



Indiana Academic Standards for Mathematics – Second Grade
Adopted April 2014 – Standards Resource Guide Document

This Teacher Resource Guide has been developed to provide supporting materials to help educators successfully implement the Indiana Academic Standards for Second Grade Mathematics- Adopted April 2014. These resources are provided to help you in your work to ensure all students meet the rigorous learning expectations set by the Academic Standards. Use of these resources is optional-teachers should decide which resource will work best in their school for their students.

The Indiana Department of Education would like to thank Pam Breedlove, Johanna Huls, Ben Kemp, Jim Mirabelli and Rhonoda Van Winkle for their contributions to this document.

This Resource Guide will be updated as necessary.

The examples in this document are for illustrative purposes only, to promote a base of clarity and common understanding. *Each example illustrates a standard but please note that examples are not intended to limit interpretation or classroom applications of the standards.*

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GOOD WEBSITES FOR MATHEMATICS:

<http://nlvm.usu.edu/en/nav/vlibrary.html>

<http://www.math.hope.edu/swanson/methods/applets.html>

<http://learnzillion.com>

<http://illuminations.nctm.org>

<https://teacher.desmos.com>

<http://illustrativemathematics.org>

<http://www.insidemathematics.org>

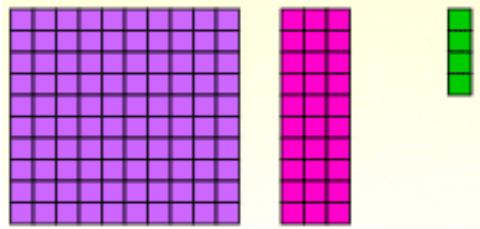
<https://www.khanacademy.org/>

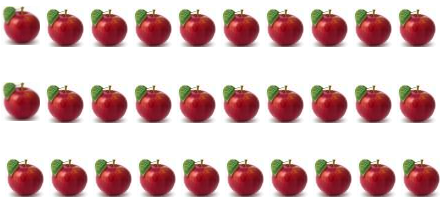
<https://www.teachingchannel.org/>

<http://map.mathshell.org/materials/index.php>

<https://www.istemnetwork.org/index.cfm>

<http://www.azed.gov/azccrs/mathstandards/>

	Indiana Academic Standard for Mathematics Second Grade – Adopted April 2014	Highlighted Vocabulary Words from the Standard Defined	Specific Second Grade Example for the Standard	Specific Second Grade Electronic Resource for the Standard
Number Sense				
MA.2.NS.1	Count by ones, twos, fives, tens, and hundreds up to at least 1,000 from any given number.		a) Count forward by 2 from 36. 36, _____, _____, _____ b) Count forward by 100 from 50. 50, _____, _____, _____	http://mrnussbaum.com/number-chart/
MA.2.NS.2	Read and write whole numbers up to 1,000. Use words , models , standard form and expanded form to represent and show equivalent forms of whole numbers up to 1,000.	Whole numbers - the set of numbers 0, 1, 2, 3, 4, 5, etc. Word form - a number written in words Models - a picture representation of the number Standard form - a number written in a way that shows only its digits Expanded form - a number written as the sum of the values of its digits Represent - to show or describe Equivalent - having the same or equal value	a) What number does the model below show?  b) Write 365 using words and expanded form.	http://www.k-5mathteachingresources.com/2nd-grade-number-activities.html

MA.2.NS.3	Plot and compare whole numbers up to 1,000 on a number line .	Plot - to draw on a number line, graph or map Number line - a straight line on which there is indicated a one-to-one correspondence between points on the line and the set of real numbers.	a) Plot the numbers below on a number line. 380, 378, 382 b) Which number is greater, 501 or 499? Plot these numbers on a number line.	https://learnzillion.com/lessons/2315
MA.2.NS.4	Match the ordinal numbers first, second, third, etc., with an ordered set up to 30 items.	Ordinal numbers - a number that tells the position of something in a list Ordered set - a group of objects or items placed in a specific arrangement	Put an X on the seventeenth apple and circle the twenty-eighth apple. 	http://www.noodle.org/learn/details/89207/ordinal-numbers
MA.2.NS.5	Determine whether a group of objects (up to 20) has an odd or even number of members (e.g., by placing that number of objects in two groups of the same size and recognizing that for even numbers no object will be left over and for odd numbers one object will be left over, or by pairing objects or counting them by 2s).	Odd - any integer that cannot be divided exactly by 2. The last digit will be 1, 3, 5, 7 or 9. Even - any integer that can be divided exactly by 2. The last digit will be 0, 2, 4, 6 or 8	a) Meg says there is an odd number of "X" marks below. Is Meg correct? Explain your answer. X X X X X X X X X X X X X X b) Sarah has 7 marbles. She puts them in groups of 2. Draw a picture to represent this situation. Does Sarah have an odd or even number of marbles? Explain how you know.	http://www.k-5mathteachingresources.com/support-files/evenoddpatternblockgrab.pdf


