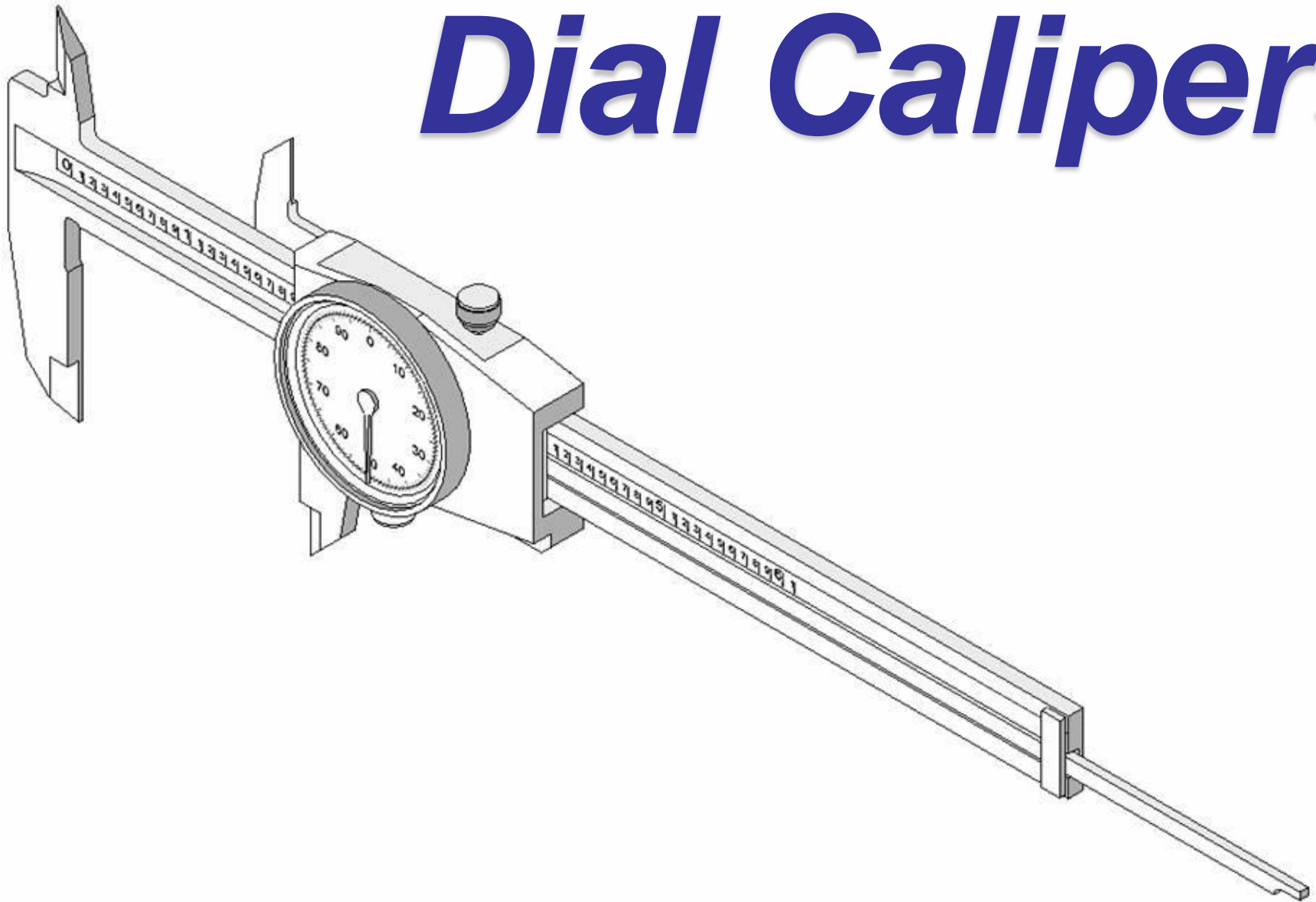


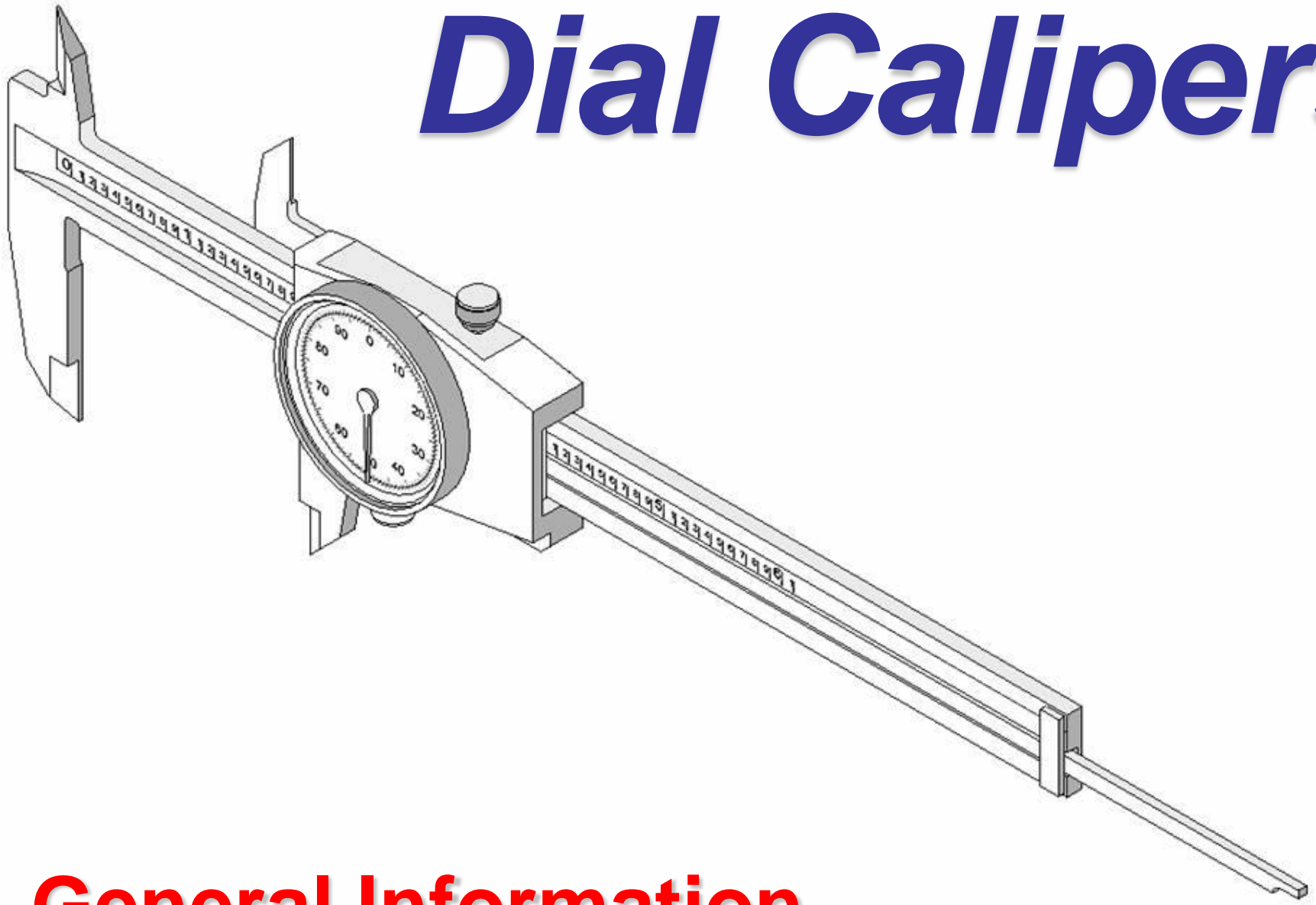


Forging new generations of engineers

Dial Calipers

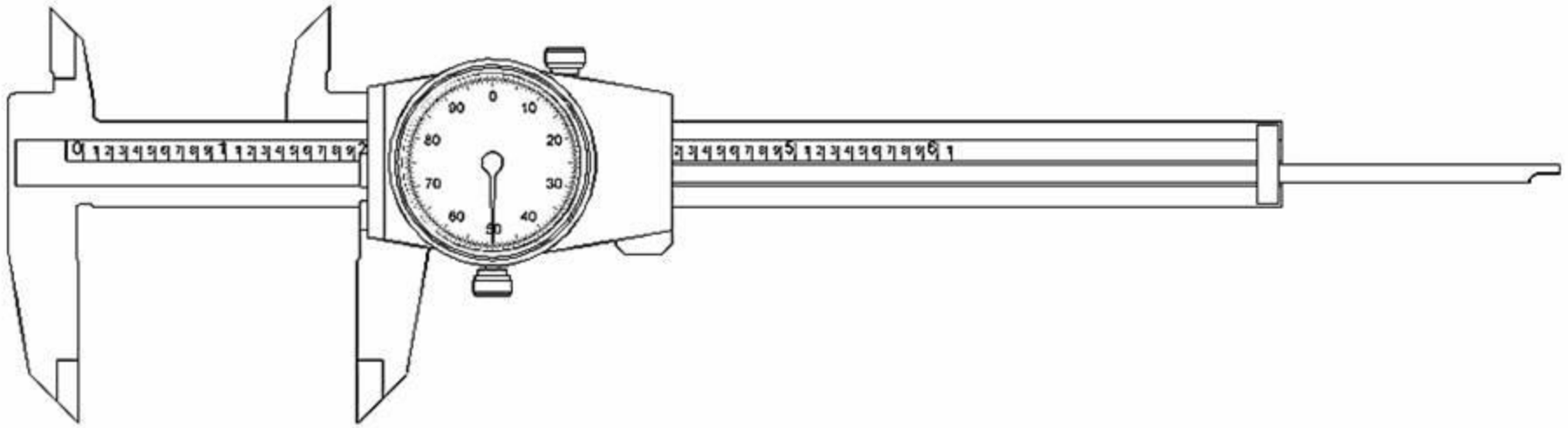


Dial Calipers



General Information

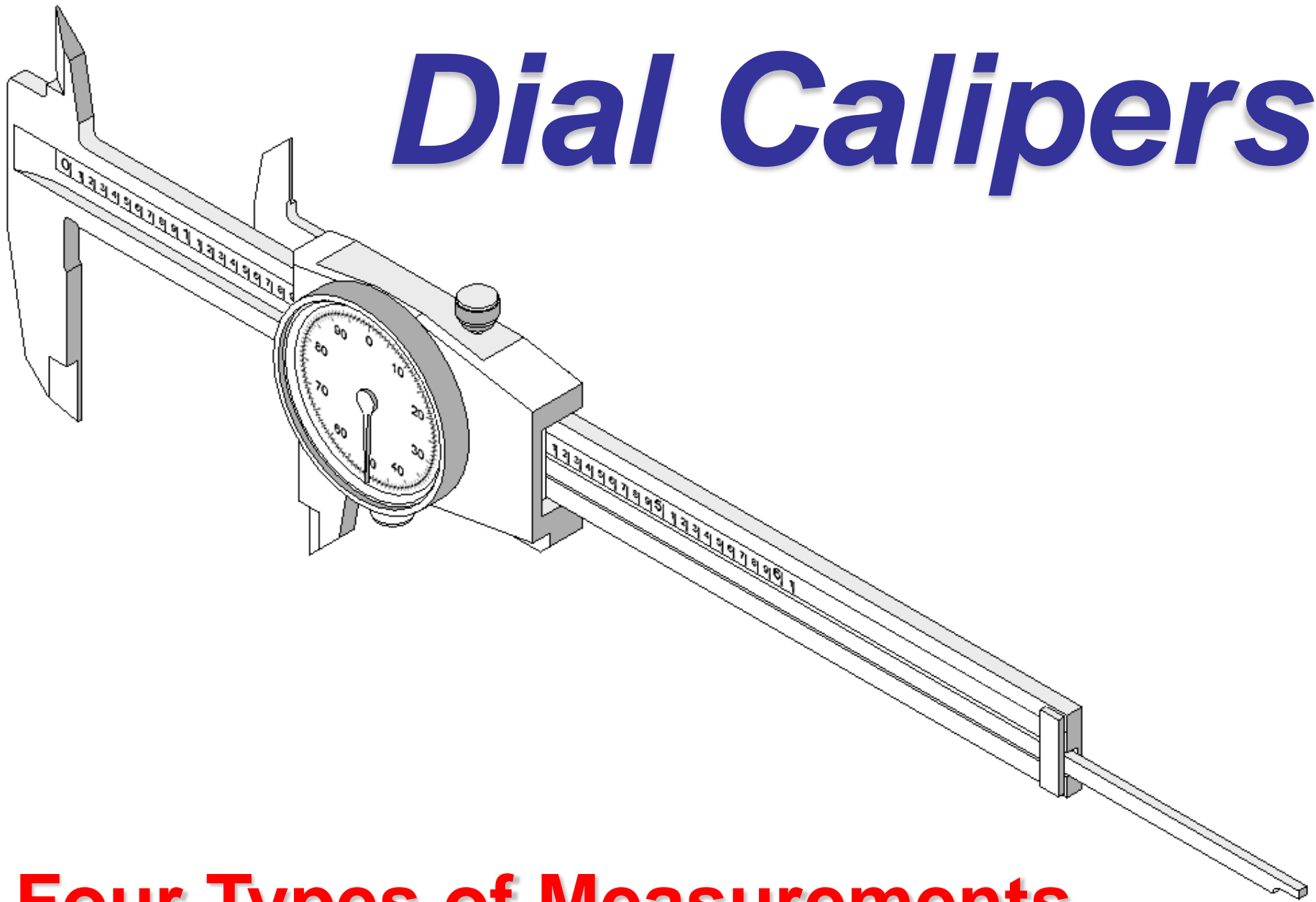




Dial Calipers are arguably the most common and versatile of all the precision measuring tools used by engineers and manufacturers.

