

~ Linking Content ~

Linking new concepts and skills to previously learned math and outside experiences increases student understanding and achievement.

Linking allows teachers to introduce new concepts and skills using familiar ideas and language, which results in students being more comfortable in the in their knowledge, understanding and application of math.

Linking allows teachers to remediate as they teach their curriculum by reviewing and reinforcing previously learned mathematics. It also provides opportunities for interventions by allowing teachers to address student deficiencies.

Linking allows teachers and students to see how the math learned in the classroom can be used in different contexts which enhances their understanding of those concepts and skills

Linking encourages vertical articulation between grade level teachers. Elementary teachers see how the foundation they are laying leads to the success of their students. Secondary teachers see how they can better introduce new concepts and skills by scaffolding on what students already have learned.

For example, rather than introducing the topic of polynomials by name and using new terms such as monomial, binomial, and trinomial, students would be better served if the teachers introduced polynomials by reviewing place value and expanded notation (topics from 1st and 2nd grades), then showing the students how to add numbers from left to right using place value. By reviewing and reinforcing these topics first, the transition to adding/subtracting polynomials will be much easier for the students in algebra.

Teachers could relate functions to buying cold drinks; one cold drink is \$.50, two is a dollar, three is a dollar fifty, etc. Writing these in ordered pairs, we'd have (1, .50), (2, 1.00), (3, 1.50), etc. By introducing functions by using concrete examples, it would make a great deal more sense to students. Having a teacher introduce a function by giving the following definition often results in eyes glazing over. *A function is a special relation in which no two ordered pairs have the same first coordinate.*

Teachers should take the time to link concepts and skills to previously learned mathematics and outside experiences. The Pythagorean Theorem, for instance, can be linked to areas of squares, similar triangles, the distance formula, equation of a circle, and the trig identity ($\cos^2x + \sin^2x = 1$). By introducing these concepts and skills using linkage, teachers can save instructional time by not completely re-teaching the Pythagorean Theorem in its different forms and they would be reviewing and reinforcing knowledge and skills teachers indicate the students do not possess.

What students will begin to realize is the greatest differences between what was taught in elementary school and higher level mathematics is vocabulary and notation. Teachers should take care to point that out so students are more comfortable learning “new” concepts and skills.

In order to create interest and enthusiasm in mathematics, teachers should also relate/link how concepts taught in the classroom are used in the real world, whether it be how the size (circumference) of tire affects the speedometer and odometer readings in a car or how it is used in pipefitting. Be able to find the vertex, focus, and directrix of a parabola might be better received if students understood how those are related to flashlights, lasers, satellite dishes or acoustics. Students might take a greater interest in math if they understood the topics they are learning can be used in decision-making, such as which phone company to use based on their rates when solving systems of equations.