MA.2.NS.6	Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones (e.g., 706 equals 7 hundreds, 0 tens, and 6 ones). Understand that 100 can be thought of as a group of ten tens — called a “hundred.” Understand that the numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).	Digit - a symbol used to make numerals. 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 are the ten digits we use in everyday numbers.	<p>a) Complete the table below to show the number of hundreds, tens, and ones in 300.</p> <table border="1" data-bbox="1073 461 1703 537"> <thead> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>b) Complete the table below to show the number of hundreds, tens, and ones in 478.</p> <table border="1" data-bbox="1073 678 1703 755"> <thead> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Hundreds	Tens	Ones				Hundreds	Tens	Ones				http://www.k-5mathteachingresources.com/support-files/make-it-four-ways.pdf
Hundreds	Tens	Ones														
Hundreds	Tens	Ones														
MA.2.NS.7	Use place value understanding to compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons.	Place value - the value of the place, or position, of a digit in a number	<p>a) Use $<$, $>$, or $=$ to make the number sentence true.</p> <p style="text-align: center;">234 _____ 324</p> <p>b) Circle the TWO number sentences that are true.</p> <p style="text-align: center;">763 > 727 328 < 330</p> <p style="text-align: center;">412 = 421 779 < 779</p> <p style="text-align: center;">785 > 787 508 < 499</p>	http://www.k-5mathteachingresources.com/support-files/placevaluechallenge3digits.pdf												




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Computation and Algebraic Thinking

MA.2.CA.1	Add and subtract fluently within 100.	Fluently - efficient and accurate	Solve each problem. $28 + 64$ $97 - 46$ $34 - 18$ $88 + 9$ $70 - 36$ $61 + 12$ $65 - 29$ $49 + 19$	http://www.k-5mathteachingresources.com/support-files/subtraction-strategy-counting-up.pdf
MA.2.CA.2	Solve real-world problems involving addition and subtraction within 100 in situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all parts of the addition or subtraction problem (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem). Use estimation to decide whether answers are reasonable in addition problems.	Equation - an equation says that two things are the same, using mathematical symbols. An equal sign (=) is used. Symbol - A pattern or image; not words Estimate - A close guess of the actual value, usually with some thought or calculation involved. Reasonable - fair and sensible	a) Erin donated 24 picture books to the library. Now the library has a total of 72 picture books. How many picture books did the library have before the donation? * See Table 1 on the last page of this document. Table 1 is copied from the CCSS and contains common addition and subtraction situations. These types of situations can be used to create tasks using numbers within 100.	http://illuminations.nctm.org/Activity.aspx?id=3526

MA.2.CA.3	Solve real-world problems involving addition and subtraction within 100 in situations involving lengths that are given in the same units (e.g., by using drawings, such as drawings of rulers, and equations with a symbol for the unknown number to represent the problem).	<p>Length- distance from one end of something to the other end</p> <p>Unit - a particular amount of length, time, money, etc., that is used as a standard for counting or measuring</p> <p>Equation - An equation says that two things are the same, using mathematical symbols. An equal sign (=) is used</p> <p>Symbol - A pattern or image used instead of words</p>	<p>Ray measured his pencil as shown below. Sue's pencil is 1 centimeter longer than Ray's pencil. Ray and Sue put their pencils tip-to-tip in a straight line. How long are the two pencils combined?</p> 	<p>https://learnzillion.com/lessons/2347-compare-the-length-of-objects</p>
MA.2.CA.4	Add and subtract within 1000, using models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; describe the strategy and explain the reasoning used. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones, and that sometimes it is necessary to compose or decompose tens or hundreds.	<p>Compose - to create numbers by putting together smaller parts</p> <p>Decompose - the process of separating numbers into smaller components</p>	<p>Solve each problem. Show your work and explain how you found your answers.</p> <p style="text-align: center;"> $358 + 276$ $508 + 122$ $768 - 341$ $602 - 157$ </p>	<p>http://www.gregtangmath.com/play.php?game=stdalgorithms</p>