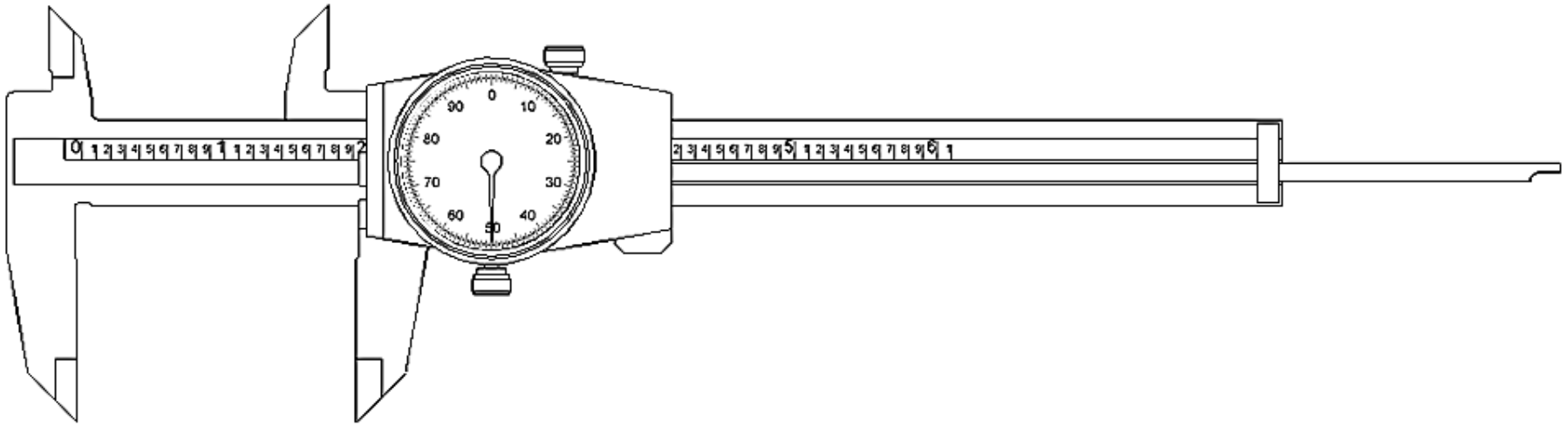


Dial Calipers



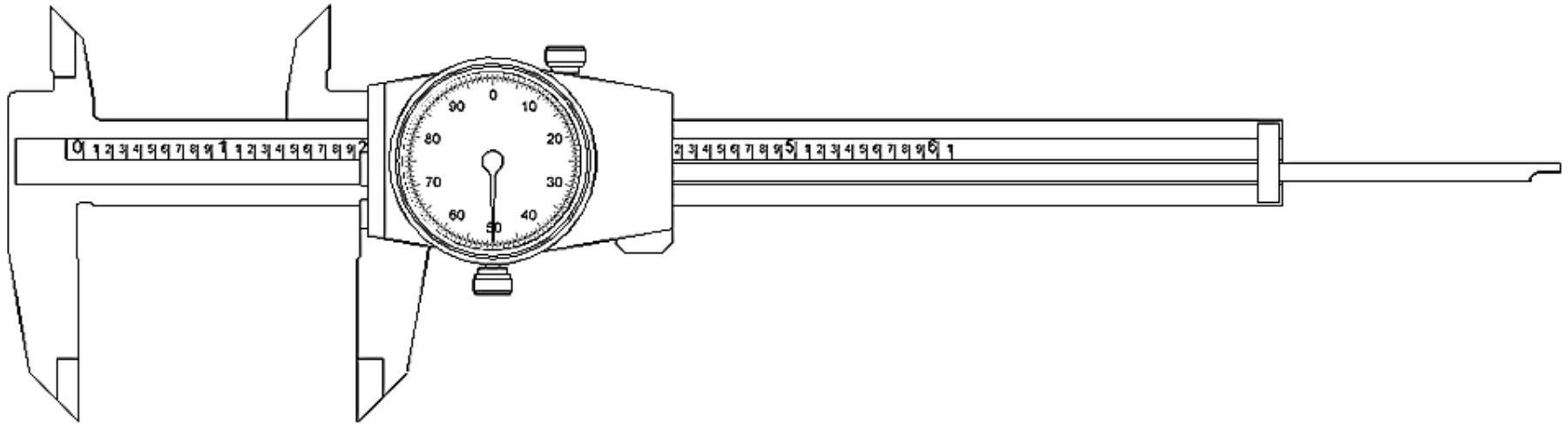
Four Types of Measurements





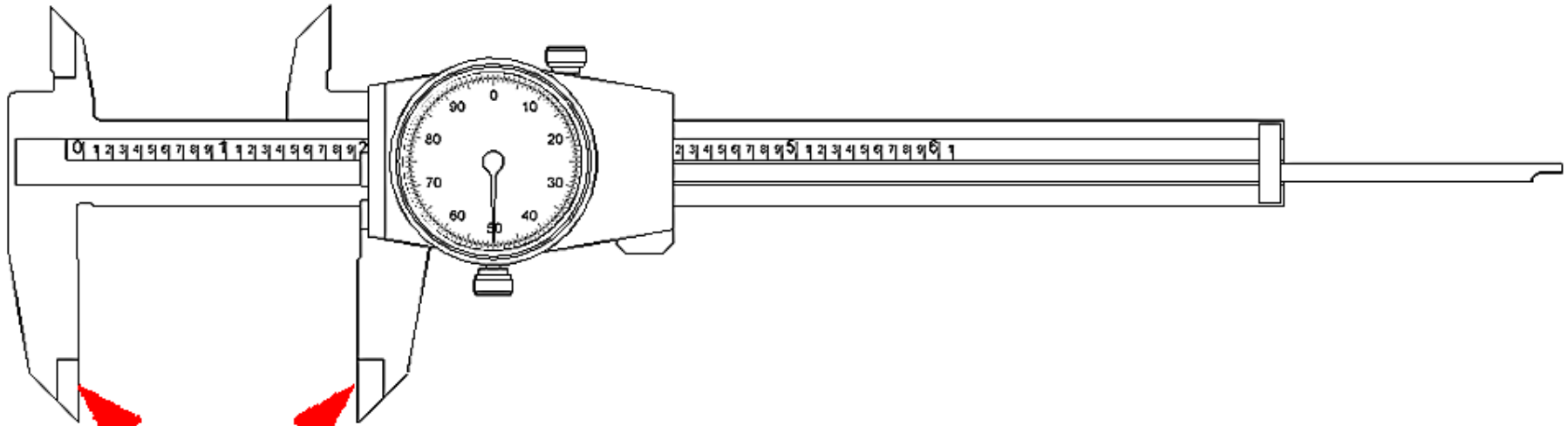
Dial calipers are used to perform four common measurements on parts...





1. Outside Diameter or Object Thickness
2. Inside Diameter or Space Width
3. Step Distance
4. Hole Depth

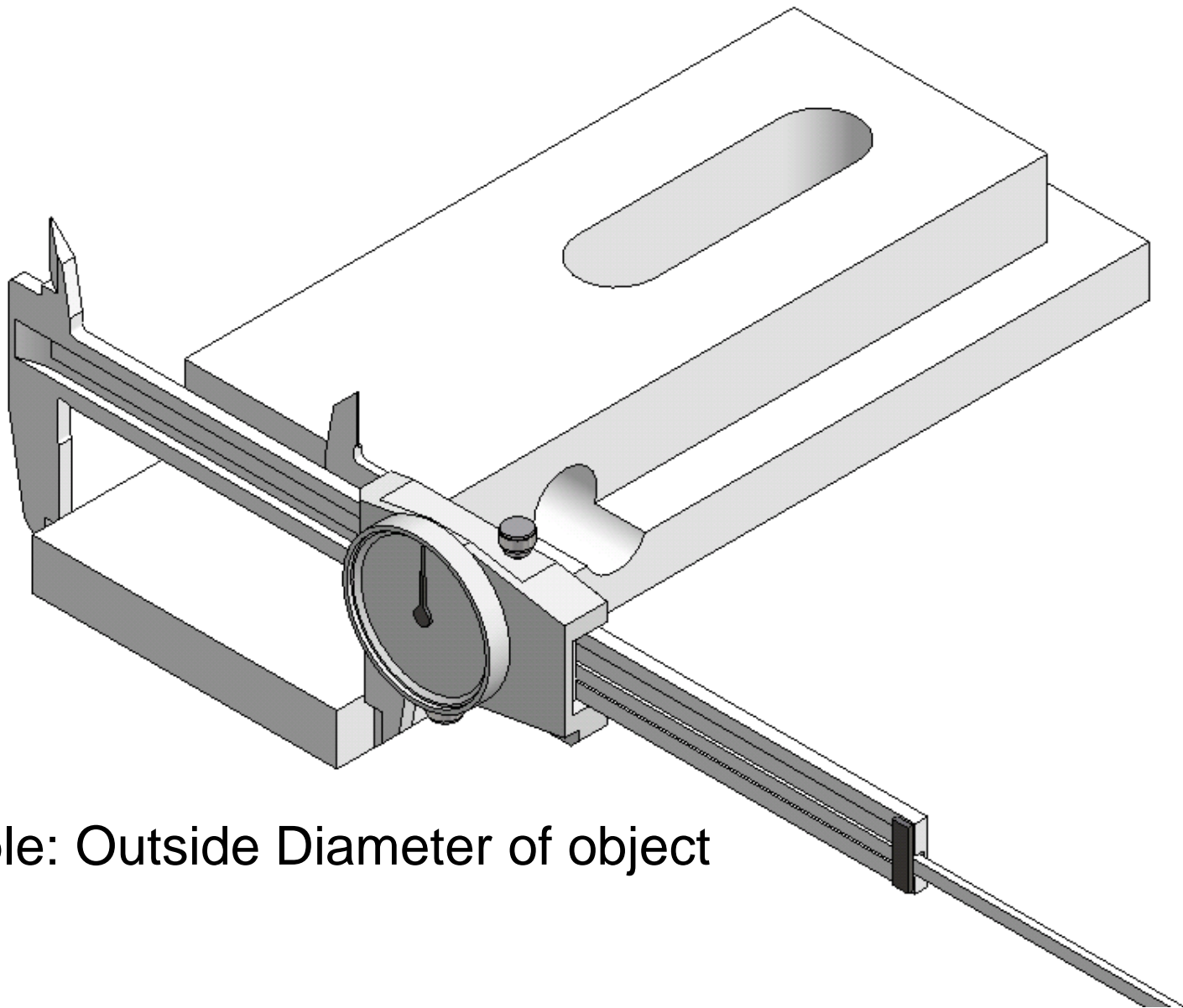




Outside Measuring Faces

These are the faces between which outside length or diameter is measured.

