

4.0 Numbers & Statistics (TOP)

The English language is somewhat vague about the presentation of numbers. Therefore, most styles present rules for using even common numbers, such as when to write a number as a word and when to write it as a numeral. Precise measures are always presented as numerals in the metric system in APA style; nonstandard symbols are used for some of its statistics. See the *APA Manual* if you are presenting your own mathematical formulas.

4.1 Common Numbers (TOP)

■ **Spell out common numbers under 10.** "Use figures to express numbers 10 and above and words to express numbers below 10" as long as the numbers below 10 do not express precise measurements and are not grouped with numbers above 10 (APA, 2009, p. 111).

- Spell out common fractions, common expressions, and centuries (one-half, Fourth of July, twentieth century).
- Spell out all numbers beginning sentences (Thirty days hath September . . .).
- To make plurals out of numbers, add s only, with no apostrophe (the 1950s).
- When numbers below 10 must be mixed with numbers above 10 in the same sentence they should be written as numerals. For example, write "the students trying out for the soccer team included 5 girls and 16 boys."
- Use words and numerals with two numbers in series (five 4-point scales).
- Use combinations of numerals and written numbers for large approximate sums (over 3 million people).

Use numerals for numbers 10 and above, for exact statistical references, scores, sample sizes, and sums (multiplied by 3, or 5% of the sample).

- Use metric abbreviations with physical measure (4 km) but not when written out (many meters distant).
- Use the percent symbol (%) only with figures (5%) not with written numbers (five percent).
- Put a leading zero before decimal fractions less than one (e.g., 0.25 km), unless the fraction can never be greater than one, as with statistical probabilities (e.g., $p < .01$).
- Ordinal numbers follow the same rules as other numbers. Spell out ordinals below 10: first, second, . . . ninth. Use numerals for ordinals 10 and above: 10th, 43rd, 99th, and so on. Exception—the twentieth century.

Use numerals for all numbers "that denote a specific place in a numbered series, parts of books and tables, and each number in a list of four or numbers" (APA, 2009, p. 115). Write Grade 6 (but sixth grade); Trial 5; Table 6; page 71 (do not cap page); chapter 8 (do not cap chapter); 2, 4, 6, and 8 words in a series.

Use numerals for all "numbers that represent time; dates; ages; sample, subsample, or population size; specific numbers of subjects or participants in an experiment; scores and points on a scale; exact sums of money; and numerals as numerals" (APA, p. 124). But, spell out approximate days, months, years (new). "She has about fifteen years remaining on her jail sentence."

4.2 Precise Numbers (TOP)

■ The APA requires the use of the metric system in its journals. This is formally known as the International System of Units, or SI (from the French *Le Système International d'Unités*). The lead authority on the SI in the United States is the National Institute of Standards and Technology (free guide: <http://physics.nist.gov/Document/sp811.pdf>). The APA would prefer you to visit their website, www.apastyle.org.



Numerical Value SI numbers have three parts: the numerical value, the prefix (multiplier), and the unit symbol (abbreviation). Each of these parts is strictly defined. The number 25.3 kg is an SI number. Numbers are always

formatted in plain text (no italics), there is *always* a space after the numerical value (never a hyphen or other character), there is never a period after the units (except at the end of a sentence).

Numerical values are presented without commas in SI notation. For example, the distance between Chicago and Denver is 1600 km (not 1,600 km). The *km* stands for kilo-meters. The prefix kilo indicates the units are multiplied by 1000. There are about 1.6 km to a mile. If it is important for clarity you can note the conventional U.S. measure in parentheses after the SI number: 1600 km (1000 miles).

- There is *always* a space after the numerical value, and *only* a space. This can look awkward. For example, the temperature at the beach was 25 °C, or about 77 °F today. There is a space after the numerical value before the degree symbol and temperature abbreviation. Conventional notation, 77° F, is not an acceptable SI number.
- Common prefixes are k (kilo-, multiply by one thousand), M (mega-, multiply by one million), and m (milli-, multiply by one-one thousandth [0.001]). For example, KVOD broadcasts at 88.1 MHz. A *Hertz* is a measure of frequency, after a man by that name, so the abbreviation is capitalized *Hz*. A complete listing of prefixes is found in the *APA Manual* (2001, Table 3.5), and the *NIST Guide* (1995, Table 5).
- Units of measure are always abbreviated when presented with numerical values, but written out when noted in the text *without* a numerical value. For example, a liter is about a quart; "It took 22 L to top off the gas tank."
- Units of measure never take periods or other punctuation except at the end of a sentence.
- Numerical values less than one are preceded by a zero. For example, one yard is 0.91 m, or about three inches short of a meter. An exception is made for statistical values that by definition cannot be greater than one, for example the probability, $p < .05$.

No hyphens, no periods! The SI is not subject to rules for compound adjectives. For example, it is proper to write: "She won the 50-yard dash." It is NOT correct to write: "He was prescribed a 50-mg dose." A 50-mg dose could be interpreted as a 50/mg dose (i.e., 50 ^{-mg} in SI notation); 50 units of something per milligram of body weight. A mouse weighing 30 g (about an ounce) would require a 1,500,000 unit dose! Nothing but a space is ever inserted between a number and unit of measure.

Exception. When an instrument is calibrated in U. S. conventional units these may be presented followed by the SI measure in parentheses. For example, the thermometer at the beach read 77 °F (25 °C); the maze was laid out with a tape measure on a 3 ft by 3 ft (0.91 m x 0.91 m) grid pattern.

4.3 Statistics (TOP)

■ **Most symbols** for statistics are placed in italics (exceptions are very rare). Nonstandard symbols are used for some common statistics (check the *APA Manual*, Table 3.9, for a complete list of accepted symbols):

M = mean (\bar{X}), SD = standard deviation (σ), Mdn = median, SS = sum of squares (ΣX^2).

Descriptive statistics give summary information about a sample or population, such as the average (mean) or standard deviation of some characteristic. For example, "Abigail Scribe has a GPA of 3.65, which is below the average for students accepted at Ivy and Oak University ($M = 3.85$, $SD = 0.21$). Descriptive statistics may be presented in the text with the appropriate syntax (e.g., "a GPA of 3.85"). When referred to indirectly they are set in parentheses, as with ($M = 3.85$, $SD = 0.21$).

Inferential statistics reason from a sample to the characteristics of a population, often expressed as a probability. For example, "Abby Scribe has a chance of being accepted at Ivy and Oak University ($p < .15$), but counselors advise her that her odds are not great based on last year's applicants, $X^2(2, N = 2247) = 2.81$, $p < .15$ (one-tailed)." Inferential statistics are presented in the text (no parentheses) with "sufficient information to allow the reader to fully understand the results of the analysis conducted" (APA, 2009, p.116). The following examples from the *APA Manual* (p, 117):

$$t(117) = 3.51, p < .001, d = 0.65, 95\% \text{ CI} [0.35, 0.95]$$

The first number in parentheses is degrees of freedom of the analysis; "95% CI" stands for 95% confidence interval.

 "Space mathematical copy as you would words: $a+b=c$ is as difficult to read as words without spacing" (APA, 2009, p. 118). Place a space before and after all arithmetic operators and signs (=, <, >, -, +, etc.); $a + b = c$.