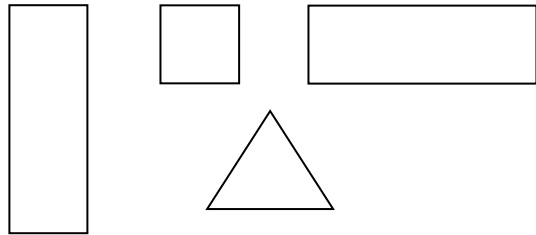
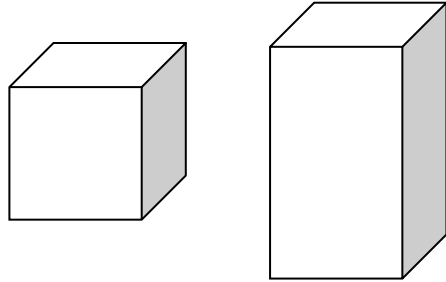
<p>MA.2.CA.5</p>	<p>Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal groups.</p>	<p>Arrays- a way of displaying objects in rows and columns Sum - the result of adding two or more numbers</p>	<p>Julie has a box of chocolates as shown below. She will eat one row of chocolates each day. Write an addition sentence to show the number of chocolates Julie will eat altogether in four days.</p> 	<p>http://www.k-5mathteachingresources.com/support-files/building-arrays.pdf</p>
<p>MA.2.CA.6</p>	<p>Show that the order in which two numbers are added (commutative property) and how the numbers are grouped in addition (associative property) will not change the sum. These properties can be used to show that numbers can be added in any order.</p>	<p>Commutative property of addition- the property that allows one to change the location of the addends while retaining the same sum; $a + b = b + a$ Associative property of addition - the property that allows one to group the addends in any order while retaining the same sum; $(a + b) + c = a + (b + c)$</p>	<p>a) Devonne says, “You should always add two numbers in order from left to right. So if the problem is $25 + 30$, you must do $25 + 30$ and NOT $30 + 25$.” Is Devonne correct? Show two different examples that either show Devonne is correct or not correct.</p> <p>b) Solve the problem below. Then, make two new problems using the same numbers and addition signs, but with the parentheses placed around two different numbers. Solve the problems you created and describe how all three answers compare.</p> <p style="text-align: center;">$(1 + 2) + 3 + 4$</p>	<p>http://mrnussbaum.com/grade_2_standardsfam2/</p>

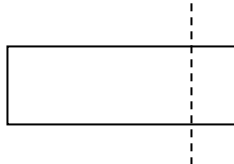



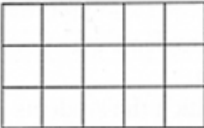
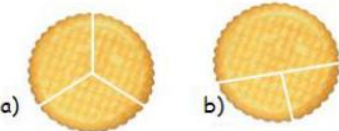
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MA.2.CA.7	Create, extend , and give an appropriate rule for number patterns using addition and subtraction within 1000.	<p>Extend - to continue in a specified direction</p> <p>Rule - the procedure that a count must follow</p>	<p>a) What are the next two numbers in the pattern below? Describe the rule for this pattern.</p> <p style="text-align: center;">110, 210, 310, ____, ____</p> <p>b) What are the next two numbers in the pattern below? Describe the rule for this pattern.</p> <p style="text-align: center;">500, 490, 480, ____, ____</p> <p>c) Activity: Have students create their own number pattern. Then, have them switch patterns with another student and try to determine each other's rule.</p>	<p>http://illuminations.nctm.org/Lesson.aspx?id=597</p>
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Geometry

<p>MA.2.G.1</p>	<p>Identify, describe, and classify two- and three-dimensional shapes (triangle, square, rectangle, cube, right rectangular prism) according to the number and shape of faces and the number of sides and/or vertices. Draw two-dimensional shapes.</p>	<p>Face - any of the individual surfaces of a solid object. Side - one of the lines that make a flat (2-dimensional) shape. Or one of the surfaces that make a solid (3-dimensional) object. Vertex - point where two or more straight lines meet. A corner. The plural of vertex is "vertices".</p>	<p>a) Describe how the shapes are similar and different.</p>  <p>b) Draw a square and rectangle and describe how they are different.</p> <p>c) Describe how the figures are similar and different.</p> 	<p>http://illuminations.nctm.org/Activity.aspx?id=3521</p>
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MA.2.G.2	Create squares, rectangles, triangles, cubes , and right rectangular prisms using appropriate materials.	<p>Cube - a box-shaped solid object that has six identical square faces</p> <p>Right Rectangular Prism - a prism that has two bases, one directly above the other, and that has its lateral faces as rectangles. In a right prism, the edges of the lateral faces are perpendicular to the bases.</p>		http://illuminations.nctm.org/Activity.aspx?id=3587
MA.2.G.3	Investigate and predict the result of composing and decomposing two- and three-dimensional shapes.	<p>Investigate - to try to get information about</p> <p>Predict - to say that (something) will or might happen in the future</p>	<p>a) John drew a dotted line on the rectangle below as shown. What two shapes will you have if you cut along the dotted line?</p>  <p>Now draw another rectangle. Place a dotted line on your new rectangle to show how it can be split into two triangles.</p> <p>b) What shape can you make if you put the two triangles together to make one shape?</p> 	http://illuminations.nctm.org/Activity.aspx?id=4206

