Objective/Learning Target: Students will be able to explain the four types of measurements that can be made using dial calipers, utilize the correct nomenclature when talking about of the parts of the dial caliper, and accurately read a dial caliper.
What is reverse engineering?

Reverse engineering is taking apart an object to see how it works in order to duplicate or enhance the object.

How can we fully analyze the functionality of a part without knowing its design?

The answer is we must fully measure each part to see how they work. At this point, we are doing reverse engineering.
What is reverse engineering?

Take a look at the video of a student’s reverse engineering project.

Squirt gun reverse engineering
What is reverse engineering?

Each of the parts and pieces in the video were drawn in diagram form.

However, if we were to actually design the molds and forms to remake the parts of this squirt gun, we would need to make much more precise design drawings and technical communication.

To do this we would need precise measurements.
There are many different types of precision measurement tools.

Specific hand tools can measure accurately to .001”.

Today we will look at one of those tools, the dial caliper.
Dial calipers are arguably the most common and versatile of all the precision measuring tools used by engineers and manufacturers.
There are 4 methods to use when measuring with a dial caliper.
Inside measuring faces
Dial Caliper Measurements

Step measuring faces
Dial Caliper Measurements

Depth measuring faces
A standard dial caliper can measure up to 6 inches.
The blade scale shows each inch divided into 10 increments. Each increment equals .100”.
The blade is the part that does not move. 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.
The reference edge keeps track of the first digit in the number if it is <1 and the first and second digit in the number if >1.
The dial is divided 100 times, with each graduation equaling one thousandth of an inch (.001).
Every time the pointer completes one rotation, the reference edge on the slider will have moved the distance of one blade scale increment .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.
You can see the blade scale has completely passed 1 and the reference edge is past the .4
You can see the dial is pointing to 37. So we add that number to our 1.4 giving us a measurement of 1.437”
That is how you would read a dial caliper. Now let's practice.
Dial Calipers

Record your reading of the dial caliper.
Dial Calipers

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Youtube tutorial on dial calipers

Metalworking Matt shows how to read a dial caliper