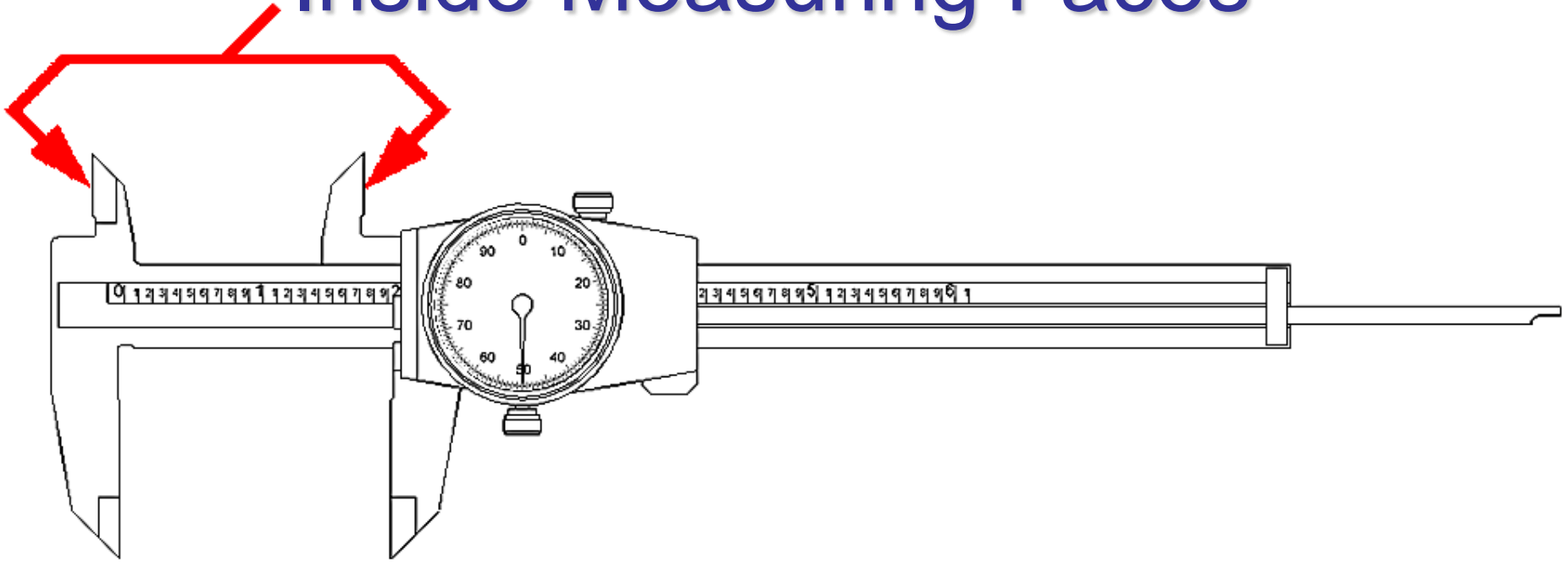




Example: Outside Diameter of object



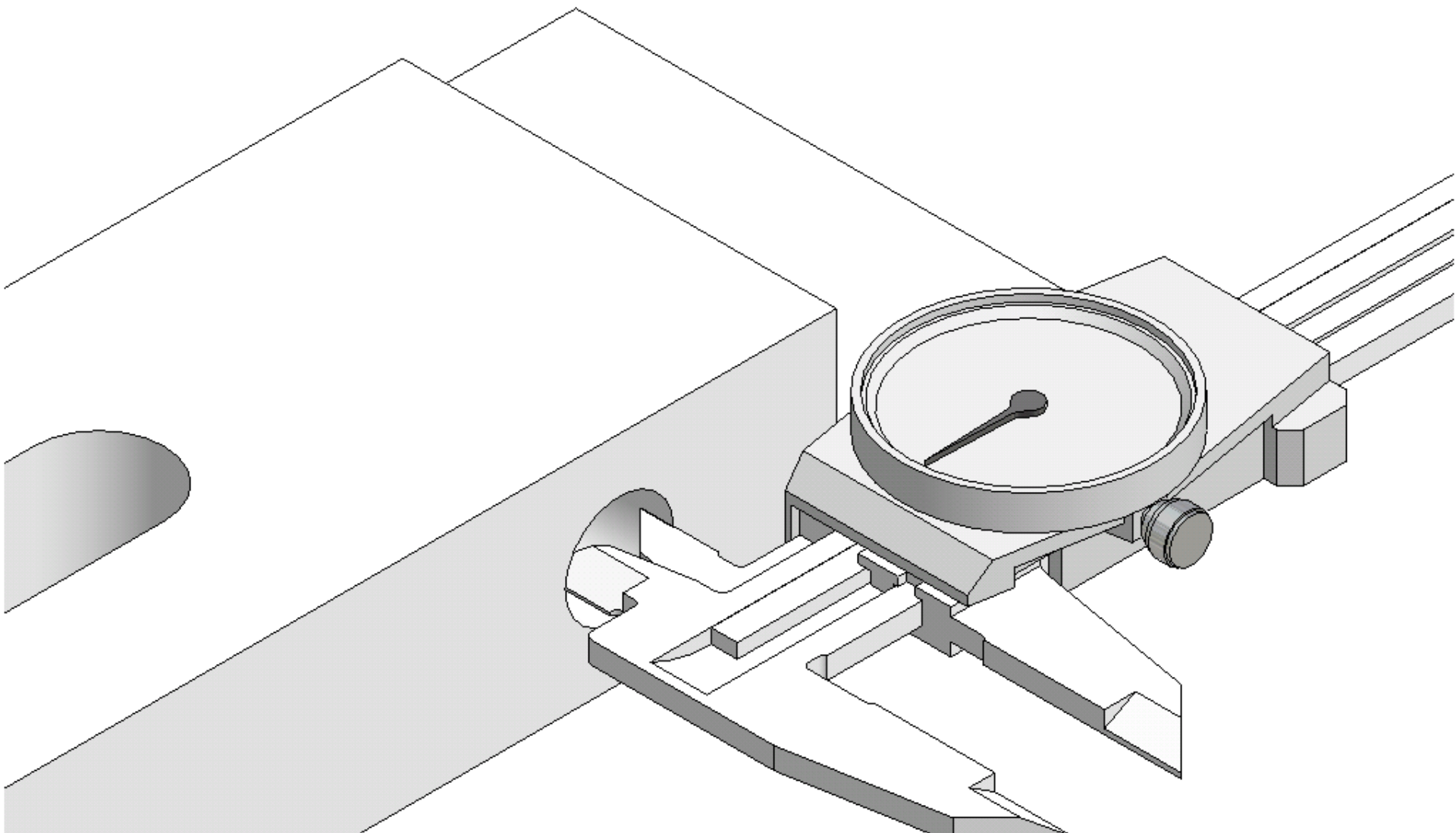
Inside Measuring Faces



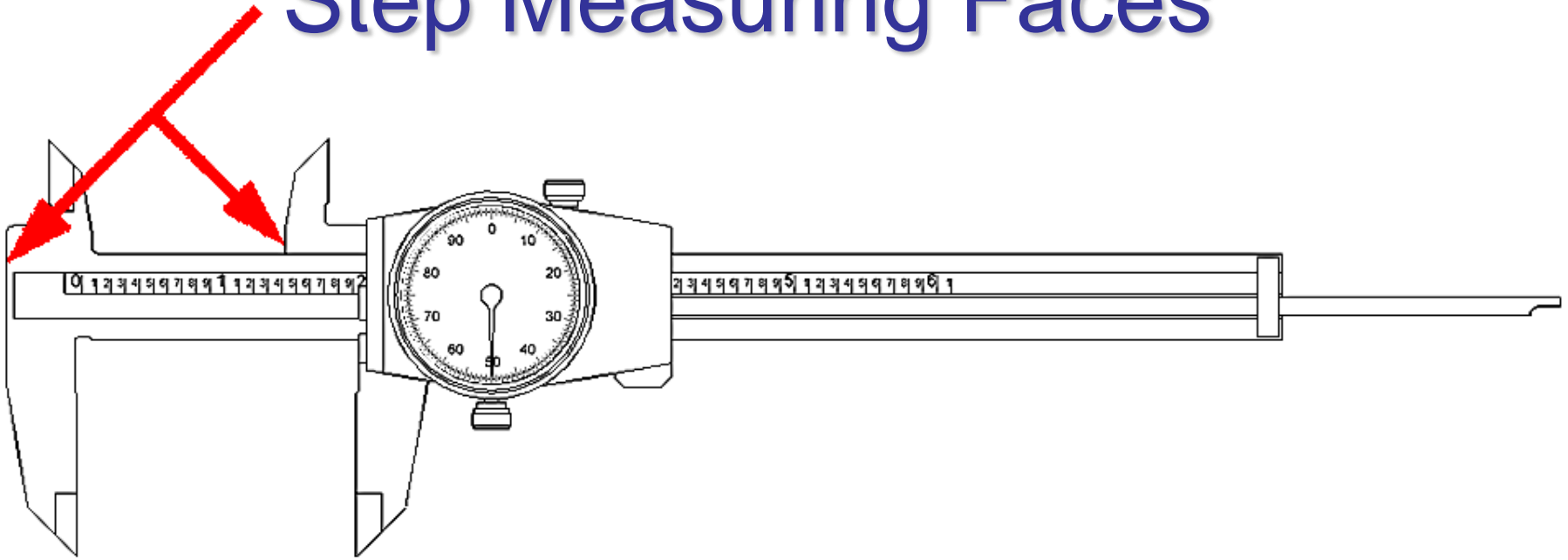
These are the faces between which inside diameter or space width (i.e., slot width) is measured.



Example: Inside measuring

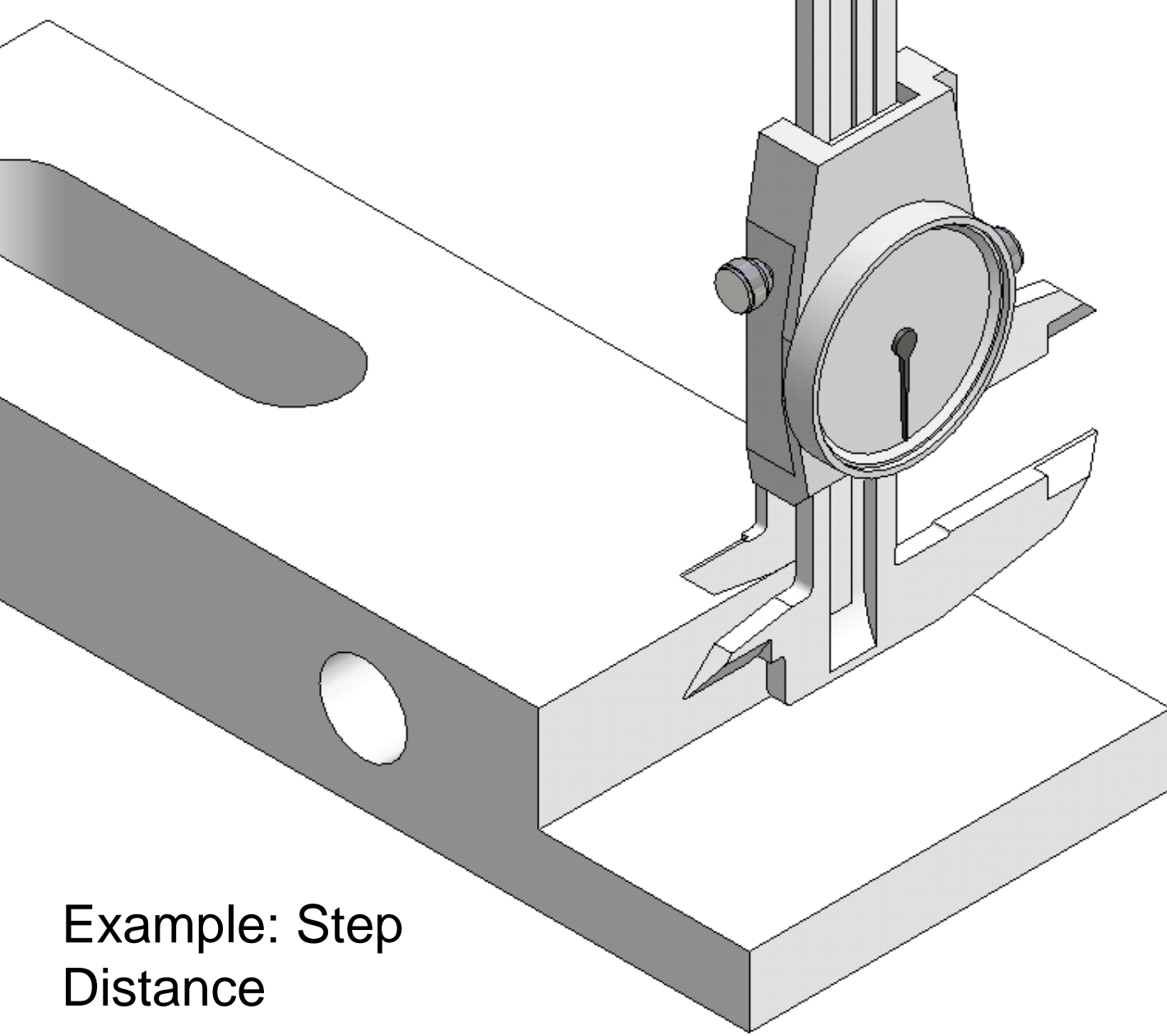


Step Measuring Faces



These are the faces between which stepped parallel surface distance can be measured.

