Volume

Volume

- Volume is the space occupied, especially the measure in cubic units of a three dimensional space of limited extent.

- A carpenter would need to know how to measure and calculate the volume of a solid in order to calculate the amount of concrete that is required.
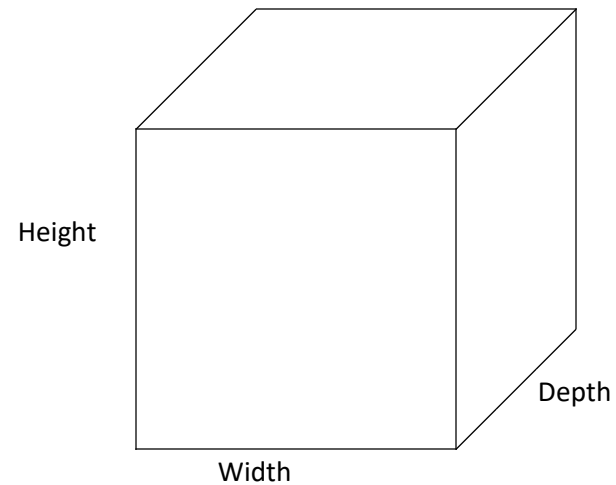
Volume of a Solid (or prism)

Formula

- The formula for calculating the volume of a solid (prism) is:

- $V = H \times W \times D$

Volume (of a cube)

Volume (of a cube)

$$V = H \times W \times D$$

Height

Depth

Width

Measuring Volume

- In construction, volume is measured in cubic inches, cubic feet, and cubic yards.

- A carpenter would need to know how to convert volume from cubic inches to cubic feet to cubic yards.

- Additionally, a carpenter needs to know how to convert between these different units.

Converting Cubic Inches to Cubic Feet

- A cubic foot is one foot high by one foot wide by one foot deep.

  1' x 1' x 1' = 1 C.F.

- Since there are twelve inches in a foot, then a cubic foot is also twelve inches high by twelve inches wide by twelve inches deep.

  12" x 12" x 12" = 1,728 C.I. = 1 C.F.

Converting
Cubic Feet to Cubic Yards

- A yard is equal to three feet (or thirty-six inches).

- A cubic yard is one yard high by one yard wide by one yard deep.

$$1_y \text{ x } 1_y \text{ x } 1_y = 1 \text{ C.Y.}$$

- Since there are three feet in a yard, then a cubic yard is also three feet high by three feet wide by three feet deep.

$$3' \text{ x } 3' \text{ x } 3' = 27 \text{ C.F.} = 1 \text{ C.Y.}$$

Conversions

Conversions

- Cubic Inches to Cubic Feet
  - 1' x 1' x 1' = 1 Cu. Ft.

  and
  - 1' = 12"
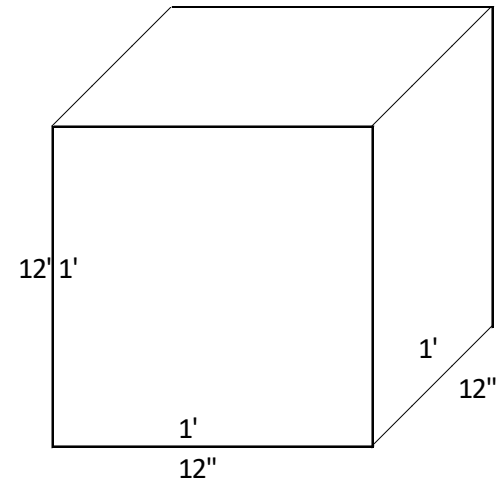
  so
  - Cu. Ft. = 12" x 12" x 12" = 1,728 Cu. In.

  therefore
  - C.I. / 1,728 = C.F.

