Why do we need measurements?

In science, measurement is the process of estimating or determining the magnitude of a quantity, such as length or mass, relative to a unit of measurement, such as a meter or a kilogram.

The term measurement can also be used to refer to a specific result obtained from the measurement process.

The word *measurement* is derived from the Greek word "metron," which means a limited proportion.

Some of the earliest surviving measuring devices include gold scales recovered in present-day Greece from the tombs of Mycenaean kings.

The tombs of Egyptian pharaohs — the pyramids — were constructed by builders using no more than simple rulers: the pyramids are regular, symmetric and aligned with the Earth’s axis.

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Babylon, Egypt, and the city states of Greece all had standards for commercial measuring devices.

By about 500 B.C., Athens had its own central depository of official weights and measures — the Tholos.
Introduction to Surveying

Early History of Surveying

- It is impossible to determine when surveying was first used by man.
- “Remove not the ancient landmark, which thy fathers have set” Proverbs 22:28
- The word geometry is derived from the Greek meaning earth measurements.

Types of Surveys

- Land surveys - oldest type of surveys and have been performed since earliest recorded
- Topographic surveys - location of objects and measuring the relief, roughness, or three-dimensional variations
- Route surveys - location of natural and artificial objects along a proposed route for a highway, railroad, canal, pipeline, power line, or other utility
- City or municipal surveys - use to lay out streets, plan sewer systems, and prepare maps
- Construction surveys - locating structures and providing required elevation points during their construction
- Hydrographic surveys - pertain to lakes, streams, and other bodies of water
- Marine surveys - related to hydrographic surveys, but they are thought to cover a broader area
- Mine surveys - relative positions and elevations of underground shafts, geological formations, etc.
- Forestry and geological surveys
- Photogrammetric surveys - photographs (generally aerial) are used in conjunction with limited ground surveys

As-built surveys - provide the positions and dimensions of the features of the project as they were actually constructed
- Control surveys - provides vertical and horizontal reference points
Introduction to Surveying

Types of Surveys

- Lidar (also written LIDAR, LiDAR or LADAR) is a surveying technology that measures distance by illuminating a target with a laser light.
- Lidar is sometimes considered an acronym of Light Detection And Ranging

Geographic Information Systems (GIS)

Top Five Benefits of GIS

The benefits of GIS generally fall into five basic categories:

1. Cost Savings and Increased Efficiency
2. Better Decision Making
3. Improved Communication
4. Better Recordkeeping
5. Managing Geographically

Better Decision Making

GIS is the go-to technology for making better decisions about location. Common examples include real estate site selection, route/corridor selection, evacuation planning, conservation, natural resource extraction, etc. Making correct decisions about location is critical to the success of an organization.
Introduction to Surveying

Geographic Information Systems (GIS)

Any Questions?