

APA Displaying Results

This guideline was written to handle the growing confusion for students regarding APA format due to increasing exposure via the internet. There is only one official APA manual, but it is often updated over time when needs arise. When an update comes out, it becomes the official APA manual governing the writing of science and psychology papers. However, the older versions can still be found and are often still used by many institutions. Furthermore, researchers and professors use variations of the APA style to suit their needs and publication demands (for example, Chicago Style, IEEE Style, AAA Style; not to mention MLA Style used for English papers). The Thames Valley District School Board has an online-only version, *On Your Own*, based on the official fifth APA manual (and includes MLA and Chicago Style). The board also still supports an older version of *On Your Own*, available online and in print, which is based on the fourth edition of the official APA manual. Therefore, it is understandable that much confusion exists as to which style is the correct style to use.

Clarity and consistency are most important with APA Style so we will use the following guideline in my class as our definitive manual to write papers and how they will be marked when APA formatting is required. My goal is to simplify APA for high school students, so I may circumvent some of the rules just to make it easier as I am only trying to help you learn how to make a proper science report; I am not creating a complete guideline as one already exists (the official APA manual). Therefore, I have outlined the major, most commonly needed, instructions but there are numerous rules to cover the immense variety of situations that can exist, so if a situation is not covered here, refer to the **official APA guide** posted on my website.

Issue

Scientific conclusions are not generated easily and what most people interpret as scientific facts are really tentative theories generated from copious amounts of replicated observations. The quality of these conclusions demands that these observations be without bias and as flawless as possible. This means great trust must be placed upon accurate representation of these observations and this requires considerable clarity and consistency. APA guidelines regarding how this information is conveyed is exact and paramount. Reading and interpreting this data must be without doubt.

Tables

Typically, data is tabulated; that is, it is systematically recorded in a table which allows diverse analysis. In doing so, relationships can be discovered and reported to generate theories to account for the underlying reasons for the relationships. This is how our scientific understanding grows.

The first key component of any table is its title. The official APA manual specifies that table titles and figure captions (the equivalent of a title for a figure such as a graph) are written with opposing styles mixing italics and regular texts. According to the current official APA manual, the table title number is regular text and the heading is italicized. Also, officially, underlining is not used for either the table title number or heading. However, many high school students continue to print or write reports by hand and italicizing is difficult to create and interpret for larger bodies of text so we will use a different approach. The table title number will be underlined, be preceded by the word Table (with a capital) and followed by a colon (:). The number itself is always expressed numerically rather than written out in full even for numbers one to twenty. Although not required, if you wish, you may bold the table title number. The table title number and heading appear at the top of the entire table. The number increases in order for each subsequent table. The heading is unique for each table.

The heading that follows the table title number will be block indented to align after the table title number and will not be italicized. Although this deviates from the most current official APA manual, it actually was supported by the earlier versions and aligns more with current TVDSB versions. This will create more consistency for high school work.

The heading of a table is typically one, rather long, sentence, but some students find it easier to construct more than one sentence which is quite acceptable. Proper sentence structure and punctuation must be used. The heading is very explicit; in fact, one can immediately interpret the entire scientific investigation simply by reading the table heading. Three pieces of critical information are displayed in the heading. First, data being presented is clearly identified including all the vital components (what is the data). Next, the origin of the data is outlined by identifying the specific factors or variables that created the data (from where does this data come). Finally, the purpose of the data is identified in terms of the proposed outcome (what is this data attempting to present). These three statements are actually not outlined in any APA manual, but we will use them because they greatly aid student understanding of their data and ensure full understanding of the entire scientific investigation. It will be tempting to include as much detail as possible; however, this is actually a serious error as the extra information implies that it is critical and affected the outcome of the experiment and this often is not true. Only include the information that is needed and unique for the specific experiment conducted. Note that if the data table is not your own data; that is, you are just researching an experiment from a source, you must include a citation in the table heading. Also, you must not copy the source's figure caption directly because you are supposed to be interpreting this work and not copying or quoting.

Writing a good table title is extremely hard; it may be the hardest component of an experiment. I recommend completing it last in the report to ensure you have had enough time to really come to terms with the purpose and outcome of your experiment.

Each table must be referenced in the body of the report at some point. This can be accomplished directly (for example by stating something like....table 1 outlines.....or as revealed by table 3) or it can be indirectly referenced (for example: masses were recorded (see table 1)). Note that the table title number is also expressed numerically in the body of text unlike other numbers (0-20) in the report).

The table of data is constructed with explicit and unique row headings and column headings which clearly outline what is being depicted. Generic terms can be used, but not without further providing distinct clarification; that is, more information must be included. The table set up must convey this information in the best format possible to avoid confusion or misinterpretation. According to the official APA manual, only horizontal lines separate rows while consistent spacing separates columns; however, if you wish, you may use horizontal lines as well. Entries within columns and rows are typically centered both horizontally and vertically. Abbreviations are not used except for units of measurements (if you wish). The table of data is centered under the table heading.

APA guides do not distinguish types of data tables, but we will. Specifically, a data table will only contain collected data; whereas, a results table contains both collected data and any required calculations or summaries for analysis. We apply this distinctions because our scientific investigations are rarely complete research papers so they serve specific purposes in high school. Make sure you use the type of table requested. Also note that the data expressed reflects the precision of the measurements made when the data was collected; that is, the number of decimal places matches the measuring device and the units are appropriate to reflect meaningful distinctions (you would not express the distance to the sun in mm or the length of your fingernail in km).