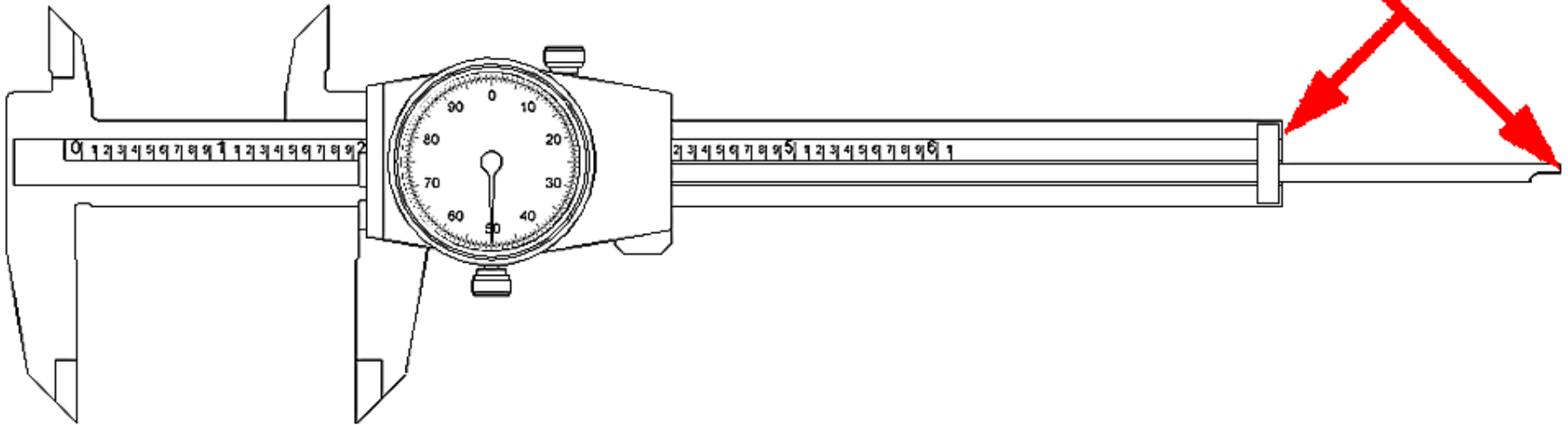




Example: Step
Distance

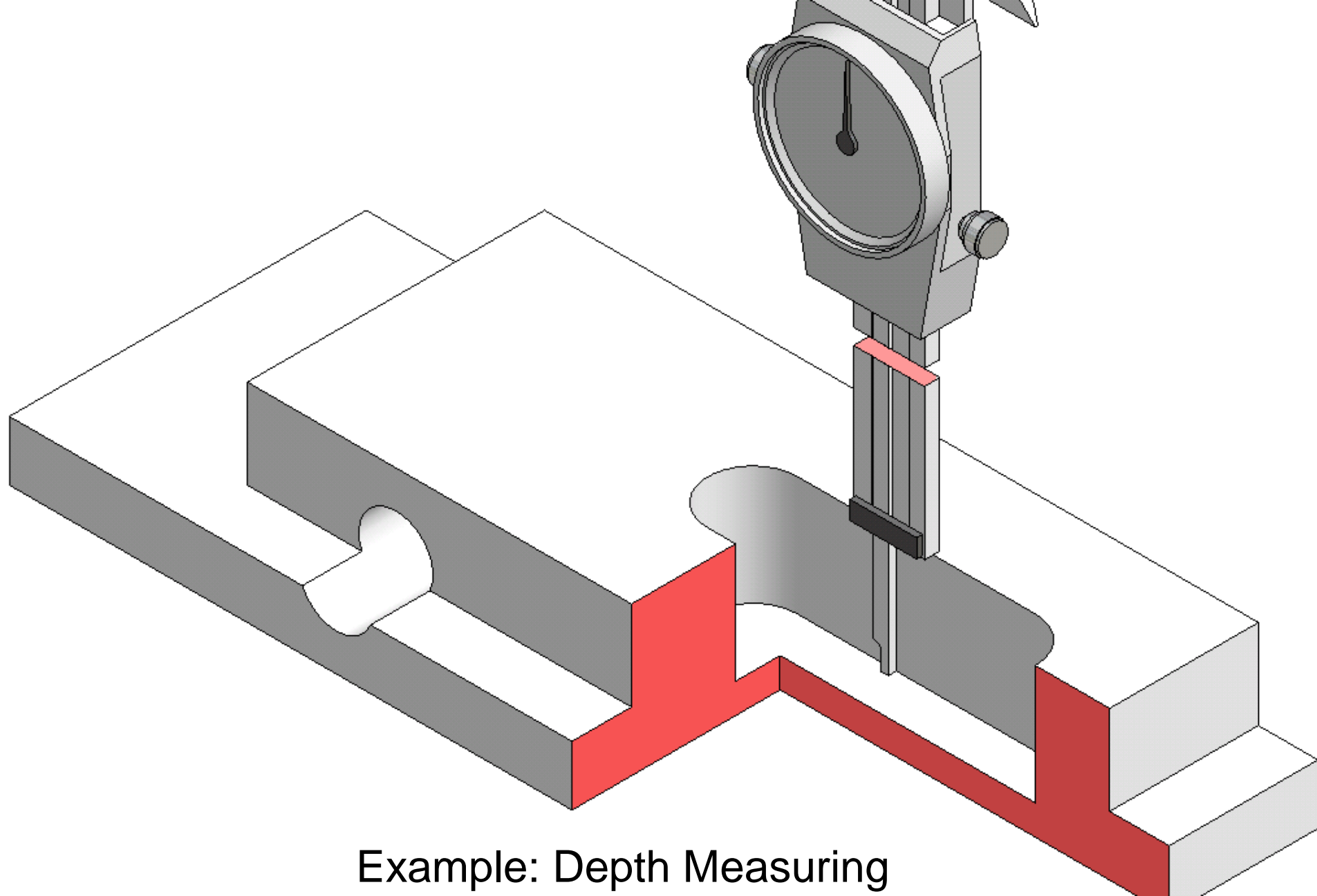


Depth Measuring Faces



These are the faces between which the depth of a hole can be measured.



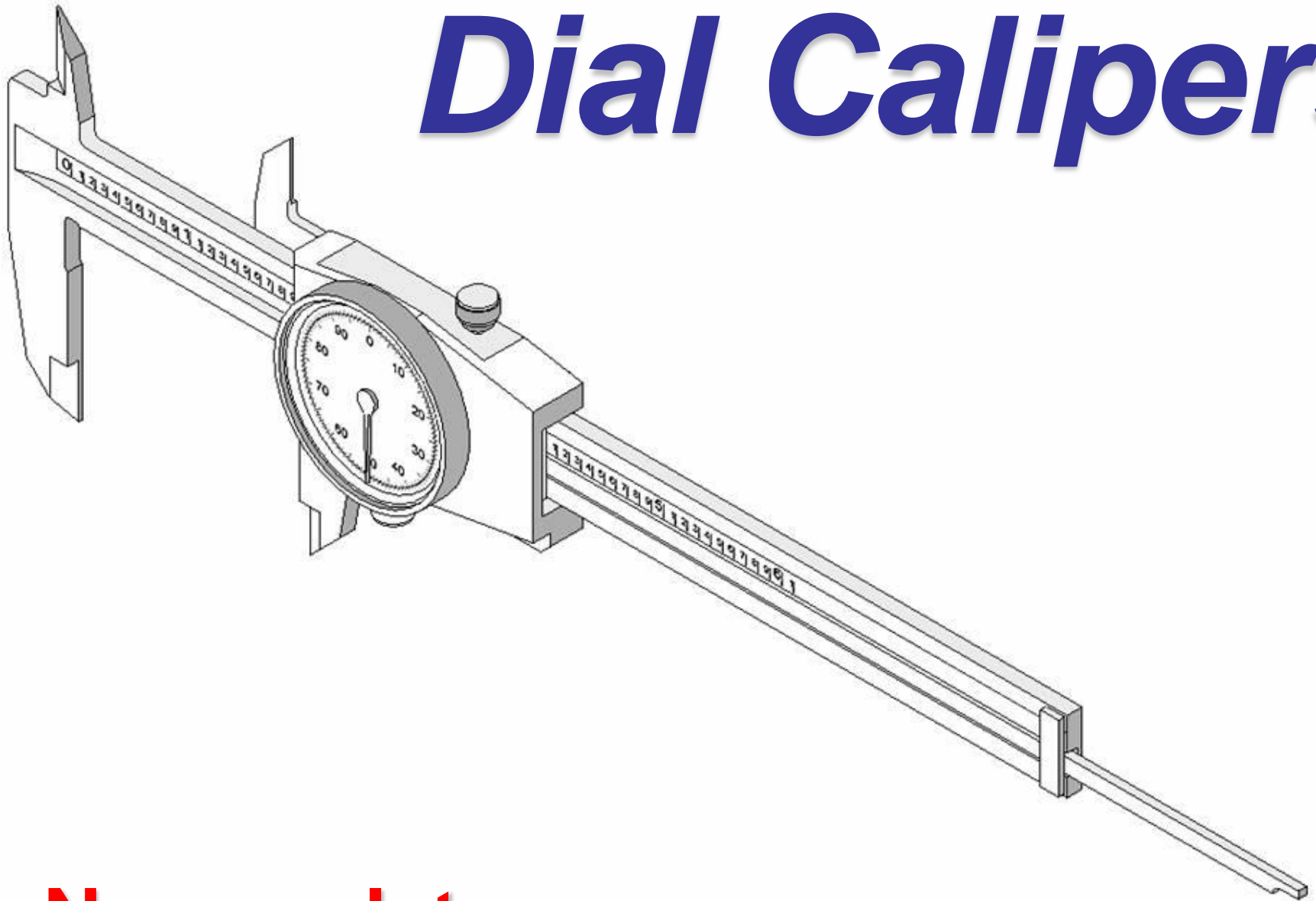


Example: Depth Measuring

Note: Work piece is shown in section. Dial Caliper shortened for graphic purposes.

