Strategy Levels for CGI Problem Types

Addition and Subtraction Strategies for Single-Digit Numbers

(see p. 31 in *Children's Mathematics*)
(see chapter 3 in *Children's Mathematics* for narrative description)

Direct Modeling	• represents all quantities • follows action or situation of the story
Counting	• conserves one number in his/her head • counts on or back by ONES
Derived Facts and/or Recalled Facts	• uses an add. /sub. fact they know to solve one they don't know (derived fact) • knows add. /sub. fact from memory (recalled fact)
Flexible Strategies (this can be evident in any of the above three stages)	strategy does not match action or situation of the problem

Multiplication and Division Strategies for Single-Digit Numbers

(see pages 34-44 in *Children's Mathematics*)
(see chapter 4 in *Children's Mathematics* for narrative description)

Direct Modeling	• represents all quantities • follows action or situation of the story
Counting	• SKIP counts • repeated addition/ subtraction
Derived Facts and/or Recalled Facts	• uses a mult. or division fact they know to solve one they don't know (derived fact) • knows mult. or division fact from memory (recalled fact)
Flexible Strategies (this can be evident in any of the above three stages)	strategy does not match action or situation of the problem

Addition and Subtraction Strategies for Multi-Digit Numbers

(see p. 74 in *Children's Mathematics*)
(see chapter 6 in *Children's Mathematics* for narrative description)

Direct Modeling by 1's	• represents each quantity as a collection of single units • follows action or situation of the story
Direct Modeling by 10's	• represents each quantity, uses at least some groups of tens to represent quantities
Counting	• conserves one number in his/her head • counts on or back by ONES
Invented Algorithms (see pages 70-74 for more detailed information in *Children's Mathematics*)	• Incrementing strategy • Combining like units strategy • Compensating Strategy
Flexible Strategies (this can be evident in any of the above four stages)	strategy does not match action or situation of the problem

Multiplication and Division Strategies for problems with Groups of 10 or 100

(see p. 64 in *Children's Mathematics*)
(see chapter 6 in *Children's Mathematics* for narrative description)

Counting by 1's	• counts every unit by ones
Counting by 10's	• use collections of tens when counting – either direct modeling or skip counting
Direct Place Value	• knows how many tens are in a number • knows how much multiple groups of tens will be *For example:* "54. 5 tens is 50 and 4 more is 54"

Carpenter, Thomas P., Fennema, E., Franke, M., Levi, L., Empson, S. (1999). *Children's Mathematics: Cognitively Guided Instruction*. Portsmouth, NH: Heinemann.

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