

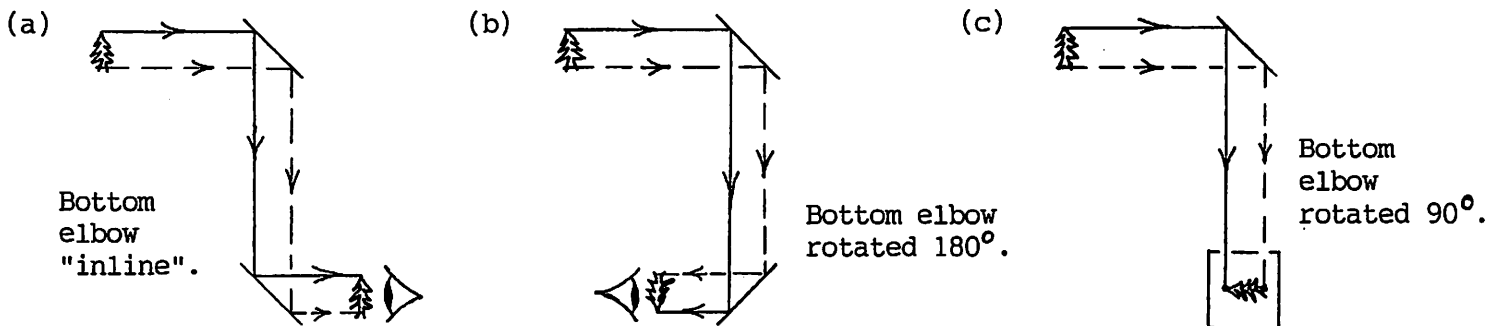
Light - reflection via the flat-mirrored periscope.

Modern plastic (PVC?) pipe enables us to assemble a simple periscope whose mirror(s) can be easily rotated or swiveled to view objects in several different ways. Thus, this versatile periscope provides students with an unusual and interesting study of the law of reflection using flat mirrors.

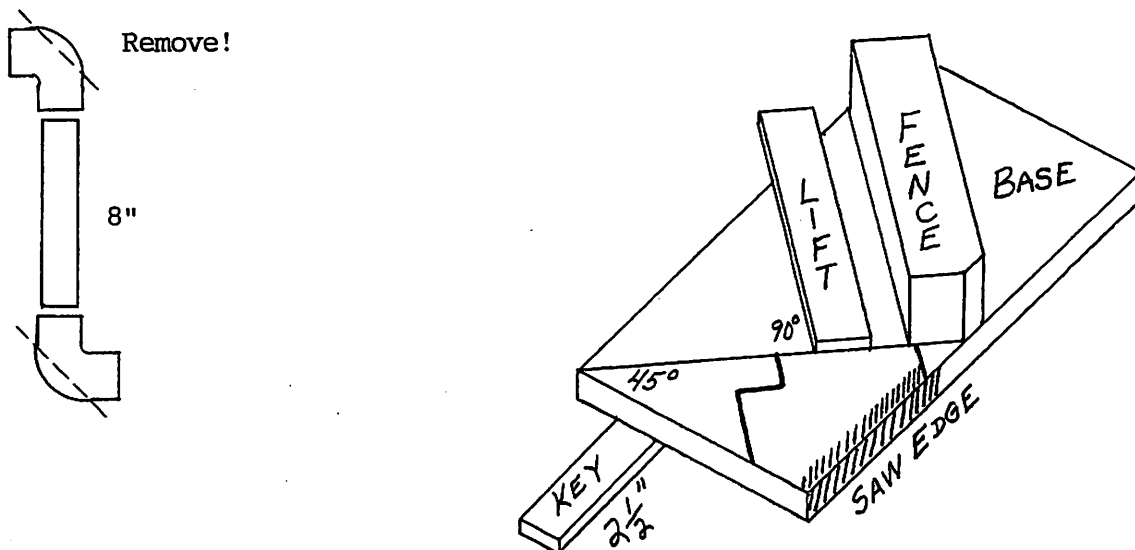
Pictured below are the three major positions or cases of the bottom mirror (elbow). So as not to confuse the students too much at first, rotate only the bottom elbow (mirror). Once these are understood, try other elbow positions, top and bottom, predicting the result (image position).

The materials needed are a straight piece of 1.5" I.D. pipe 8" long; two 1.5", 90°, pressure (not "waste pipe") elbows; two 2" x 3" flat mirrors cut from mirror tile; and duct tape. (1.5" pipe and elbows are cheaper and easier to find than 2"; the field of view is adequate.) Duct tape works well to tape the mirrors to the elbows and cover the sharp edges. The one tricky operation is to cut off the outside bend of the elbow at a 45° angle. I strongly recommend the use of a band saw and a special jig (See Diagram.) that would hold the elbow securely at the proper angle while it is being cut. This would provide both accuracy and safety during cutting. Once you have made a good jig, you can easily (and safely) turn out as many periscopes as you like. My jig fits a traditional Model 14 Delta Band Saw.