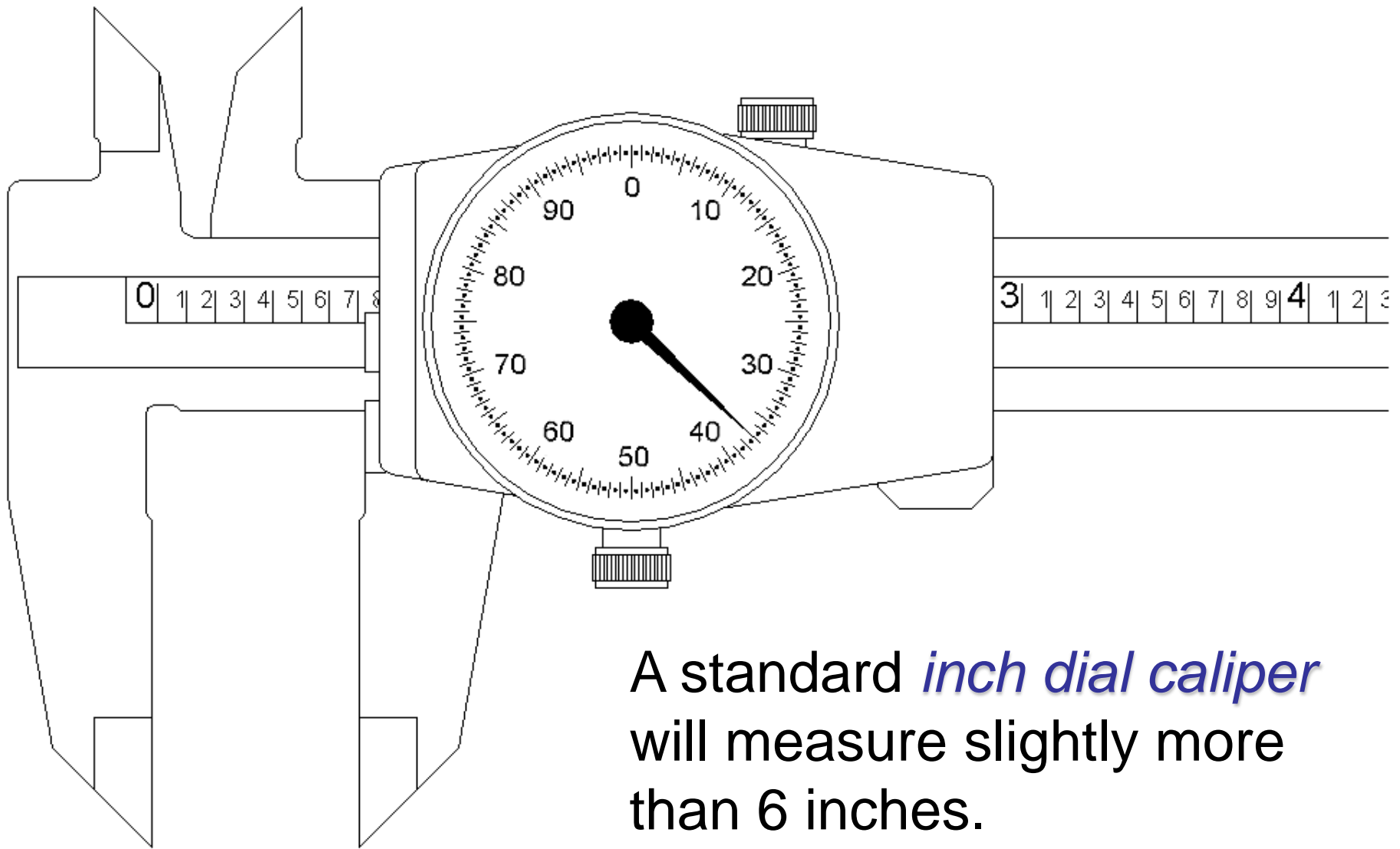


Dial Calipers



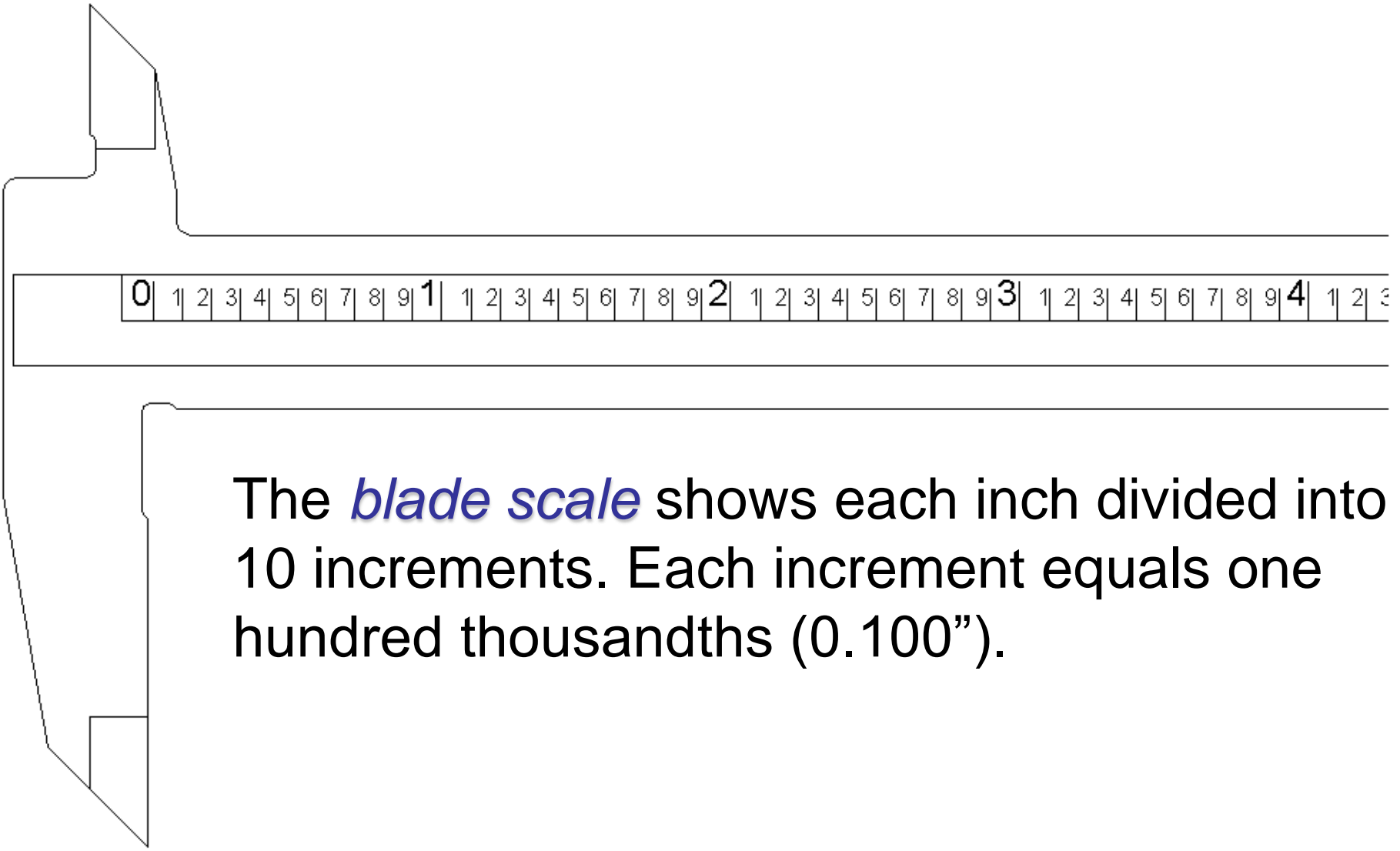
Nomenclature





A standard *inch dial caliper* will measure slightly more than 6 inches.





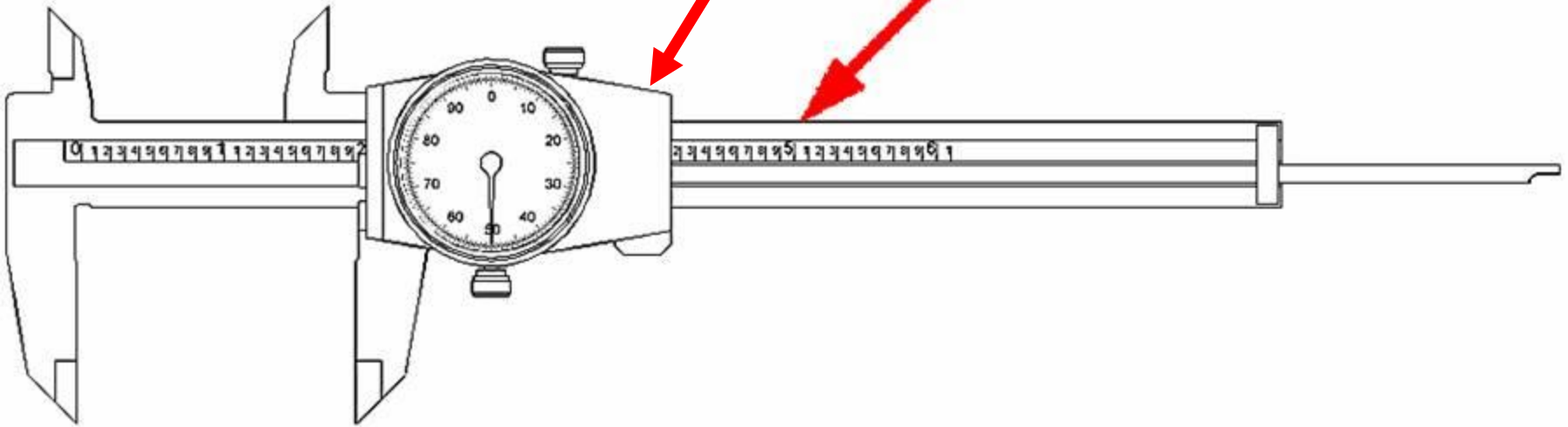
The diagram shows a horizontal blade scale with a vertical beam on the left. The scale is marked with major numbers 0, 1, 2, 3, and 4. Each major number is followed by a series of 10 smaller increments, representing 10 divisions per inch. The increments are labeled 1 through 9 for each major number. The scale is shown in a perspective view, with the beam and the scale itself.

0	1	2	3	4	5	6	7	8	9	1	1	2	3	4	5	6	7	8	9	2	1	2	3	4	5	6	7	8	9	3	1	2	3	4	5	6	7	8	9	4	1	2	3
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

The *blade scale* shows each inch divided into 10 increments. Each increment equals one hundred thousandths (0.100”).



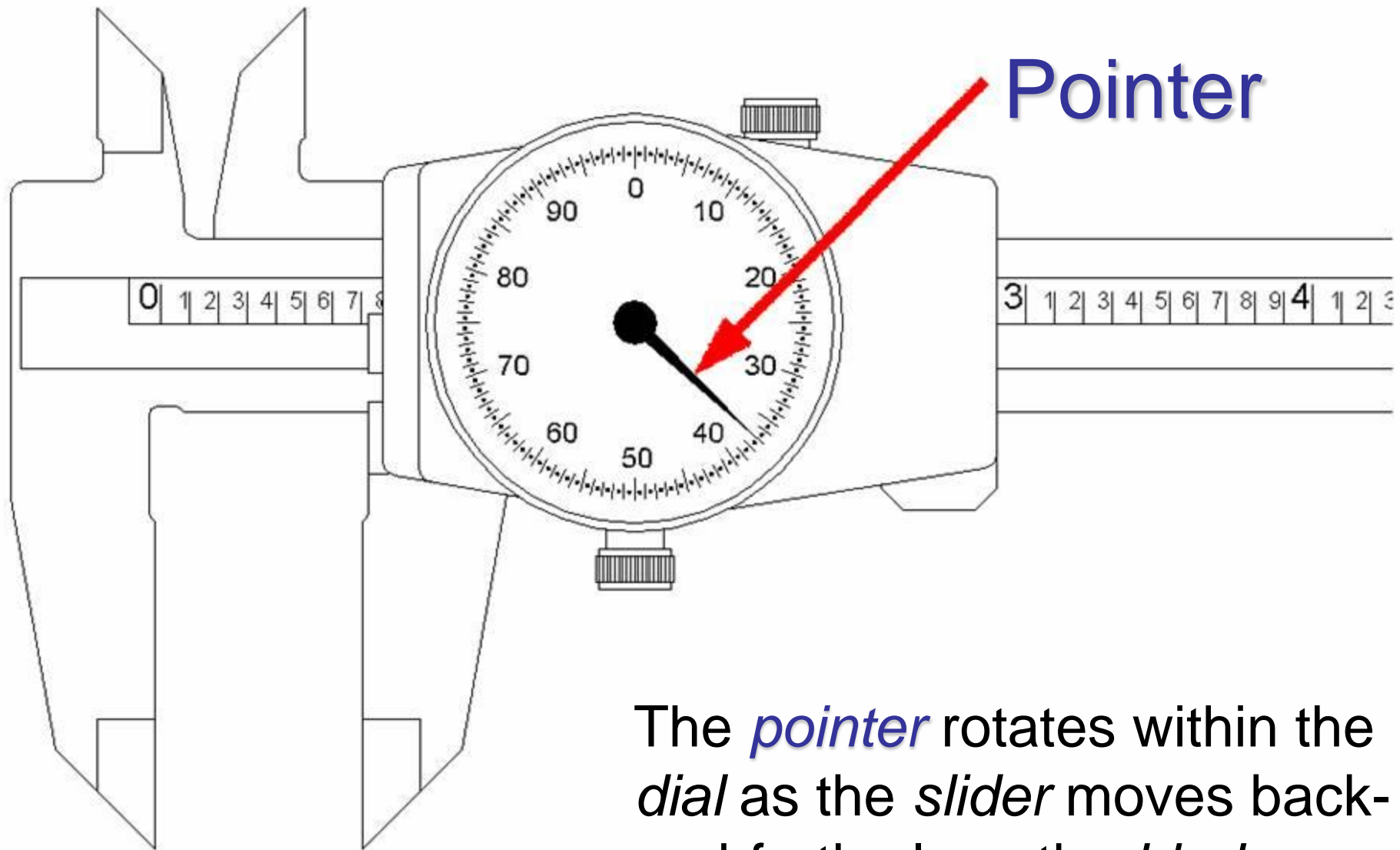
Slider Blade



The *blade* is the immovable portion of the dial caliper.

