Number Sense Routines that Support the CGI

Cotsen

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Jan. 13, 2015
What does Cognitively Guided Instruction (CGI) Look Like?

- Problem solving is the focus of instruction; teachers pose a variety of problems.
- Many problem-solving strategies are used to solve problems. Children decide how they should solve each problem.
- Children communicate to their teachers and peers how they solve the problems.
- Teachers understand children’s problem-solving strategies and use that knowledge to plan instruction.
A Typical Day in Downey (TK-5)

- Routine
  - 5 to 15 minutes

- Daily Lesson
  - 30 to 35 minutes

- Closure/Debrief
  - 10 to 15 minutes
Number Sense

“Number sense is an awareness and understanding about what numbers are, their relationships, their magnitude, the relative effect of operating on numbers, including the use of mental mathematics and estimation.”

*Number Sense and Operation Sense*

Fennell and Landis (1994)
What is a Routine?

- 5 – 15 minutes during the opening of math time
- Short lesson alongside (but not necessarily directly related to) the ongoing math curriculum
- Provide students with meaningful ongoing practice with:
  - Number Sense
  - Place Value
  - Computational Fluency
  - Properties of Operations
  - Fractions
  - Standards for Mathematical Practice
  - Listening to others’ strategies
Number Sense Routines

• Allows you to fill in the number sense holes that students are not coming in with

• Helps to introduce new strategies in a way that gets students thinking

• Forces students (especially older students) to think outside the standard algorithm

• Helps to emphasize the Standards for Mathematical Practice

• Helps to address the fluency standard
# Three of These Things

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Three of These Things

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Number of the Day

Tell me about 112.
0° \rightarrow 45° \rightarrow 90° \rightarrow 135° \rightarrow 180°

0° \rightarrow \frac{40}{180} = \frac{4}{18} = \frac{2}{9}

180° \rightarrow \frac{140}{180} = \frac{14}{18} = \frac{7}{9}

Acute angles are less than 90°.

Obtuse angles are greater than 90° but less than 180°.
Number of the Day

- Open ended exploration around a given number
  - Can you make the given number in more than one way?
  - How many different numbers can you use to create your number sentence?
  - Can you use more than one operation to create your number sentence?
  - What other kinds of numbers can you use in your equations?
Open Expressions
For each expression below, choose two different values that would make calculations “easy”. Then simplify the expressions.

\[ 4 + \___ + 8 \]

\[ 25 + \___ + 9 \]

\[ 68 + \___ + 107 \]

\[ 4 \times \___ \times 20 \]

\[ 4 \times \___ \times 0.1 \]

\[ 3.98 + \___ + 2.7 \]
Quick Images

How many dots?
True/False
Number Sentences
Number Talks
True/False / Open Number Sentences

\[ 2 \times 7 = s \]
\[ m = 4 \times 7 \]
\[ 4 \times 8 = p \]
\[ k = 3 \times 8 \]
\[ 8 \times 7 = w \]
Thank You!

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References

- Parrish, Sherry. *Number Talks*. Math Solutions, 2010