



# Bottle Microscope

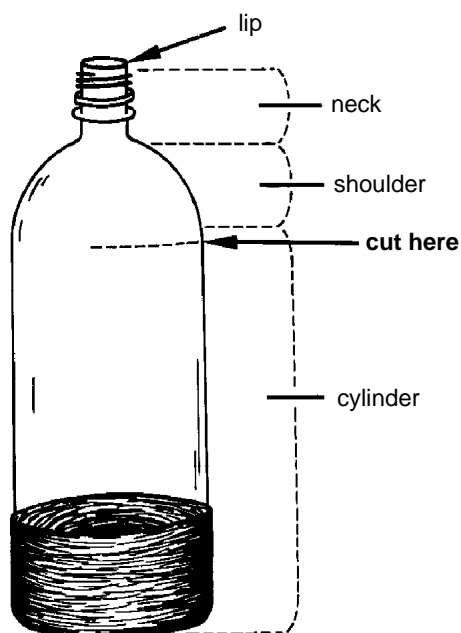
## Materials

- 1-liter soda bottle with cap
- marking pen or grease pencil
- razor blade in safety holder
- scissors
- propane torch
- nail
- 17-20 mm diameter Pyrex test tube
- aluminum foil
- glue
- bamboo cooking skewer
- double-stick velcro
- two #3 rubber stoppers
- 35 mm opaque film can with lid
- two 9 cm plastic petri plates
- 22-29 mm diameter 5X lens

## Prepare the bottle

Carefully peel off the labels after filling the bottle with hot water. Peanut butter works well for removing stubborn glue remnants.

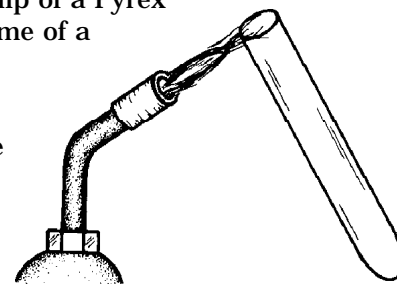
Cut the bottle just below the shoulder.



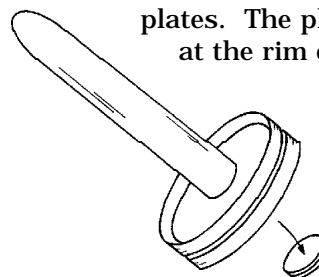
## Create a microscope stage

Carefully heat the lip of a Pyrex test tube in the flame of a propane torch.

Open your petri plate and place the sides together, so the rims are facing outward. Using the heated test tube, melt a hole



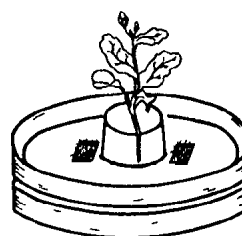
in the center of the back-to-back petri plates. The plates will fuse together at the rim of the hole.



You can then make a dissection stage, and a transmission stage, for viewing specimens on a slide.

## Dissection stage

Make a slit in a rubber stopper with a razor blade. The slit should be about 1 cm deep.



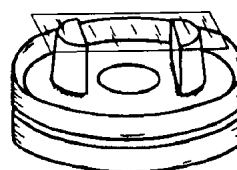
By pinching the stopper at both ends of the slit, make an opening to hold your specimen. Place the stopper and specimen in the center hole in the stage. Light your specimen from above.

## Transmission stage

Cut a rubber stopper into two halves.



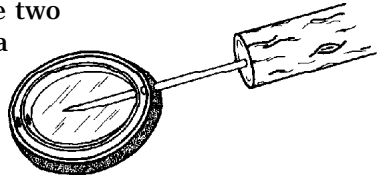
Put a velcro patch on each half, with the mate velcro pieces next to the center hole in the stage.



Attach the rubber stopper halves to the velcro. Place a slide across the stoppers. Light your specimen from below.

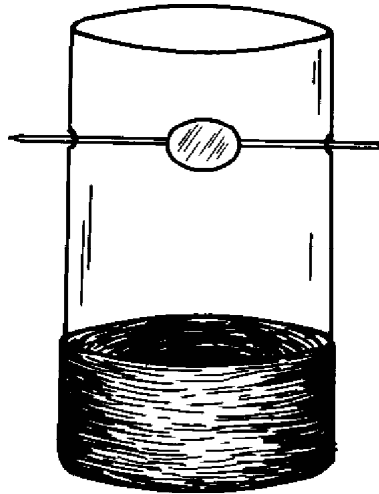
## Assemble the base

Use the nail to poke two holes in the rim of a film can lid, so that the holes are directly across from each other.



Poke the bamboo skewer through the holes. Cover the lid with aluminum foil.

Carefully thread the skewer through two hole poked in the cylinder of the bottle so the mirror is centered.

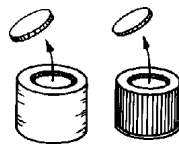


## Add the lens

Using a heated Pyrex test tube, melt a hole in the plastic bottle cap and in the bottom of the plastic film can.

With scissors, cut the film can to 1.5 cm in height.

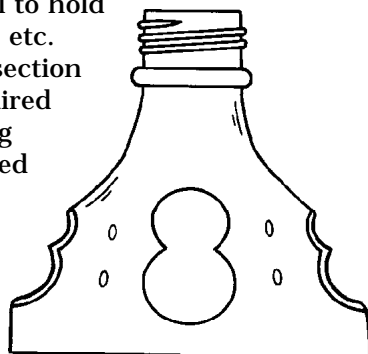
For lenses with a 24-29 mm diameter, mount between the bottle cap and the film can.



For lenses with a 22-24 mm diameter, mount directly between bottle lip and cap.



Melt small holes in the top part of the bottle with a heated nail to hold a beestick, etc. Melt 3 dissection ports of paired overlapping holes spaced about 120 degrees apart.



## The finished microscope

Adjust the focus of the lens to the plane of the specimen holder by trimming plastic from the cylinder.