MA.2.G.4	Partition a rectangle into rows and columns of same-size (unit) squares and count to find the total number of same-size squares.	Partition - to divide into parts or shares	<p>a) How many small squares are in the rectangle?</p>  <p>b) Draw a rectangle that has 5 rows and 2 columns. How many squares are in your rectangle?</p>	https://learnzillion.com/lessons?utf8=%E2%9C%93&filters[subject]=math&query=2.g.2&commit=Search+lessons
MA.2.G.5	Partition circles and rectangles into two, three, or four equal parts; describe the shares using the words halves, thirds, half of, a third of, etc.; and describe the whole as two halves , three thirds , four fourths . Recognize that equal parts of identical wholes need not have the same shape.	<p>Halves- one of two equal parts of a whole</p> <p>Thirds- one of three equal parts of a whole</p> <p>Fourths -one of four equal parts of a whole</p> <p>Identical Wholes - wholes that are the same size and shape</p>	<p>a) Explain why picture “a” shows a circle divided into thirds and picture “b” does not. How many thirds are in picture “a”?</p>  <p>b) Draw a rectangle and divide it into 4 equal parts. How many fourths are in your picture?</p>	https://learnzillion.com/lessons/3579-partition-a-circle-into-equal-shares
Measurement				
MA.2.M.1	Describe the relationships among inch, foot, and yard. Describe the relationship between centimeter and meter.		<p>a) Would you rather have a chocolate bar that is 2 inches long, 2 feet long, or 2 yards long? Explain your answer.</p> <p>b) Would you rather do a row of math problems that measures 10 centimeters long or 1 meter long? Explain your answer.</p>	https://learnzillion.com/lessons/2571-compare-and-convert-metric-units-of-length

MA.2.M.2	Estimate and measure the length of an object by selecting and using appropriate tools, such as rulers, yardsticks, meter sticks, and measuring tapes to the nearest inch, foot, yard, centimeter and meter.	Estimate - a close guess of the actual value, usually with some thought or calculation involved Measure - to find a number that shows the size or amount of something usually in reference to a standard measurement, such as a meter	<p>a) Match the tool on the left with what it would be used to measure on the right.</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">1. Meter Stick</td> <td style="width: 50%;">A. Length of a pool</td> </tr> <tr> <td>2. Ruler</td> <td>B. Height of a desk</td> </tr> <tr> <td>3. Tape measure</td> <td>C. Marker</td> </tr> </table> <p>b) What is the length of the line segment below to the nearest inch? to the nearest centimeter?</p> <p style="text-align: center;">_____</p>	1. Meter Stick	A. Length of a pool	2. Ruler	B. Height of a desk	3. Tape measure	C. Marker	http://www.ixl.com/math/grade-2/which-customary-unit-of-length-is-appropriate
1. Meter Stick	A. Length of a pool									
2. Ruler	B. Height of a desk									
3. Tape measure	C. Marker									
MA.2.M.3	Understand that the length of an object does not change regardless of the units used. Measure the length of an object twice using length units of different lengths for the two measurements. Describe how the two measurements relate to the size of the unit chosen.		<p>a) What is the length of the line segment below to the nearest inch? to the nearest centimeter? Describe why the numbers for your two measurements are different.</p> <p style="text-align: center;">_____</p> <p>b) Joe says, “My doctor said that I am 48 inches tall.”</p> <p>Raul says, “My doctor said that I am 4 feet tall. 4 is smaller than 48, and Joe and I are the same height. One of our doctors must be wrong.”</p> <p>Describe why Raul’s thinking is not correct.</p>	http://illuminations.net.org/Lesson.aspx?id=697						
MA.2.M.4	Estimate and measure volume (capacity) using cups and pints.	Volume - the amount of 3-dimensional space an object occupies; capacity	Mrs. Jackson’s class is going on a picnic. About how many cups of fruit punch should she bring for her 20 students? Explain your answer.	http://www.ixl.com/math/grade-2/which-customary-unit-of-volume-is-appropriate						
MA.2.M.5	Tell and write time to the nearest five minutes from	Analog clock - includes an hour hand (short) and a minute hand	a) Jason went to his friend’s house at 4:30 p.m. His mom told him that he needed to be home in 30	http://www.k-5mathteachingresources.com						



