Big Idea of Equality	What Might It Mean?	What might be evidence of understanding?
Student can match quantities without counting. In primary: Students are expected to subitize quantities of 2 , 3 and 5. In upper elementary we expect they see equivalence with fractions and decimals as automatic.	Students match small sets. They may physically match one to one. They might pair objects. They might just look and know.	Matched the quantity accurately. Student does not need to count or prove by counting. Simply agree that these are equal because they are the same amount . Attributes of objects.
Student is able to explain why sets whose objects have been matched have same number: one to one correspondence, automatic recognition of parts or wholes or both (subitize, part whole relationships), conservation of quantity. Matching the pattern or arrangement	Students are expected to discuss and explain how they know these sets are equal. I lined them up and they match, there is one for each. I counted and they are the same amount. I saw they fit the same space. They are arranged the same. They are the same length. I moved them in my head, they are the same.	Demonstrate a strategy, describe a strategy, create an equation and diagram the strategy. (Number Lines, strings, folding, covering equal spaces. These fit on each other. These line up. These fill the same container to the same point. These hold the same position on the numberline “making ten” strategy with ten frames Eg • 7 + 8 = 5 + 2 + 8 = 5 + 10 • 15 is the same as 10 + 5; 8 + 7; 9 + 6; 2 + 13 • 37 is the same as 20 + 17; 30 + 7; 35 + 2 • 457 + 243 is the same as 460 + 240

Student recognizes rearranging does not change the equivalence	Equality is set up. Students agrees. Items on either side are re-arranged, moved apart, traded across or substituted but if the quantity does not change the equality is not affected.	Are these equal? Show picture, show equation, show expression Does the equal sign fit here? What do I have to do to “balance it” Here is an equality, Build and Explain why it is true or “balanced” Change it but keep it balanced. 7 = 5 no add 2 or subtract 2 or move one over 3 + 4 = 7 yes could change both sides and still be equal as in 4 + 3 = 2 + 5 7 = 3 + 4 etc.
Student recognizes that number can be an attribute used to sort sets.	These go together because they all have 5 in them. These go together because they are all ways to demonstrate 6. These all equal 1/2. These are all ways to show 1 Equivalent fractions, equivalent areas, equivalent volumes	Students identify equality based on same number of things. Students replace the stuff with numbers and then confidently manipulate those numbers These are acceptable equations about equal: • 5 = 5 (there does not have to be an operation sign) • 2 + 3 = 5 • 5 = 2 + 3 • 2 + 3 = 3 + 2 • 1 + 4 = 2 + 3 Student identifies sets that are equal and identifies why: contain same amount (strictly a count), or share a

		common measure as in equal weight, equal length, equal capacity or volume. Student creates an equality to match a given equation. Student identifies sets that are not equal with explanation for why.
Student holds attribute(s) firm. Objects used do not sway thinking. These are both sets of 8 even though one set is a different colour or a different object.	I used bears and houses but 5 is five. One half of a chocolate bar and one half of an elephant. Both represents halves.... do not let the object interfere. 75 % is three quarters of something, does not matter what the something is... The difficulty here is that when we are just talking number, objects can interfere. When we quantify with weight or length as in 3 cm or 5 gm... now it is a clearer image for many. Thirds can be cut into sixths so two thirds is now four sixths.	Students identify equality based on same number of things. Students replace the stuff with numbers and then confidently manipulate those numbers Recognize that when two sets (collections) contain the same amount or quantity they are equal or balanced regardless of the arrangement or composition, colour, shape of the collection or set.
Student uses appropriate language correctly: equal, not equal, more, less, equivalent, commutative, equality, inequality, equal sign, greater than, less than, same amount Student records the appropriate statement of equality or inequality	Do not introduce symbols without purpose.. The greater than , less than symbols cause great confusion when students do not experience enough with contexts and materials. The equal sign always means equal.... The convention we follow: one equal sign per equation, but we make	These are acceptable equations about equal: 5 = 5 (there does not have to be an operation sign) 2 + 3 = 5 5 = 2 + 3 2 + 3 = 3 + 2 1 + 4 = 2 + 3 Student identifies sets that are equal

	exceptions when we are stringing equivalencies. 3+7=8+2=10 is true across both equal signs 3+7 = 10+4 = 14 is not. 6 = 2 + 4 os just as valid as 2 + 4 = 6 (You do not have to turn it around) (Teachers worry that this is confusing and leads students to confusions around subtraction equations. Subtraction is a problem when we only focus on writing equations. When we build subtraction, explain and link the writing of equations to the explanations it is not a problem. This same problem holds true for division when all we focus on is writing equations. Expression 3 + 4 (student might see this in dot collection) Expression 30 + 5 (student might see this in hundred grid) Expression 5 + ? (students might set this up as they interpret a problem) Expression 6b (Grade 5 we start to consider coefficients) Equation: 6 = 4 + 2 or 4 + 2 = 6	and identifies why: contain same amount or share a common measure as in equal weight, equal length, equal capacity or volume. Student creates an equality to match a given equation. Student identifies sets that are not equal with explanation for why.

	7 = 9 – 2 or 9 – 2 = 7 3+5=5+3 8+2 = 7+3 6x4=4x6 6x4=24 or 24=6x4 24 ÷ 4 = 6 or 6 = 24÷ 4 4 + ? = 10 10 – 4 = ? y = 2x + 1 y+5 = x + 2	
Student accepts and applies the term equal to quantifiable comparisons as in equal weights, distances, time, areas, volumes, etc.	As we move to Grade 3 we begin to introduce units of measure. Units of measure are related. 10 mm = 1 cm 100cm= 1m Place Value units are equivalent: 10 tens = 100 10 hundreds = 1000 Fractional Units and Decimal Fraction Units are embedded Thirds are in sixths hundredths are in tenths	Students recognize that changing units does not change the value of the measurement. Ex. Changing 1 km to 1000 m does not make it longer or shorter.
Student is able to preserve equality between 2 sets. (Students recognize that equality is a relationship that can	Students recognize that you can maintain equality by adding, subtracting, multiplying and dividing	Students identify equality based on same number of things. Students replace the stuff with numbers

be conserved.)	both sides by the same amount.	and then confidently manipulate those numbers
Student is able to transform inequality to create equality multiple ways and can explain the difference between those ways and record equations to describe Addition and Multiplication Student is able to use multiple ways to transform an equality into an equivalent equality for both addition and multiplication.	Liping Ma *"Changing one or both sides of an equal sign for certain purposes while preserving the "equals" relationship is the secret of mathematical operations*". Students demonstrate flexibility in number sense. Students can apply the big ideas of equality to facilitate the learning of basic facts	Liping Ma "Changing one or both sides of an equal sign for certain purposes while preserving the "equals" relationship is the secret of mathematical operations". Array for multiplication: • 8 x 3 = 3 x 8(commutative) • 3 x 8 = (1 x 8)+(2 x 8)(decomposing)(distributive) • 3 x 8 = 6 x 4(double and half) • If 5 + 5 = 10 then 6 + 4 = 10(rearranging does not change equivalence) • If 5 + 5 = 10 then 5 + 6 = 11(preservation of equality)