

Precision Measuring Activity

Introduction

The fathom, hand-span, cubit, and other historical methods of measuring were just not accurate enough for engineers and scientists. Many tools have been developed to help take accurate measurements. Micrometers, rulers, and calipers are often used for measuring thickness, internal and external diameters, and depth. Precise measurement with quality tools increases the reliability or accuracy of the data. Precision tools are often used when reverse engineering a part. These measurements provide a better understanding of the interactions of a part so that the engineer can develop a replacement part or improve the existing part. Accurate measurements are important for a successful invention or innovation.

Equipment

- Pencil
- Dial caliper
- Straight edge

Procedure

In this activity you will learn how to use a dial caliper to measure thickness, diameter, and depth.

1. Obtain ten objects from your teacher to measure. For some objects you will measure the thickness, some a diameter, some a depth, so make sure you know what part of the object you are supposed to be measuring.
2. Create a chart in your science notebook with three columns. Label one column "Item to be Measured", the other "My Caliper Measurement", the other "My Straight Edge Measurement". Fill in the name of the object in the column called "Item to be Measured" and measure each item using the two different tools
3. Below your chart in your science notebook, answer the conclusion questions in complete sentences.

Conclusion

1. Which items were easier to measure with the steel edge than the caliper? Why?
2. Which items were easier to measure with the caliper than the steel edge? Why?
3. Which tool provided more precise measurements than the other? Why?
4. Describe three places/items that you think would be important to have a precise measurement. For example, gear ratios on a watch or clock must be exact or you won't know the correct time.