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	analog clocks , using a.m. and p.m. Solve real-world problems involving addition and subtraction of time intervals on the hour or half hour.	(long) to represent the time	minutes. What time should Jason be home? b) Tina played outside for 3 hours. When Tina came inside from playing outdoors, the time was 11:00 a.m. At what time did Tina start playing outside?	es.com/support-files/onehourearlieronehourlater.pdf
MA.2.M.6	Describe relationships of time, including: seconds in a minute; minutes in an hour; hours in a day; days in a week; and days, weeks, and months in a year.		a) Would you rather go on a fun trip for 9 days or 2 weeks? Explain your answer. b) Would you rather be “grounded” for 1 year or 14 months? Explain your answer.	http://www.ixl.com/standards/indiana/math/grade-2?documentId=1092
MA.2.M.7	Find the value of a collection of pennies, nickels, dimes, quarters and dollars.	Value - how much something is worth	Bill says, “I have some coins that total 30¢. What coins do I have?” Describe different sets of coins that Bill might have.	http://illuminations.net.org/coinbox/

Data Analysis

<p>MA.2.DA.1</p>	<p>Draw a picture graph (with single-unit scale) and a bar graph (with single-unit scale) to represent a data set with up to four choices (What is your favorite color? red, blue, yellow, green). Solve simple put-together, take-apart, and compare problems using information presented in the graphs.</p>	<p>Picture Graph - a graph that uses symbols to represent data Bar Graph - a graph that uses rectangular bars to represent data; the bars can be horizontal or vertical Data Set - a collection of facts, such as values or measurements</p>	<p>Mel’s class used a survey to find out everyone’s favorite pizza topping. The results of the survey are shown in the table below.</p> <p style="text-align: center;">Favorite Topping</p> <table border="1" data-bbox="974 602 1383 789"> <thead> <tr> <th>Topping</th> <th>Number of People</th> </tr> </thead> <tbody> <tr> <td>Mushroom</td> <td>3</td> </tr> <tr> <td>Pepperoni</td> <td>9</td> </tr> <tr> <td>Sausage</td> <td>6</td> </tr> <tr> <td>Cheese</td> <td>10</td> </tr> </tbody> </table> <ul style="list-style-type: none"> • Create a bar graph to represent this data. • How many students took part in the survey? • How many students favorite topping is either mushroom or pepperoni? • How many more students like cheese than sausage? 	Topping	Number of People	Mushroom	3	Pepperoni	9	Sausage	6	Cheese	10	<p>https://learnzillion.com/lessons/3274-compare-picture-graphs-and-bar-graphs</p>
Topping	Number of People													
Mushroom	3													
Pepperoni	9													
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TABLE 1. Common addition and subtraction situations.⁶

	Result Unknown	Change Unknown	Start Unknown
Add to	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? $2 + 3 = ?$	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two? $2 + ? = 5$	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before? $? + 3 = 5$
Take from	Five apples were on the table. I ate two apples. How many apples are on the table now? $5 - 2 = ?$	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat? $5 - ? = 3$	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before? $? - 2 = 3$
	Total Unknown	Addend Unknown	Both Addends Unknown ¹
Put Together/ Take Apart²	Three red apples and two green apples are on the table. How many apples are on the table? $3 + 2 = ?$	Five apples are on the table. Three are red and the rest are green. How many apples are green? $3 + ? = 5, 5 - 3 = ?$	Grandma has five flowers. How many can she put in her red vase and how many in her blue vase? $5 = 0 + 5, 5 = 5 + 0$ $5 = 1 + 4, 5 = 4 + 1$ $5 = 2 + 3, 5 = 3 + 2$
	Difference Unknown	Bigger Unknown	Smaller Unknown
Compare³	("How many more?" version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy? ("How many fewer?" version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie? $2 + ? = 5, 5 - 2 = ?$	(Version with "more"): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? (Version with "fewer"): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? $2 + 3 = ?, 3 + 2 = ?$	(Version with "more"): Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have? (Version with "fewer"): Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have? $5 - 3 = ?, ? + 3 = 5$

¹These take apart situations can be used to show all the decompositions of a given number. The associated equations, which have the total on the left of the equal sign, help children understand that the = sign does not always mean makes or results in but always does mean is the same number as.

²Either addend can be unknown, so there are three variations of these problem situations. Both Addends Unknown is a productive extension of this basic situation, especially for small numbers less than or equal to 10.