

Fractional Ratios

All measurements that are part of a set of measurements are related to each other by a **fractional ratio**.

$$\text{Measure. Ratio} = \frac{\text{Measure Count}}{\text{Total Count}}$$

$$\text{Fractional Ratio} = \text{Ratio} \times \text{Value}$$

The fractional ratio shows the relationship between the **value of measurement** and the **ratio of measurement** between values

Measuring Ratios

$$\frac{\text{Fraction}}{\text{Ratio}}: \text{Value} \cdot \text{Ratio (decimal)}$$

$$\text{Ratio (Decimal)}: \frac{\text{Value}}{\text{Total Value}}$$

Measurement Counts

$$A: 300 \quad B: 400 \quad C: 100 \\ \text{Total: } 800$$

Ratio

$$A: \frac{300}{800} \quad B: \frac{400}{800} \quad C: \frac{100}{800} \\ = \underline{0.375} \quad = \underline{0.500} \quad = \underline{0.125}$$

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Measuring Averages

The average of a measurement set is based on the **fractional ratios**.

$$\text{Average Value} = \text{Sum Fractional Ratios}$$

The **average value** depends on two main factors

1. The difference between the values in the measurement set
2. The actual ratio spread

In many measurement sets, one value has a large ratio, and the average will be close to that measurement set.

Measurement Averages

Ratios

$$A: 0.375 \quad B: 0.500 \quad C: 0.125$$

Values (Measurement)

$$A = 12.75 \quad B = 21.30 \\ C = 25.85$$

Fraction Ratios

$$A = 12.75 \cdot 0.375 = \underline{4.78}$$

$$B = 21.30 \cdot 0.500 = \underline{10.65}$$

$$C = 25.85 \cdot 0.125 = \underline{3.23}$$

$$\text{Avg Value} = \text{Sum Frac. Ratios} \\ = 4.78 + 10.65 + 3.23 \\ = \underline{18.66}$$

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