

The Case of the Missing Measurement Tools¹

By: Judi Ewert

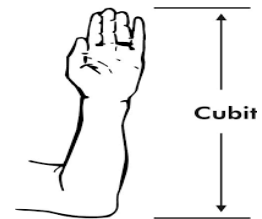
My teacher said, "Goodness, I am sorry but we were supposed to measure items today but I cannot find our tools. I've checked everywhere and our measurement tools are lost."

My fellow student and I high-fived each other agreeing there would be no math today since there were no measurement tools. But we were surprised when the teacher explained another way to do some math, a way used by ancient peoples.

In the 1600's, protractors like the ones we use today were used to measure angles for navigation. Barometers with mercury were also used. When the atmospheric pressure drops, the mercury rises in the tube. In the 1700s, the Greeks used a thermometer similar to ours today.

The Ancient Romans put mile posts on their roads and some are still there today. Each mile was 1000 paces. The English, Greeks, Romans, Chinese and French used the foot to measure distance, but the measurements differed by country. The old foot was 13.2 inches, but today we use 12 inches for a foot. However, some countries use the metric system which does not use the measurement of a foot instead using centimeters and meters.

There must be a reason why we no longer use some of the ancient ways of measurement. Let's explore some old ways and see if we can figure out why they are no longer used. The cubit is an ancient unit of length that may have originated in Egypt close to 5,000 years ago.



You and your partner need to measure the width of a door in your classroom using cubits. Each of you should measure using your own arm as shown in the diagram.

Your measurement: _____ **Partner's measurement:** _____

Is there a difference in your measurement and your partner's measurement? How much _____

A span is the distance measured by a human hand, from the tip of the thumb to the tip of the little finger when your fingers are spread out. In ancient times, a span was considered to be half a cubit. Sometimes the distinction is made between the great span and little span.



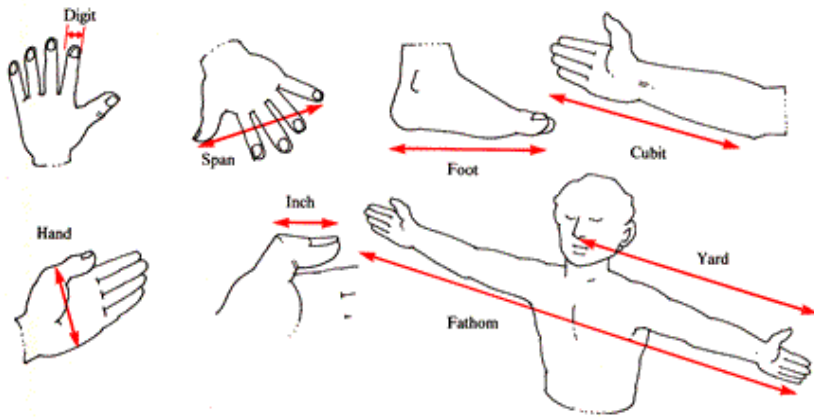
Now, find a cabinet in the classroom. You and your partner must decide one dimension to measure and each of you need to measure it using spans.

Your measurement: _____ **Partner's measurement:** _____

¹ Suggested Grades: 3 – 5 Skills: Solve problems involving measurement and conversion of measurements.

[CCSS.MATH.CONTENT.4.MD.A.1](#) Use ancient tools for measurement and later compare to English Standard measurements.

Now put both your hand and your partner's hand that you used to measure with together. Is there a difference in size and if so, which measurement is accurate?



There were other ways to measure as well. With each of the measures shown, measure parts of the chalk board, cabinets, student desks, a table and a small pencil box.

Hand span used to measure:

Your measurement: _____

Partner's measurement: _____

Inch measure used to measure:

Your measurement: _____

Partner's measurement: _____

Finger span used to measure:

Your measurement: _____

Partner's measurement: _____

Arms, fingertip to fingertip used to measure:

Your measurement: _____

Partner's measurement: _____

Yard as shown above used to measure:

Your measurement: _____

Partner's measurement: _____

Foot as used to measure:

Your measurement: _____

Partner's measurement: _____

Compare the measurements that you and your partner came up with. Are they the same? Why or why not?

Is it important to be accurate when measuring? What problems might we have in our lives when measurements are not accurate?

Why do we have manufactured tools such as a ruler to measure with?

Compare your ruler to your partner's ruler. Do they look different? Now compare the measurements on the two rulers. Are they exactly the same length? In other words, is an inch or a foot on one ruler exactly the same length as an inch or foot on the other ruler?

One student said, "We had a talk about all we learned and it was so fun to do. I had no idea and neither did my partner. Her measurements were always smaller than mine."

The next morning all of the old measurements tools disappeared and we began to measure using our manufactured rulers and tapes. What a difference in our lives!