

Assembling and installing the F.S.M. (front surfaced mirrors)

7 The three pieces of mirror are marked with a black "X" or a line on one side. This indicates the back side of the mirror and should be placed away from the center when assembling these pieces.

8 Place the three mirrors inside the threaded brass tube **D** one-by-one forming an equilateral triangle **E**. See diagram below. As usual, when handling cut glass, use caution not to cut your fingers or chip the glass.

Mark eyepiece edge of mirrors with black marker ink

Edges form equilateral triangle inside



9 The mirrors should fit snugly inside the tube. If the mirrors slide freely inside the tube wrap additional tape around them to fit snugly.

Final Assembly

10 Thread the brass tube (with mirrors inside) into the image end cap (with gems and dust covers installed). The tube will bottom on the top dust cover to secure all of the components inside.

11 Insert the brass tube & image end cap assembly into the 13/16" hole drilled in the egg blank. Screw the assembled viewing cap (with lens and retaining spring) onto the other end of the tube. Be careful to position the end cap with the eyehole down so that the lens does not fall out. Tighten securely over wooden body. The viewing tube will be secured between the lens inside the viewing cap and the dust cover in the image end cap. *Enjoy the view!*