

CONCEPT DEVELOPMENT

In mathematics classrooms that lack sufficient concept development, memorization of rules and algorithms is emphasized but little or no attempt is made to help students understand the “why” of mathematics processes. Concept development should be as important as memorizing basic facts and algorithms. Students understanding of, and comfort level with, new ideas is increased when concept development is done properly.

Sometimes students are able to “get the right answer” even though they don’t necessarily understand the “why.” Mathematics then becomes an arbitrary set of isolated rules which can often lead to future pitfalls. As mathematics becomes more abstract, “math anxiety” may develop if these rules and algorithms have not been developed with an understanding of why they work. Eventually, students can become frustrated and quit taking math, even though the grade they earned in their last class was average or above.

Developing concepts and linking those ideas to students prior experiences helps to explain the “why” and makes students more comfortable in their knowledge and understanding of mathematics. For example, rather than just having students “flip and multiply” when dividing fractions, the division algorithm might be developed through use of repeated subtraction. Solving equations should be connected to the “Order of Operations.” Finding the sum of the interior angles of a triangle might be introduced by having students cut out angles in triangles and piece them together. The Pythagorean Theorem might be explained by using the areas of the squares formed by the sides.

Unfortunately, students all too often “tune out” teachers during concepts development. Since students value what teachers test, concept development must be tested. Students might write a brief explanation of the development of a particular concept as a part of the homework assignment, and then be asked an open-ended question on a test where they must explain the origin of a rule or algorithm