Ratios and Rates

An archer shoots 60 arrows at a target, with 44 arrows hitting the scoring area and 16 missing the scoring area. How can you evaluate the archer's performance? You can compare the archer's number of hits to the archer's number of misses using a ratio. A ==ratio== uses division to compare two quantities.

Writing Ratios

You can write the ratio of two quantities, a and b, where b is not equal to 0, in three ways.

a to b $a:b$ $\dfrac{a}{b}$

Each ratio is read "the ratio of a to b". You should write the ratio in simplest form (i.e. the GCF $(a, b)=1$

Example 1: **Use the archery information given above. Write the ratio in three ways.**

A. The number of hits to the number of misses.
$$\frac{Number\ of\ hits}{Number\ of\ misses} = \frac{44}{16} = \frac{11}{4}$$
Three ways to write the ratio are $\dfrac{11}{4}$, 11 to 4, and 11:4.

B. The number of hits to the number of shots.
$$\frac{Number\ of\ hits}{Number\ of\ shots} = \frac{44}{60} = \frac{11}{15}$$
Three ways to write the ratio are $\dfrac{11}{15}$, 11 to 15, and 11:15

Rates: A rate is a ratio of two quantities measured in different units. A unit rate is a rate that has a denominator of 1 when expressed in fraction form. Unit rates are often expressed using the word per, which means "for every".