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.

<table>
<tr><th>COUNTING</th><th>COMPARING</th></tr>
<tr><td>1. COUNTING OBJECTS
Counts one item for each number (one-to-one correspondence)
Keeps track of an unorganized pile
Notices when recounting a group results in a different number
Is bothered when counting a group results in the same number after some have been added or taken away
Spontaneously checks by recounting to see if the result is the same
Knows “how many” after counting
Reacts to estimate while counting
Counts out a particular quantity</td><td>2. CHANGING NUMBERS
Changing One Number to Another
Changes a number to a larger number by counting on, or adding on a group
Changes a number to a smaller number by counting back, or removing a group
Describing the Relationship between the Numbers
After changing one number to another, is aware of how many were added or taken away
Knows how many to add or take away from a number to make another number</td></tr>
<tr><td>One More/One Less
Knows “one more” in sequence without counting
Knows “one less” in sequence without counting
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)
Knows one more without counting when numbers are presented out of sequence
Knows one less without counting when numbers are presented out of sequence</td><td rowspan="2">3. MORE/LESS TRAINS
Compares Two Groups: Lined Up
Uses what is known about one number to determine another when the groups are lined up
Compares two groups that are lined up and determines which is more, and which is less
When the groups are lined up, tells how many more or less, when the difference is 1 or 2
When the groups are lined up, tells how many more or less, when the difference is more than 2
Compares Two Groups: Not Lined Up
Compares two groups that are not lined up and tells which is more, and which is less
When the groups are not lined up, tells how may more or less, when the difference is 1 or 2
When the groups are not lined up, tells how many more or less, when the difference is more than 2</td></tr>
<tr><td>Counting Objects by Groups
Counts by groups by moving the appropriate group of objects
Knows quantity stays the same when counting by a different group</td></tr>
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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