Essential Understandings of Addition and Subtraction for Teaching Mathematics in PreKindergarten-Grade 2

BIG Idea ONE: Addition and subtraction are used to represent and solve many different kinds of problems.

Essential Understanding 1a. Addition and subtraction of whole numbers are based on sequential counting with whole numbers.

Essential Understanding 1b. Subtraction has an inverse relationship with addition.

Essential Understanding 1c. Many different problem situations can be represented by part-part-whole relationships and addition or subtraction.

Essential Understanding 1d. Part-part-whole relationships can be expressed by using number sentences like $a + b = c$ or $c - b = a$. where a and b are the parts and c is the whole.

Essential Understanding 1e. The context of a problem situation and its interpretation can lead to different representations.
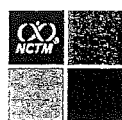
BIG Idea TWO: The mathematical foundations for understanding computational procedures for addition and subtraction of whole numbers are the properties of addition and place value.

Essential Understanding 2a. The commutative and associative properties for addition of whole numbers allow computations to be performed flexibly.

Essential Understanding 2b. Subtraction is not commutative or associative for whole numbers.

Essential Understanding 2c. Place-value concepts provide a convenient way to compose and decompose numbers to facilitate addition and subtraction computations

Essential Understanding 2d. Properties of addition are central in justifying the correctness of computational algorithms.