

COG: MATH 3: Number Sense of Math Operations

Child shows increasing ability to add and subtract small quantities of objects

HANDOUT 8

Mathematics Reasoning Measures

Mark the latest developmental level the child has mastered:

Building			Integrating		
Earlier	Middle	Later	Earlier	Middle	Later
<p>Attends to or explores changes in numbers of objects</p>	<p>Identifies the new number of objects after one object is added to or removed from a set of two or three objects</p>	<p>Uses counting to add or subtract one or two objects to or from a group of at least four objects</p>	<p>Solves simple addition or subtraction word problems by using fingers or objects to represent numbers or by mental calculation</p>	<p>Represents and solves addition and subtraction problems with totals up to 10, by using objects, drawings, or fingers, or by mental calculation; <i>and</i> Demonstrate understanding that numbers (ten or smaller) can be decomposed in more than one way (i.e., $7=5+2$; $7=6+1$)</p>	<p>Represents and solves addition and subtraction word problems with totals up to 20, by using objects, drawings and equations, applying advanced strategies (e.g., count-on), including strategies that reflect understanding of properties of addition and subtraction</p>
<p>Examples</p> <ul style="list-style-type: none"> Communicates, "Now we have more," when an adult combines markers from the shelf with some on the table. Communicates, "They're almost gone," after taking the next-to-last unit block out of the basket. Notifies when another child's bowl has more beads than own bowl, and asks an adult to add beads to own bowl. 	<ul style="list-style-type: none"> Communicates, "Now we have three," when adding a third snail to the two collected from the yard. Communicates, "Only two left," when an adult removes a torn bean bag from a group of three bean bags. Gives one of two cars to another child, and then communicates, "I have one and you have one." 	<ul style="list-style-type: none"> Adds one counting bear to a group of four, and counts, "I have one . . . two . . . three . . . four . . . five." Removes two of seven ducks from a flannel board and counts the remaining ducks, and then communicates that there are five left. Adds two cars to a train with four cars, counts the number of cars, and communicates that there are now six cars. Watches an adult add two markers to a group of four markers, counts the total number, and communicates that there are six. 	<ul style="list-style-type: none"> Communicates, "I had four hair clips, but I gave one to my sister. Now I have three." Brings six papers to the table after adult communicates, "We usually have four children, but today we have two visitors, so how many papers do we need altogether?" Holds up five fingers and then one finger, counts them, and communicates, "Six," when asked, "If you had five crackers, and you took one more, how many crackers would you have?" 	<ul style="list-style-type: none"> Holds up five fingers on one hand and three fingers on the other hand and counts to self, "1, 2, 3, 4, 5, 6, 7, 8," when presented with a word problem about how many balloons you would have if you were given five balloons and then three more balloons. Solves the problem: "7 + 2," presented on a worksheet by drawing seven circles, then drawing two more circles, and counting the total number of circles. Removes three cars and counts the number of cars left. "1, 2, 3, 4, 5, 6, 7," and replies "7" when adult asks, "You have 10 cars. If I took 3 away, how many would you have left?" Creates a group of three manipulatives and a group of five manipulatives and communicates, "I have eight. I can also do four and four and still have eight." 	<ul style="list-style-type: none"> Writes the equation "11 + 3," then counts aloud, "11, 12, 13, 14," and replies "14," when presented with a word problem about a child who has 11 balloons and gets three more balloons. (count-on strategy) Communicates, "12 minus 2 is 10, and then 10 minus 1 is 9," when explaining her solution to the problem: "12 minus 3." (make a 10 strategy) Communicates, "8 plus 2 is 10, so it is two," when presented with the subtraction problem: "10 minus 8." (subtraction is inverse to addition strategy) Communicates, "7 plus 3 is 10 and then 2 more is . . . 10, 11, 12. There are 12," when solving the equation: "7 plus 2 plus 3." (make a 10 and count-on strategies)

- Child is emerging to the next developmental level
- If you are unable to rate this measure, explain here:

Number Sense of Math Operations

COG: MATH 3 (of 6)