**Use of Evidence in Mathematics**

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When completing a constructed response problem it is important to show evidence using multiple formats. Acceptable formats can include verbal description, two column verification, diagrams, charts, tables, in addition to the mathematical calculations. The student’s use of multiple evidences in solving one problem allows the reader to verify depth of conceptual knowledge. In reading a student’s math work, the final answer to the problem does not give the teacher information on the students’ thought processes or skills. If an answer is wrong and there is no work leading up to the answer, it can only be marked wrong. There can be no educational discussion of what went wrong in the calculation. The teacher has no evidence to refer to in helping a student with either a conceptual error or a calculation error.

A *verbal description* allows the students to communicate knowledge of the mathematics. Written verbal descriptions allow readers to be guided through the students thought processes. The verbal communication allows for students to discuss mathematics with each other and collaborate.

Some students state that they need to see what is going on in the math problem. A *diagram* gives a concrete picture or representation of the math situation. Diagrams can be used as a pre-write for a problem. By creating a diagram before solving the problem is students can organize the information. Also in creating a diagram for mathematical problem the students are using both sides of their brain.

*Two column verification* has the math calculation step by step in one column and in the second column is a description of what is happening in each step. This description is generally the mathematical properties that have been used to solve the problem. the two column display of mathematics is often used in textbooks for example problems. So it is important for students to not only be able to create this description of the mathematics but also to be able to read this description of mathematics as a learning tool.

*Charts and tables* give a pictorial display of the mathematics represented in a problem. Again depending on the student’s creativity in making a chart or table, a student can be using both sides of the brain working mathematics. With increase in accessibility for creating infographics, students can make connections between pictures and the mathematical information. As the saying goes, a picture is worth a thousand words.

Step-by-step *mathematical calculations,* recorded by the student, allows the teacher to examine the students thought processes. examination of this work can guide conversations during teacher – student consultation.

The use of multiple evidences and mathematics is important to the educational process for the student. Therefore, teachers need to use multiple displays of information while teaching as well as require students to use multiple evidence in constructed responses.