

# Math Perspectives Teacher Development Center

## AMC ASSESSMENTS AND THE CRITICAL LEARNING PHASES FOR NUMBERS TO 100

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The Critical Learning Phase that a child has reached determines the way he or she is able to think with and use numbers to solve problems.

COUNTING	COMPARING
<p><b>1. COUNTING OBJECTS</b></p> <ul style="list-style-type: none"> <li>Counts one item for each number (one-to-one correspondence)</li> <li>Keeps track of an unorganized pile</li> <li>Notices when recounting a group results in a different number</li> <li>Is bothered when counting a group results in the same number after some have been added or taken away</li> <li>Spontaneously checks by recounting to see if the result is the same</li> <li>Knows “how many” after counting</li> <li>Reacts to estimate while counting</li> <li>Counts out a particular quantity</li> </ul>	<p><b>2. CHANGING NUMBERS</b></p> <p><b>Changing One Number to Another</b></p> <ul style="list-style-type: none"> <li>Changes a number to a larger number by counting on, or adding on a group</li> <li>Changes a number to a smaller number by counting back, or removing a group</li> <li>Describing the Relationship between the Numbers</li> <li>After changing one number to another, is aware of how many were added or taken away</li> <li>Knows how many to add or take away from a number to make another number</li> </ul>
<p><b>One More/One Less</b></p> <ul style="list-style-type: none"> <li>Knows “one more” in sequence without counting</li> <li>Knows “one less” in sequence without counting</li> <li>Notices if a counting pattern doesn’t make sense (Ex: saying, 20, 30, 40 instead of 21, 22, 23, or 13, 14, 15 instead of 13, 12, 11)</li> <li>Knows one more without counting when numbers are presented out of sequence</li> <li>Knows one less without counting when numbers are presented out of sequence</li> </ul>	<p><b>3. MORE/LESS TRAINS</b></p> <p><b>Compares Two Groups: Lined Up</b></p> <ul style="list-style-type: none"> <li>Uses what is known about one number to determine another when the groups are lined up</li> <li>Compares two groups that are lined up and determines which is more, and which is less</li> <li>When the groups are lined up, tells how many more or less, when the difference is 1 or 2</li> <li>When the groups are lined up, tells how many more or less, when the difference is more than 2</li> </ul>
<p><b>Counting Objects by Groups</b></p> <ul style="list-style-type: none"> <li>Counts by groups by moving the appropriate group of objects</li> <li>Knows quantity stays the same when counting by a different group</li> </ul>	<p><b>Compares Two Groups: Not Lined Up</b></p> <ul style="list-style-type: none"> <li>Compares two groups that are not lined up and tells which is more, and which is less</li> <li>When the groups are not lined up, tells how many more or less, when the difference is 1 or 2</li> <li>When the groups are not lined up, tells how many more or less, when the difference is more than 2</li> </ul>

## NUMBER COMPOSITION and DECOMPOSITION to 10

### 4. NUMBER ARRANGEMENTS

- Recognizes groups of numbers to 5 in a variety of configurations
- Recognizes and describes parts contained in larger numbers
- Describes parts of numbers; counts on to determine total
- Combines parts by using related combinations including:
  - Knowledge of commutative property (Ex:  $6 + 3 = 3 + 6$ )
  - Rearranging parts to create known combinations (Ex: adding  $6 + 4$  by moving 1 from the 6 to the 4, making  $5 + 5$ )

### 5. COMBINATION TRAINS

- Combines parts by using related combinations including doubles plus or minus 1
- Knows totals when combining parts

### 6. HIDING ASSESSMENT

- Identifies missing parts of numbers to 10 by using related combinations including:
  - Using number combinations to solve subtraction (Ex:  $5 + 3 = 8$ , so  $8 - 5 = 3$ )
  - Knowing taking away 1 part leaves the other part (Ex:  $6 - 4 = 2$ , so  $6 - 2 = 4$ )
- Knows missing parts of numbers to 10

**PLACE VALUE: NUMBERS as TENS and ONES**

**7. TEN FRAMES**

- Counts ten as a single unit
- Combines 1 ten with any number of ones up to 9 without counting
- Decomposes numbers from 10 to 19 into 1 ten and some ones
- Adds 10 to any number of ones to 9, without counting
- Adds 2 single-digit numbers with sums larger than ten by reorganizing them into one ten and leftovers
- When adding 2 single-digit numbers that result in a ten and some ones, knows what part of the number is needed to make a ten, and what part will be left over
- Subtracts 10 from any number from 11-20, without counting
- When subtracting single-digit numbers, knows what part of the number needs to be taken away to get to ten, and what is still left to take away
- Subtracts from numbers to 19 by breaking up the ten when necessary, and knows how many left without counting

**8. GROUPING TENS**

- Counts groups of ten
- Knows total instantly when the number of tens and ones is known
- Knows the number of tens that can be made from any group of ones and the number of ones left over
- Knows the number of tens in any two-digit number
- Knows ten more for any two-digit number
- Knows ten less for any two-digit number

**9. TWO-DIGIT ADDITION and SUBTRACTION**

**Adding Numbers to 100**

- Adds 2 numbers up to 100 by reorganizing them into tens and left over ones
- Subtracts from numbers to 100 by breaking apart tens when necessary, and reorganizing what is left into the remaining tens and leftovers