Diagram:



(d) (e) the jig: (See other side.)

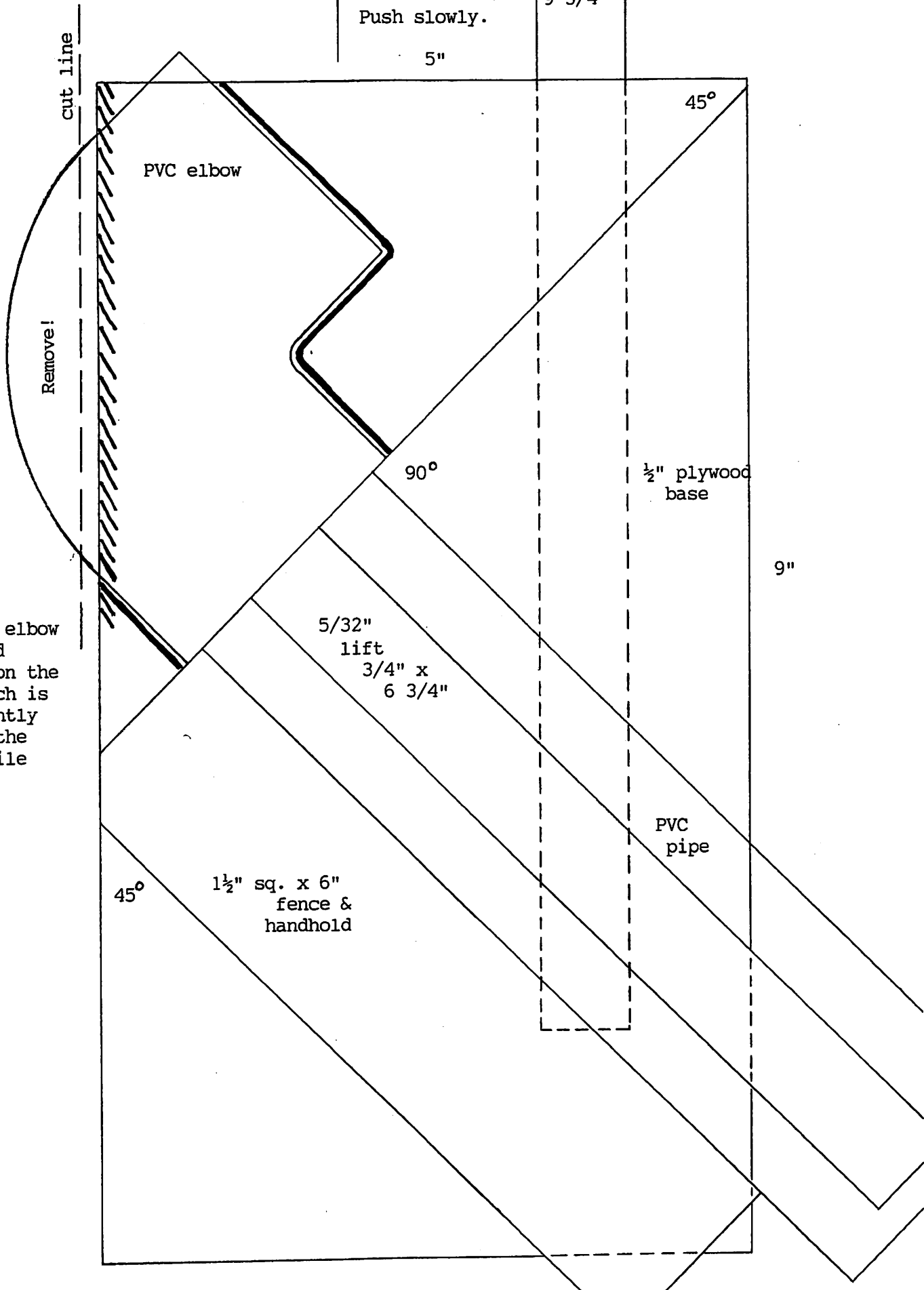


Scale: full

↑
Push slowly.
5"

key
9 3/4"

Other dimensions of the
key must be decided
from the saw's keyway.



cut line

Remove!

PVC elbow

45°

90°

1/2" plywood
base

9"

Note the elbow
is jammed
tightly on the
pipe which is
held tightly
against the
fence while
cutting.

5/32"
lift
3/4" x
6 3/4"

PVC
pipe

45°

1 1/2" sq. x 6"
fence &
handhold