The *slider* moves along the *blade* and is used to adjust the distance between the measuring surfaces.

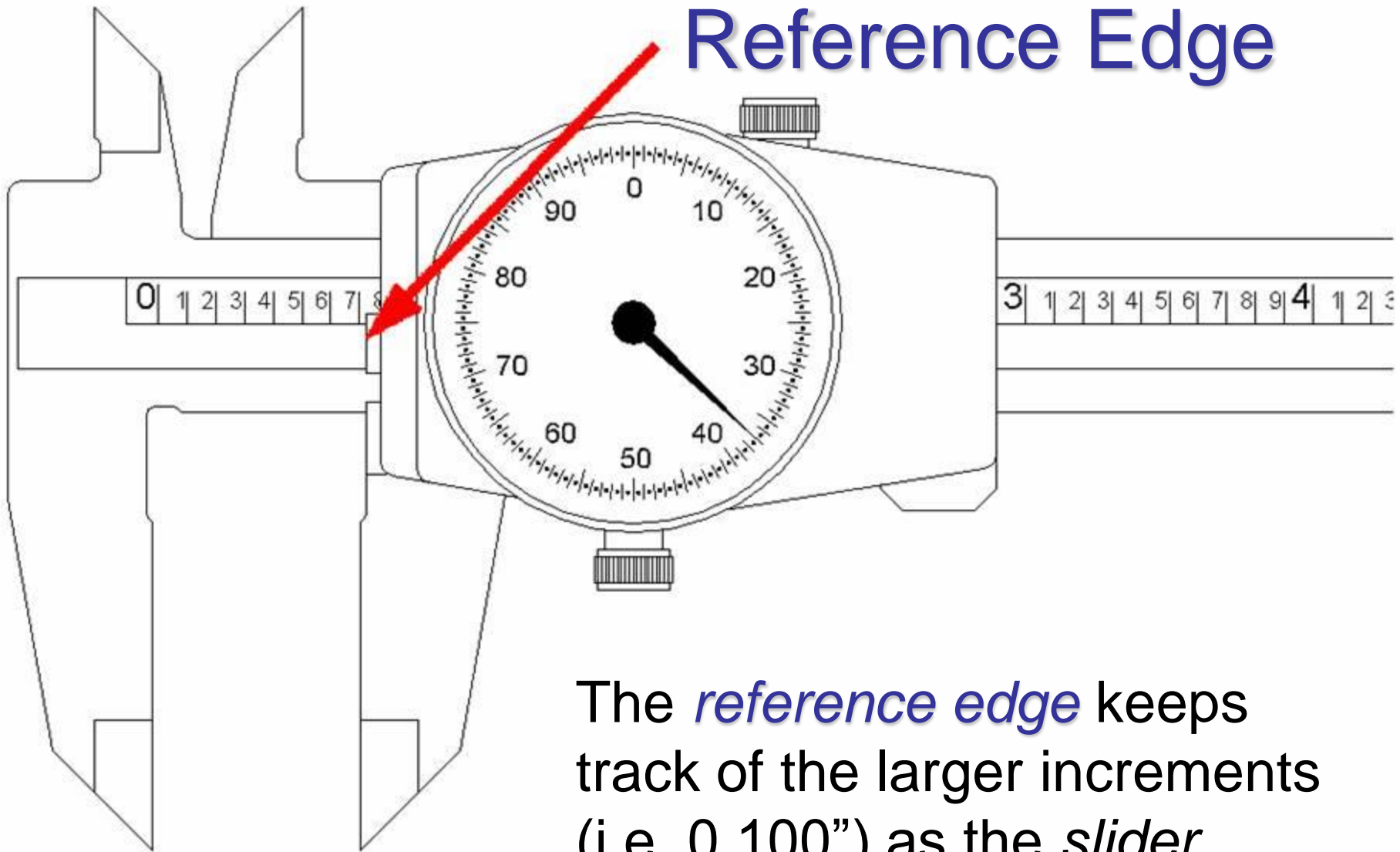




The *pointer* rotates within the *dial* as the *slider* moves back-and-forth along the *blade*.

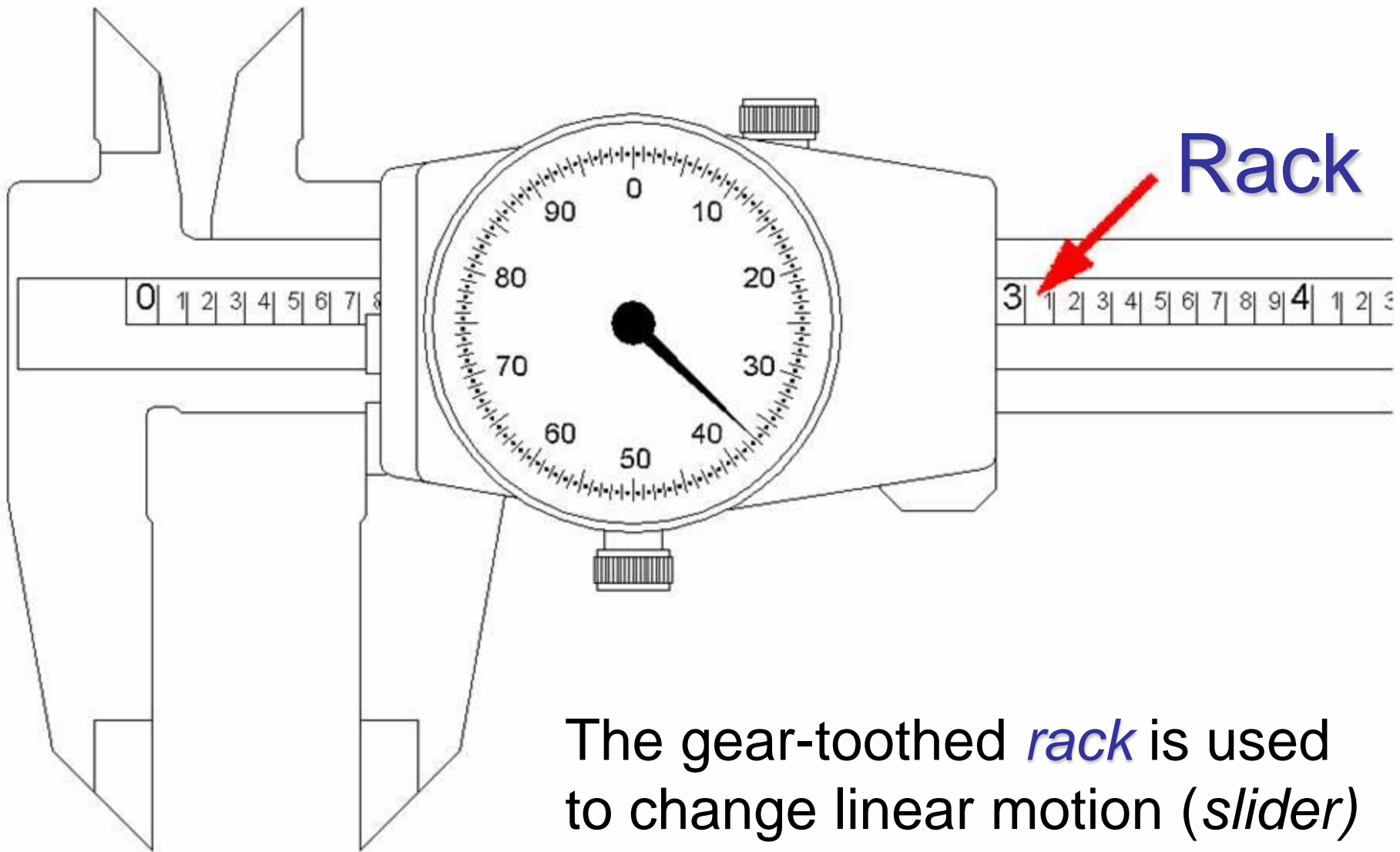


Reference Edge



The *reference edge* keeps track of the larger increments (i.e. 0.100") as the *slider* moves along the *rack*.

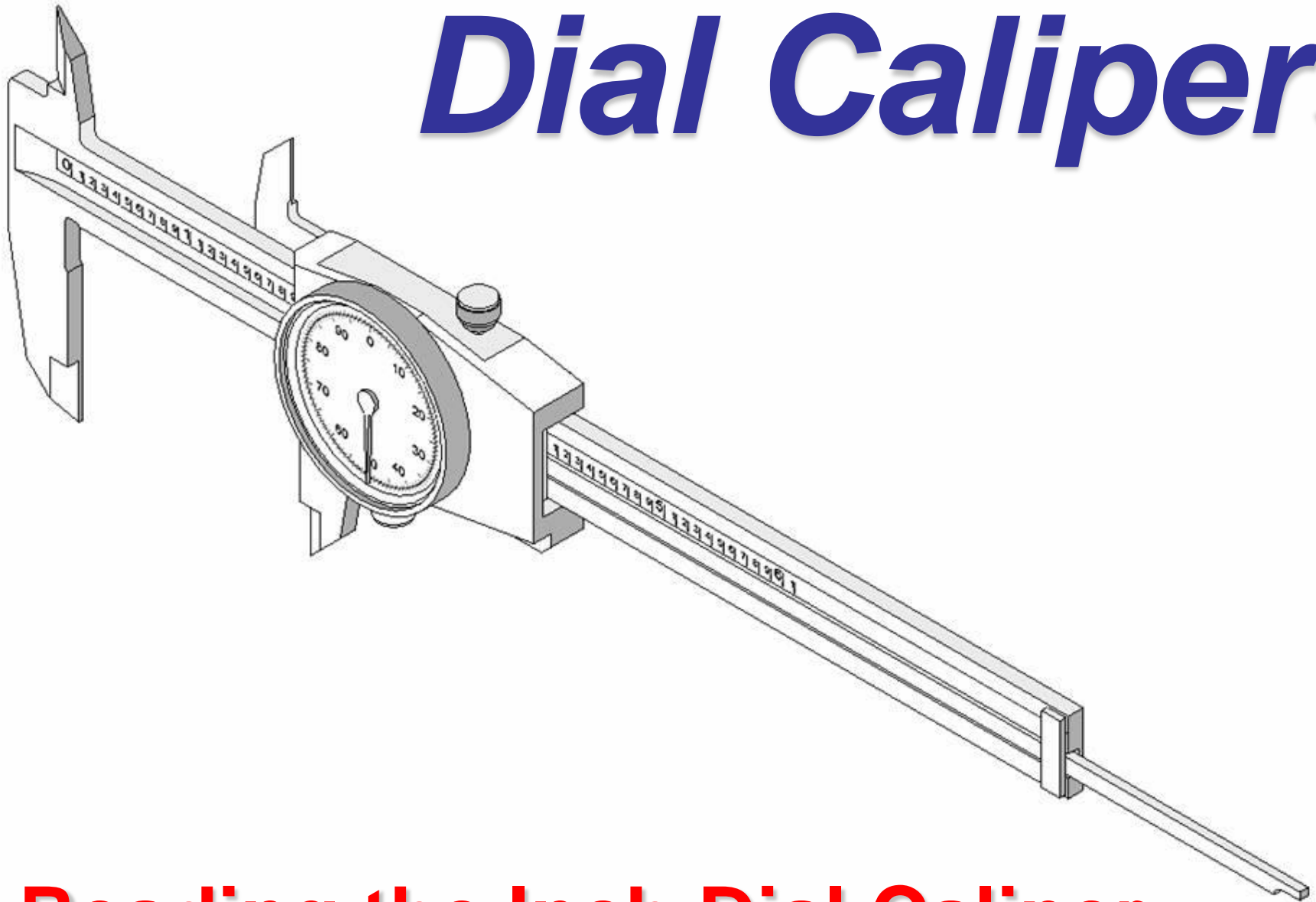




The gear-toothed *rack* is used to change linear motion (*slider*) to rotary motion (*pointer*).