For example (a data table):

Solution Temperatures (°C)	Copper(II) Hydroxide Height on the Bottom of a Test Tube Over Time		
	0.0 seconds	30.0 seconds	60.0 seconds
5.0	0.0 mm	0.1 mm	0.5 mm
10.0	0.0 mm	0.4 mm	1.2 mm
15.0	0.0 mm	0.7 mm	2.8 mm

Figures

Once data has been tabulated, it is always analyzed and since science studies relationships, the best way to do so is by creating graphs or pie charts and etcetera. This are called figures, but they are not the only types of figures which can include diagrams and pictures. All figures are treated the same way, but I will be focusing on data figures.

Similar to tables, one key component is the title which is actually called the figure caption. According the current official APA manual, the figure caption number is italicized while the heading is regular text (opposite to table titles) and again, officially, underlining is not used for either the figure caption or heading. As already outlined, we will handle this in a different way for efficiency, consistency and clarity for high school purposes. The figure caption number will be underlined, be preceded by the word Figure (with a capital) and followed by a colon (:). The number itself is always expressed numerically rather than written out in full even for numbers one to twenty. Although not required, if you wish, you may bold the figure caption number. The figure caption number and heading appear under the figure. The number increases in order for each subsequent figure. The heading is unique for each figure but closely aligns to a data or results table if it represents data analysis. Since there is a figure caption, there is never a figure title at the top of the figure.

The heading that follows the figure caption number will be block indented to align after the figure caption number. The heading a figure caption is typically one, rather long, sentence, but some students find it easier to construct more than one sentence which is quite acceptable. Proper sentence structure and punctuation must be used and the heading is very explicit. For data analysis, three pieces of critical information are displayed in the heading. First, data being presented is clearly

identified including all the vital components (what is the data). Next, the origin of the data is outlined by identifying the specific factors or variables that created the data (from where does this data come). Finally, the purpose of the data is identified in terms of the proposed outcome (what is this data attempting to present). Just as with tables, this is not outlined in any APA manual, but we will use them because they greatly aid student understanding of their data and ensures full understanding of the entire scientific investigation. It will be tempting to include as much detail as possible; however, this is actually a serious error as the extra information implies that it is critical and affected the outcome of the experiment and this often is not true. Only include the information that is needed and unique for the specific analysis conducted. For example, unlike the tables which include all of the data, a graph only includes analysis of the data such as averages and this must be reflected in the caption. Note also, that if the graph is not your work; that is, you are just researching an experiment from a source, you must include a citation in the heading and the heading must be in your own words. Writing a good figure caption is also hard and will take practice, but it will be somewhat easier once you write the table title heading.

Each figure used must be referenced in the body of the report at some point. This can be accomplished directly (for example by stating something like....figure 2 outlines....or as revealed by figure 4) or it can be indirectly referenced (for example: masses were recorded (see figure 3). Note that the table title number is also expressed numerically in the body of text unlike other numbers (0-20) in the report).

The figure itself is quite unique in that the type of data displayed and how it is arranged greatly impacts the usefulness and clarity of the analysis. For data analysis, the proper type of graph must be used and it must be set up appropriately (dependent variable on y-axis, explicit axis titles, units, scales, data points or no data points, trend or point-to-point and etcetera) and this will change depending on the situation which will be determined by the investigation. Generic terms can be used, but not without further providing distinct clarification; that is, more information must be included. The figure set up must convey this information in the best format possible to avoid confusion or misinterpretation. A legend may be needed if more than one relationship is depicted, in which case it is included to the right of the data, but within the figure, but only include one if needed. Abbreviations are not used except for units of measurements (if you wish). Colour must not be used to display data; rather, use symbols or shading. The figure is centered over the caption.

Software-generated data figures can be quite complicated, thus, ensure that data reflects the precision of the measurements made as best as possible in terms of decimal places but make sure the units are appropriate to reflect meaningful distinctions. Often, high school students find it easier to create data figures by hand.

For example:

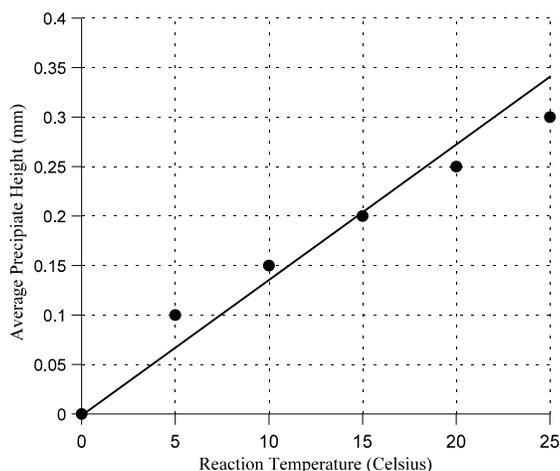


Figure 1: Average height of copper(II) hydroxide precipitate collected at the bottom of a test tube measured after 60 seconds of mixing 5.0 mL of 1.0 M sodium hydroxide with 5.0 mL of 0.1 M copper(II) maintained at various temperatures in order to determine the sedimentation rates of the copper(II) hydroxide precipitate formed.

