Welcome

In this lecture, we are going to address volume and discuss four points:

- What is it in our context
- How can we utilise it
- Why would we need it
- What is volume dot cc

What is Volume?

Volume is a numerical quantity. Its use case is to “quantify” the space which could/can be occupied by some object or substance of interest. It’s not the same as “space” per se, which is the unoccupied available emptiness that surrounds us and many other objects within this known universe.

- Volume is used to quantity a space within a larger space
- Volume always inherits at least 3-dimensions
- If a volume inherits from more than 3-dimensions, it is a hypervolume
- Hypervolumes are not covered in this module but maybe in future (hyperspaces)

How is Volume used?

Volume is a numerical quantity we get when we measure something of interest and use well defined formulas which interleave our measurements into "some" scalar output. This scalar (means singular) output is a volume quantity. It's a 3-dimensional cubic unit, it defines a 3-dimensional spatial quantity and it is expressed as a singleton value.

- Volume is the output of a measurement using well defined formula's
- Volume is expressed in cubic units such as mm^3, cm^3, m^3…. (cm^3 is equal to cc)
- The context in how we use it as an intelligence is a measurement metric
- The distance between distinct unit types mm^3 and cm^3 is simply its resolution
- Tape measures and rulers are used to measure linear inputs
- These input scalars are thereafter used to produce an output volume scalar

Why is Volume important?

Volume provides us with a repeatable measurement standard and allows us to measure 3-dimensional spaces of interest. Well defined formulas allow anyone to repeat these standards anywhere with consistency. They are truly ageless with incredible value because they work, they are reliable and they exhibit the language of the universe.

- High precision volumes are crucial for reliable experiments
- Accurate volumes ensure products meet quality standards and specifications
- Good volume facilitates correct dosages to be administrated in health care
- Food inherits good taste and texture when preparation volumes are consistent
- Volume helps us understand our environment, we can use it to measure water levels, gas capacities (the pressured air that can traverse a series of tubes/pipes…) by measuring the contours which surround these substances of interest.

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Why is Volume important?

- … if we wanted to measure the capacity of a swimming pool, we'd need to solve its volume. Thereafter we'd know how much water it can accommodate.
- … if we wanted to test the tightness of a coolant tube when its manufactured, we'd need to solve its volume. Thereafter we can pressure test it and see what volume loss occurs upon its first feed pressurisation and whether it's acceptable (the quality standard).
- In construction, volume can help us understand what material quantities are necessary to start and finish projects. They permit us to align with regulatory standards since we can estimate capacity to acceptable degrees of precision.
- Shipping and logistics industry rely heavily upon volume measurements since the capacity of containers, vehicles and storage spaces need be known. When known, operators can calculate how many trips are necessary to clear their despatch queue.
- Financial and economic industry can use volume to measure market activity.
- Volume measurements play an integral part within mathematics and physics. Having the tools and ability of learning to measure and understand volumes helps develop important quantitative and analytical skills.

What is Volume.cc?

- Live data platform to compute clean accurate volumes
- Global public calculator accessible through a web application
- Solution for simple and more complex volume requirements
- Removes the need for engineers to make and manipulate error prone spreadsheets
- Streamlines the role of quality engineering by replacing cumbersome business processes
- Replaces out dated conventional forms of communication by providing a data protocol
- Provides a peer-2-peer facility to transmit complex parameters
- Allows volumetric datasets to be distributed from OEM manufacturers
- Acts as a public library for future reference and recall
- Offers a protocol which supports traceability, safety and quality