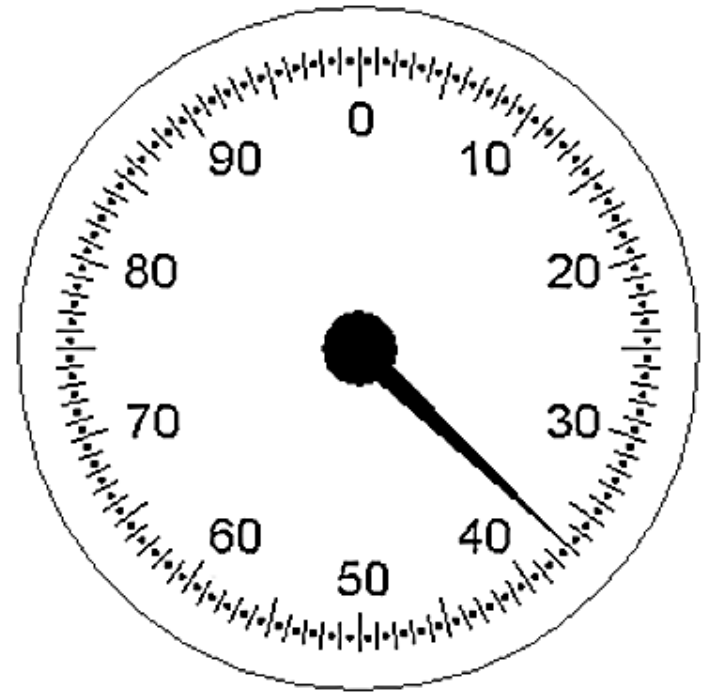
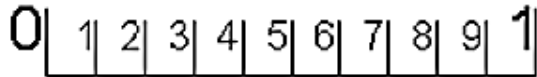


Dial Calipers



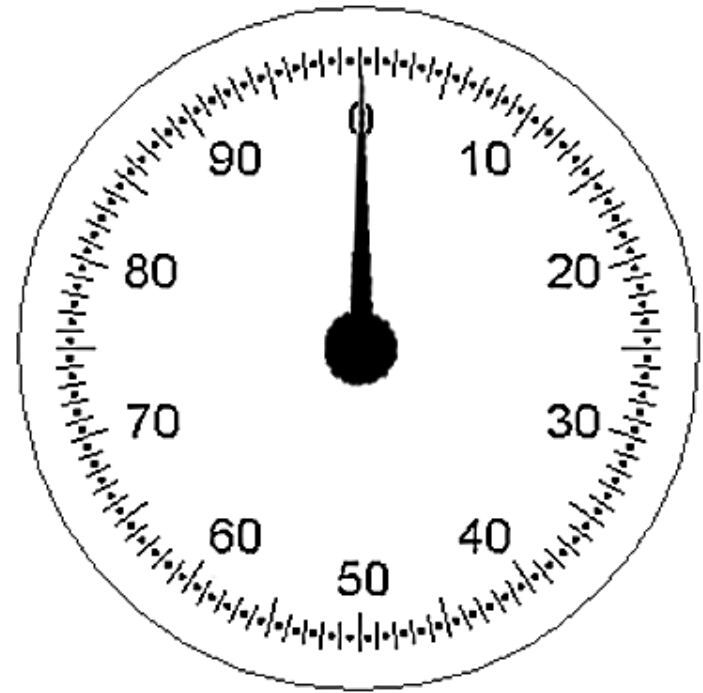
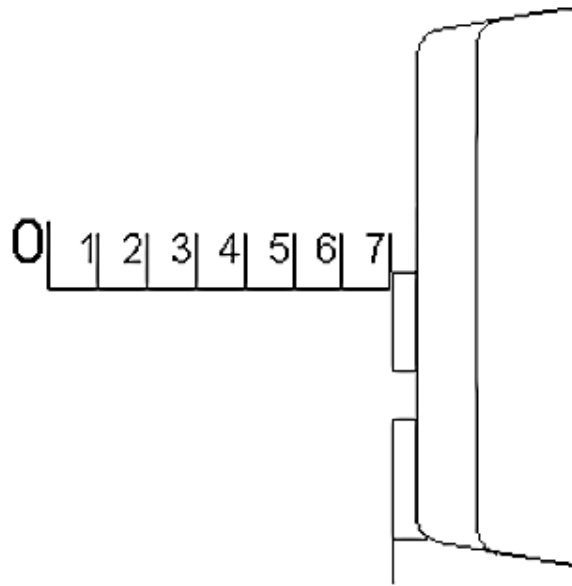
Reading the Inch Dial Caliper





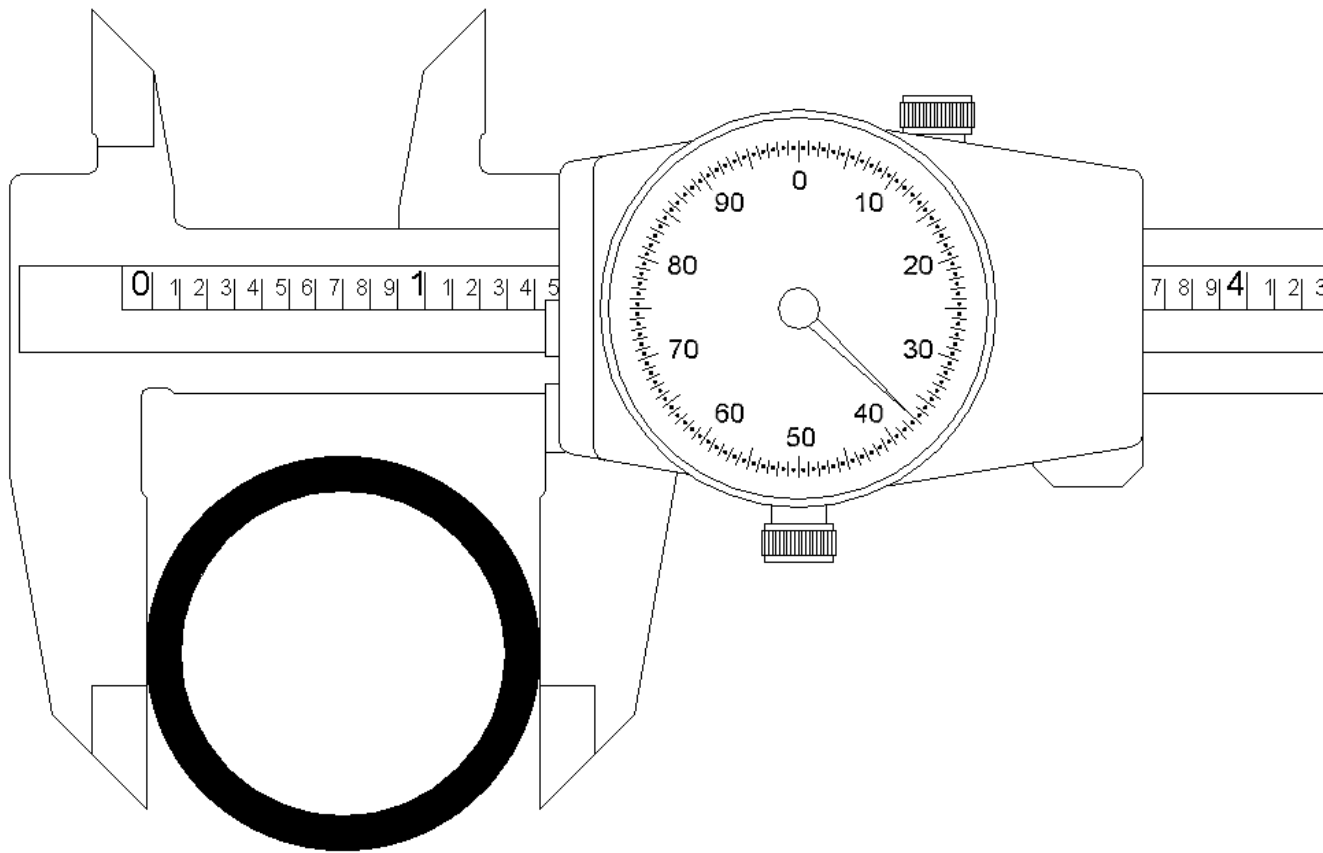
The *dial* is divided 100 times, with each graduation equaling one thousandth of an inch (0.001").





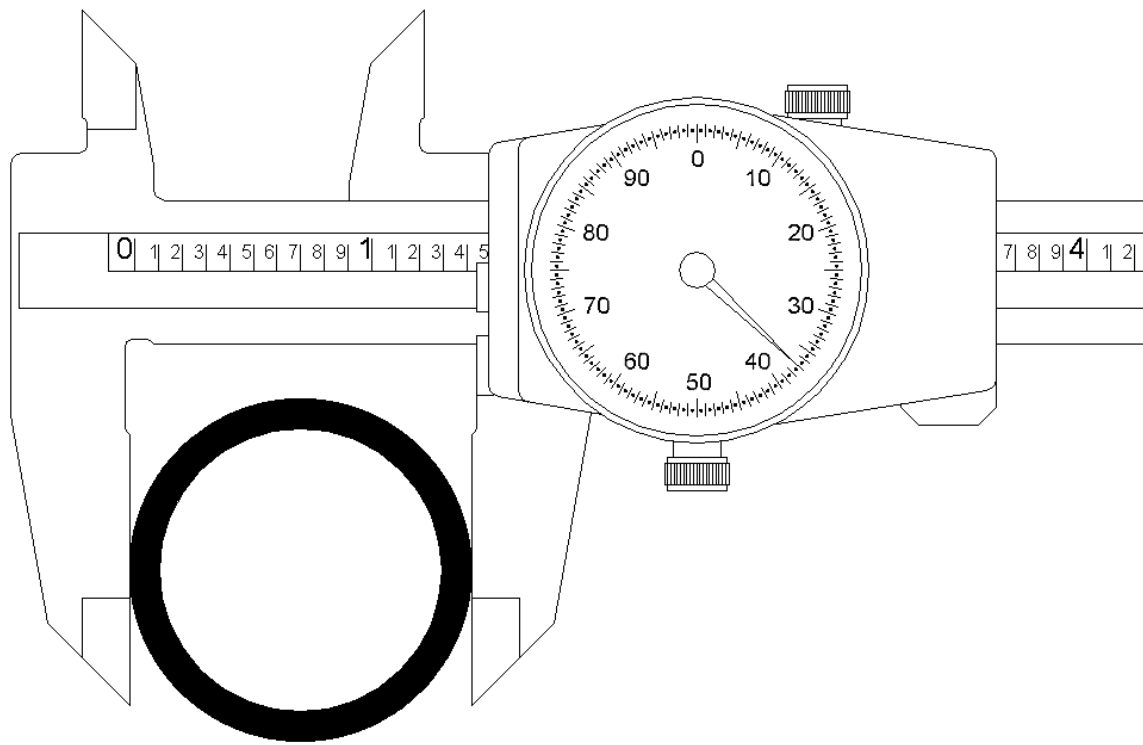
Every time the *pointer* completes one rotation, the *reference edge* on the *slider* will have moved the distance of one *blade scale* increment (0.100").