Conversions

- Cubic Feet to Cubic Inches
    - 1' x 1' x 1' = 1 Cu. Ft.

    and
    - 1' = 12"

    so
    - Cu. Ft. = 12" x 12" x 12" = 1,728 Cu. In.

    therefore
    - Cu. Ft. x 1,728 = Cu. In.
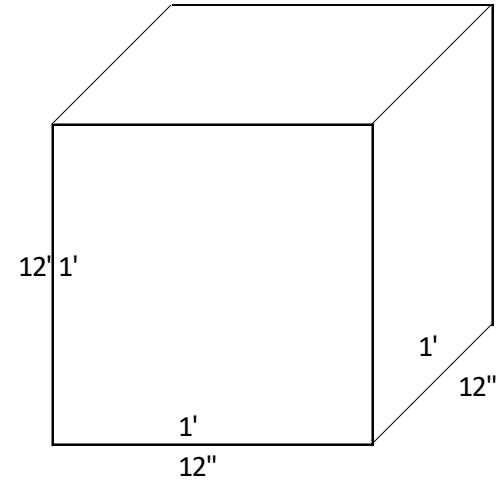
Conversions

- Cubic Feet to Cubic Yards
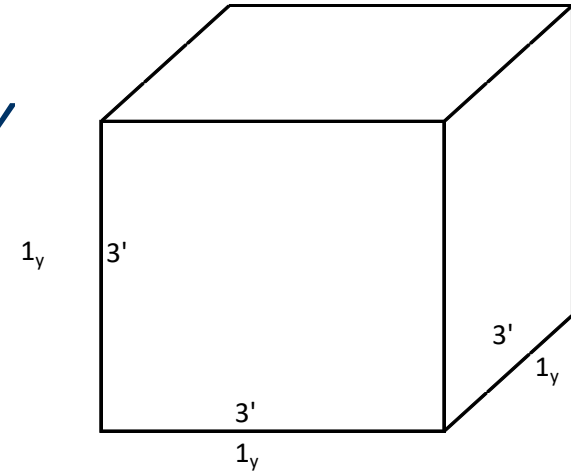 - 1 Yd. x 1 Yd. x 1 Yd. = 1 Cu. Y

and
  - 3' = 1 Yd.

so
  - 1 Cu. Yd. = 3' x 3' x 3' = 27 Cu. Ft.
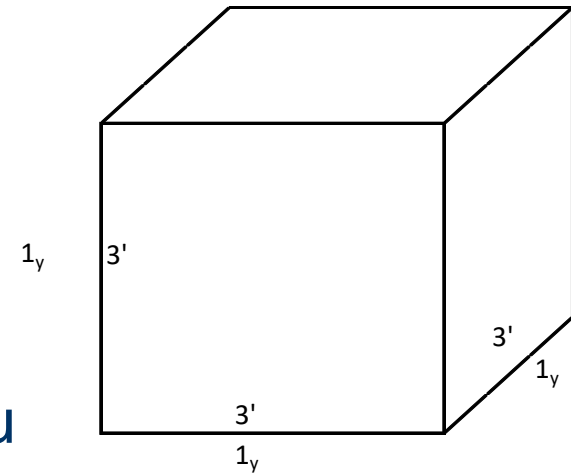
therefore
  - C.F. / 27 = C.YD.

Conversions

- Cubic Yards to Cubic Feet
  - 1 Yd. x 1 Yd. x 1 Yd. = 1 Cu.
  - 3' = 1 Yd.

so

  - 1 Cu. Yd. = 3' x 3' x 3' = 27 Cu

therefore

  - Cu. Yd. x 27 = Cu. Ft.

Conversions

- How to remember.
  - Think "Information For You."

Inches		Feet		Yard
	↔		↔	

Small ←————————————————→ Large

Conversions

Read this side Left-to-Right

$$\frac{x\ C.I.}{1,728} = x\ C.F. \qquad \frac{x\ C.F.}{27} = x\ C.Y.$$

x C.I.

Cubic Inches	⟷	Cubic Feet	⟷	Cubic Yards

x C.I.=   x C.F. * 1,728   x C.F.=   x C.Y. * 27   x C.Y.

Read this side Right-to-Left