

Kindergarten

The models used in Kindergarten are used to help students understand numbers, make sense of relationships among numbers and begin to develop strategies for addition and subtraction.

First Grade

The models in 1st grade are used to help students compose and decompose numbers, make sense of relationships among numbers, understand place value, develop strategies for basic addition and subtraction, and begin to add and subtract with multi-digit numbers.

Second Grade

The models in 2nd grade are used to help students structure number, continue to develop and apply place value understandings, and develop efficient strategies for computing with multi-digit numbers.

Third Grade

The models in 3rd grade are used to help students develop strategies for computing with multi-digit numbers, with a focus on multiplication and division.

Fourth Grade

The models in 4th grade are used to help students develop efficient strategies for computing with multi-digit numbers, as well as analyzing fractions, and decimals.

GRADE	MODELS	PICTURE	HOW AND WHY THE MODEL IS USED
	Number Line and Double Number Line		<p>Students in 4th grade will use the number line to compare and order fractions and decimals. By reasoning about the relationships between the numbers, students place fractions and decimals on a number line given the position of other numbers already placed. In addition, students will use paper strips, egg cartons, geoboards and base ten pieces to model, read, write, compare, compose and decompose fractions.</p>
	Open Number Line		<p>The open number line is used to show how repeated addition is related to multiplication. It is also used to model addition and subtraction strategies such as give and take or constant difference.</p> <ul style="list-style-type: none"> • Give and take is moving one part of a number to the other numbers to make addition easier. • Constant difference is adding or subtracting the <u>same value</u> to both numbers to make the subtraction easier
	Array or Area Model		<p>Students build on this model from 3rd grade by continuing to work with multiplication and beginning division. They expand the model by using closed arrays, base 10 and linear pieces, and then open arrays.</p> <ul style="list-style-type: none"> • Closed array- they count each square units by 1. • Base 10 and Linear array- the area is modeled in bigger chunks, tens and ones, and the dimensions are defined by the linear pieces helping students distinguish between area measures and linear measures. • Open array- arrays are chunked together in pieces that are convenient and efficient for the problem. <p>While students will discover many ways to solve multiplication and division problems, the array model provides a way for them to discuss their strategies with one another, decompose (break apart) the numbers, apply the distributive property, and identify partial products.</p>
	Ratio Table		<p>Ratio Tables in 4th grade continue to build an understanding about multiplication and the relationships between numbers. Later, the ratio table becomes a tool for students to use when problem solving, computing multiplication, division, and fraction problems, as well as make conversions. This model will continue to be used in higher grades as well.</p>
	Base Ten Area Pieces		<p>Base ten area pieces are important in introducing the standard way to add and subtract because they focus on place and value. Because this model was in 3rd grade, students in 4th grade are expected to transition very quickly from base 10 pieces to numbers. In addition, base 10 pieces can be used to model fractions when the large square is assigned a value of one.</p>