To determine the outside diameter of this pipe section, the user must first identify how many inches are being shown on the *blade scale*.



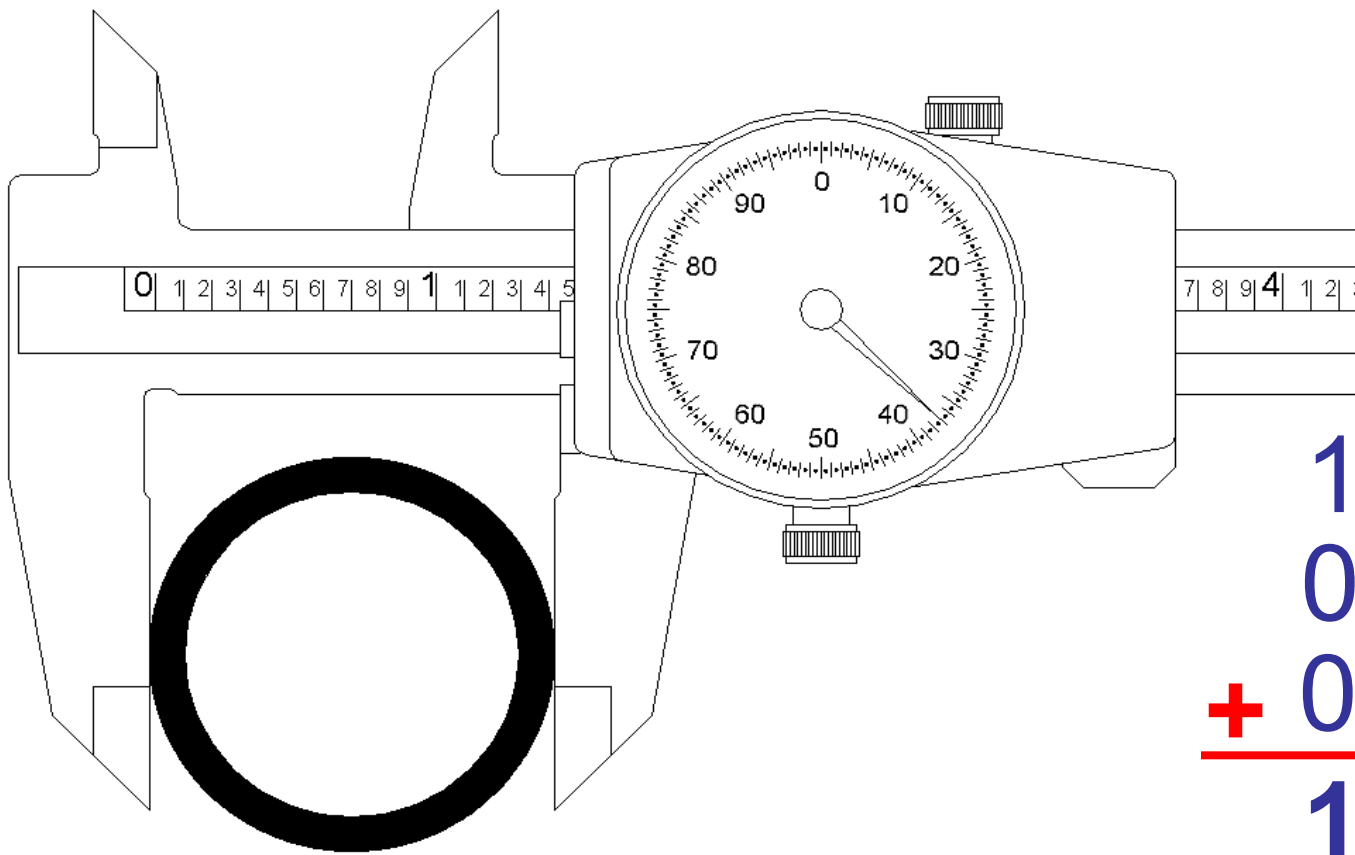


1.000"
0.400"

The *reference edge* is located between the 1 and 2 inch marks.
So, the user makes a mental note...1 inch.

The user then identifies how many 0.1" increment marks are
showing to the right of the last inch mark.
In this case, there are 4...or 0.400".





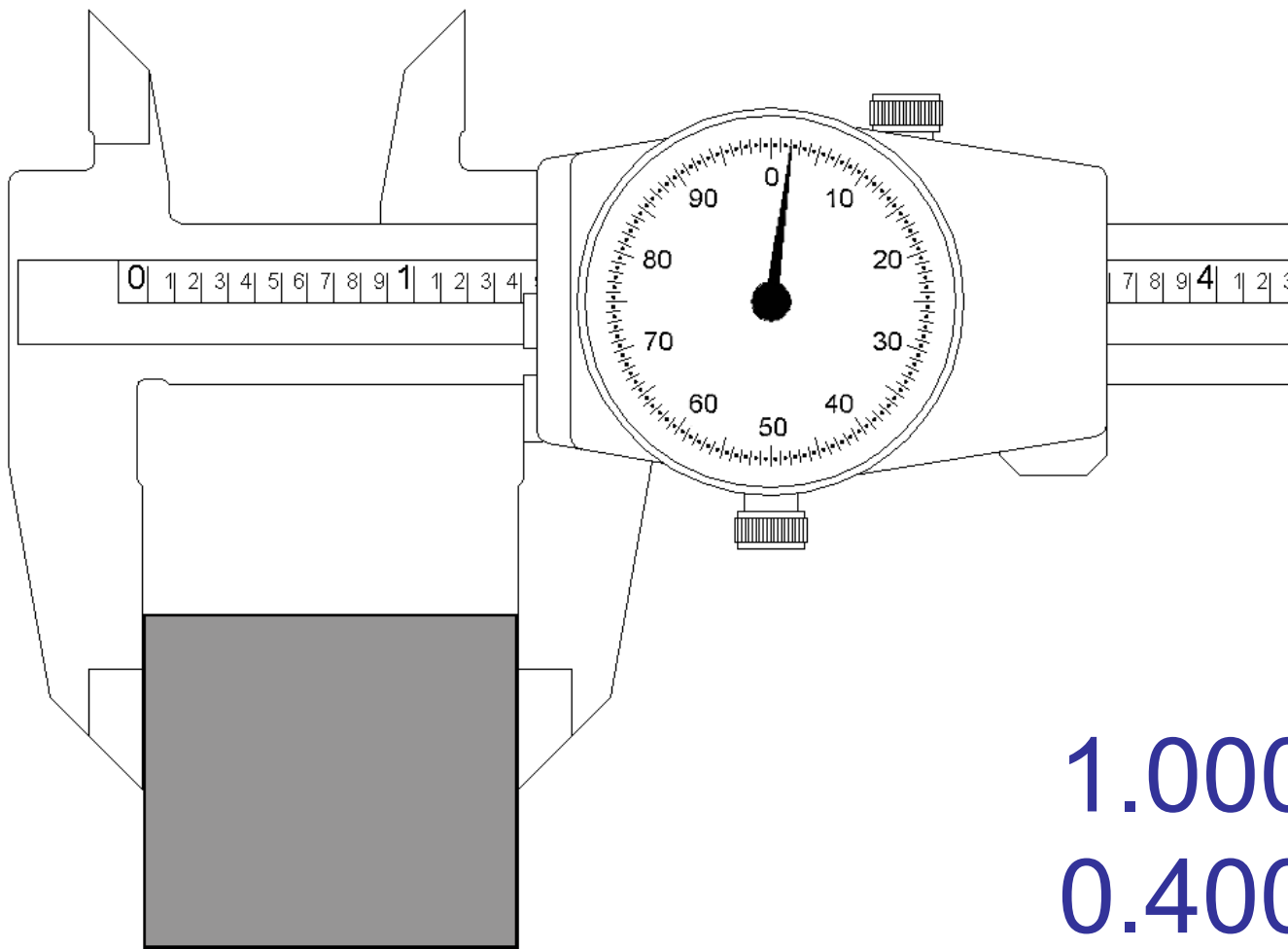
$$\begin{array}{r} 1.000'' \\ 0.400'' \\ + 0.037'' \\ \hline 1.437'' \end{array}$$

Next, the user looks at the *pointer* on the *dial* to see how many thousandths it is pointing to.

In this case, it is pointing to 37...or 0.037".

The user then adds the three values together...



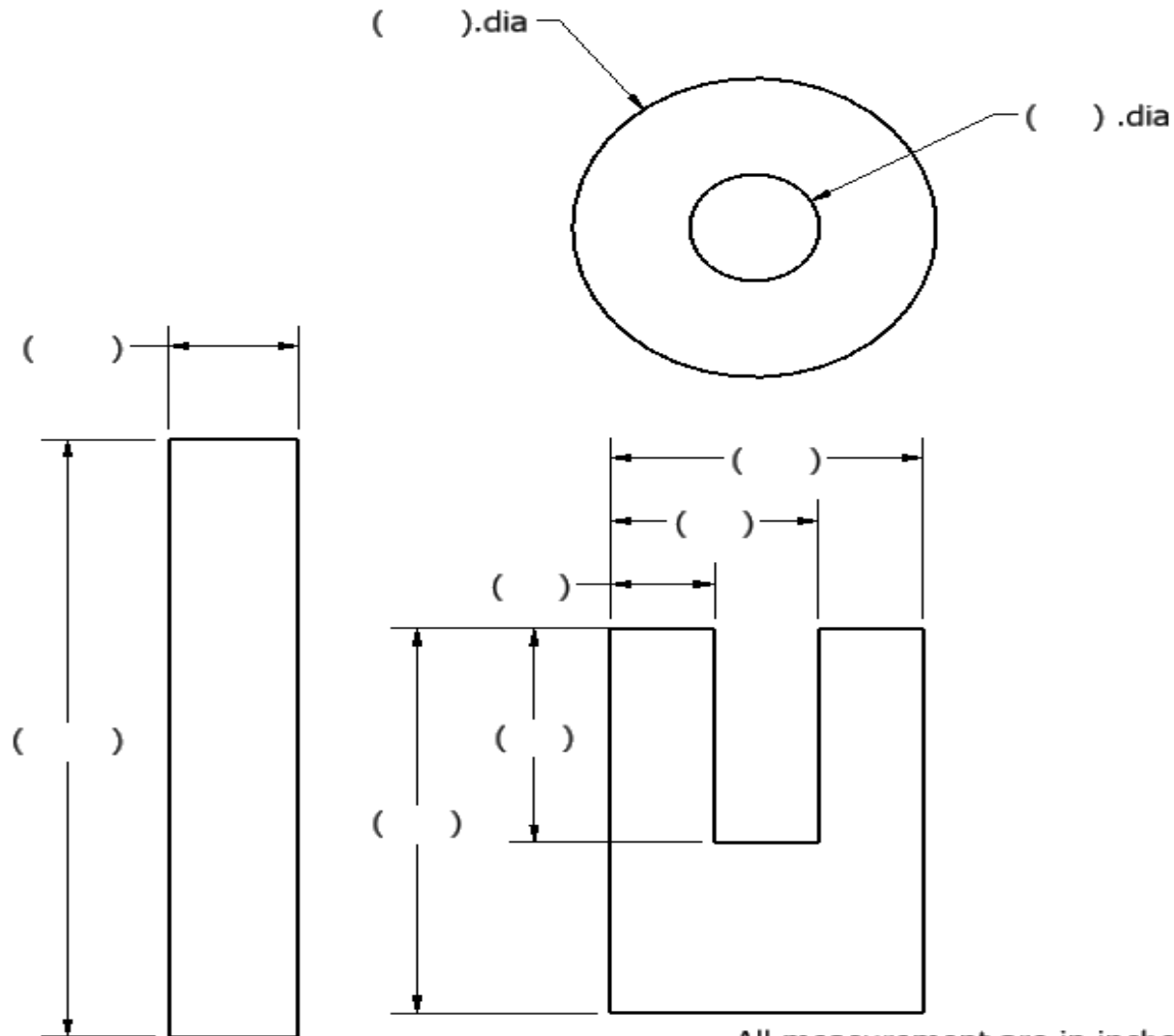


How wide is the block?

$$\begin{array}{r} 1.000'' \\ 0.400'' \\ + 0.002'' \\ \hline 1.402'' \end{array}$$



Practice Time



All measurement are in inches.

