TO ADD OR NOT TO ADD

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“To add or not to add?” That is the question.

At an early stage in the primary level, learners are taught how to add and subtract numbers using different methods and techniques. Preschoolers are taught to combine or take away tangible objects to better teach them the concept of the two operations. Elementary students are introduced gradually to the operations by adding levels of complexity on the given equation or problem – from single digit numbers to double digits and so on. Also, they are taught the difference between adding and subtracting two quantities.

But as they approach the world of integers (or signed numbers) and algebra (involvement of letters or variables), confusion is primarily developed in the learners. This leads to the development of the thought that they are always having difficulty in performing such operation due to confusion.

“To add or not to add”. Learners become confused on the application of the operations from plain counting numbers to positive and negative signed numbers. In basic addition, 7 plus 8 is equal to 15. But in addition of integers, several answers may come up depending on the affixed sign of the integers. Thus, the operation indicated may be addition but the operation to be performed becomes either addition or subtraction.
Such are examples:

\[(+7) + (+8) = (+15)\]

\[(-7) + (-8) = (-15)\]

\[(+7) + (-8) = (-1)\]

\[(-7) + (+8) = (+1)\]

And there goes the dilemma whether “to add or not to add”.

It is quite basic to perform the task of adding integers. Learners must only familiarize themselves and know the rules in adding integers by heart.

To add integers with the same sign, find the sum of their absolute value and use the sign common to both integers (Oronce and Mendoza, 2012). The absolute value of a number is equal to the distance of the number from the origin (0) in a number line. Or simply put, it is the value of the number, regardless of its sign (positive or negative).

To add integers with different signs, subtract the absolute value of the integers and copy the sign of the integer with the greater absolute value.

Also, to avoid confusion from the operation to be used, instead of using the word “ADD”, it is more appropriate to use the verb “COMBINE” to denote the operation. Thus, learners will not just view or understand it as addition itself, but will also recall that subtraction may also take place. Most of the time, the terms used to present the operations to be performed tend to start the confusion among learners. Restating the direction using more appropriate words will help a lot.
Now, at the instance that the students have perfected (or almost) the operation on integers comes algebra. Algebra is a branch of mathematics which generalizes the facts in arithmetic. In the language of algebra, letters or variables along with numbers or constants and operation symbols are used to create expressions. (Oronce and Mendoza, 2012)

And as the study of algebra proceeds, learners eventually encounter operations on polynomials. A polynomial is an algebraic expression that represents a sum of one or more terms containing whole – number exponents on the variables. In addition of polynomials, rules in adding integers apply. But in addition to it, there is a consideration taken with regards to the variable or literal coefficient of the terms. Only like terms are combined while unlike terms are copied to form the sum of the polynomials.

Such are examples:

\[(2a) + (5a) = 7a\]

\[(2a) + (-5a) = -3a\]

\[(2a) + (-5b) = 2a - 5b\]

\[(4a + 3b) + (5a - 2b) = 9a + b\]

\[(6x^2 + 2x - 11) + (4x - 12) = 6x^2 + 6x - 23\]

Again, mastery of the operation lies in the familiarization of learners in like and unlike terms. Like terms have common variables, including the exponents. Only like terms in polynomials are combined when performing the operation.

To further develop the skills of the learners with regards to such operations, certain drills and routines can be performed as way of honing their skills and promoting mastery.
Mathematics, as a skill subject, requires constant practice and activities that will help students attain the goal of developing abilities that lead to better critical thinking and problem solving skills.

References: