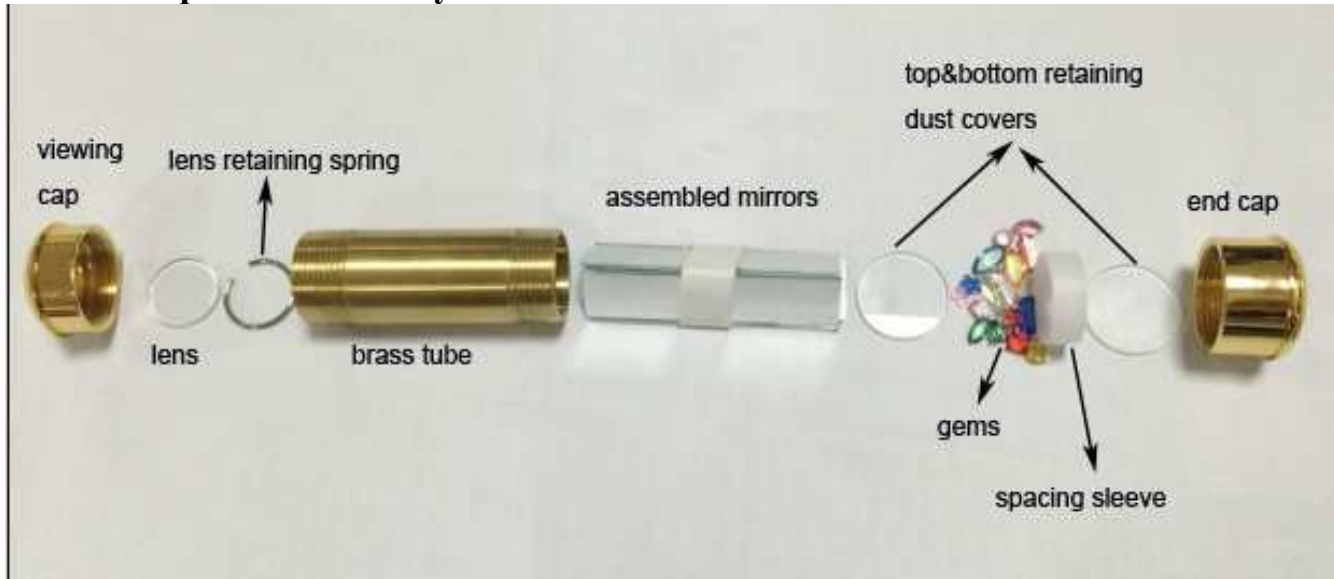


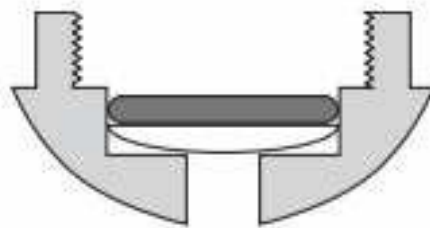
## Kaleidoscope Kits Assembly Instructions



1. Refer to the above figure for positioning and assembly of all components.

### Installing the lens in the viewing cap

2. Position the viewing cap with the eye-hole facing down. Drop the lens into the recess inside the cap with the convex side down, flat side up as shown. Place the lens retaining spring 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.



*Viewing cap assembled with lens and retaining spring*

### Assembling the End cap

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

4. Insert the spacing sleeve 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. The gems should occupy no more than 1/2 of the space in the end cap 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, and position it on top of the spacing sleeve to completely enclose the gems in the end cap cavity.

### Assembling and installing the mirrors

7. The three pieces of mirror have very thin protective film on one side. These are front side, please pull the film off before using.

8. Place the three mirrors inside the brass tube one-by one forming an equilateral triangle. 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**

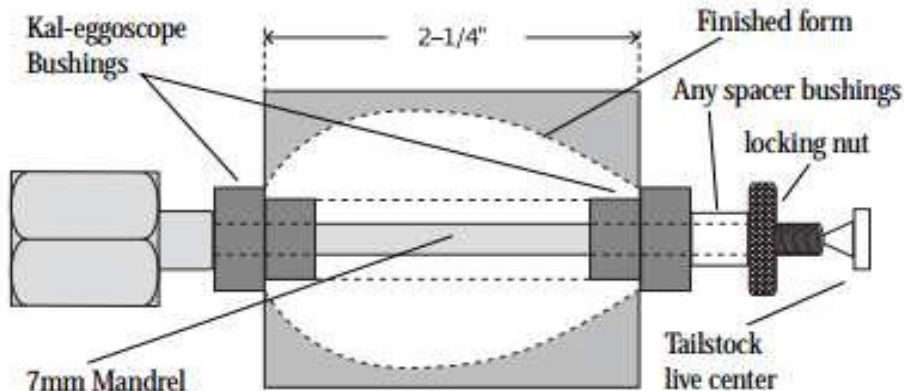
10. Thread the brass tube (with mirrors inside) into the end cap (with gems and dust covers installed). The tube will bottom on the top dust cover to secure all of the components inside.

11. Insert the brass tube & the 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!

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.

**Using Pre-formed Egg Blanks**

Several options are available for those who want to make Kaleidoscope egg. A pre-drilled and formed 2-1/4" wooden egg blank is available for anyone who wants to forego the process of turning the egg form on a lathe. These blanks can simply be painted. When painting is finished, the Kaleidoscope mechanism is inserted into the form and the scope is complete. Alternatively, the blank can be carved, stained or lacquered prior to inserting the Kaleidoscope mechanism.



*Turning the egg blank*

### Turning an Egg Blank

A proven procedure for turning a Kaleidoscope blank to form is detailed below:

1 Cut your wood to a cube  $2 \times 2 \times 2\text{-}1/4$ ". It is important that the length in the drilled direction be exactly  $2\text{-}1/4$ " 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 the Kaleidoscope bushings to mount and turn the blank on your lathe. The 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  $1\text{-}3/4$ " and  $1\text{-}7/8$ ".

