
Making Sense of Numbers: Helping Students Overcome Difficulties with Number Concept

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What is number sense?

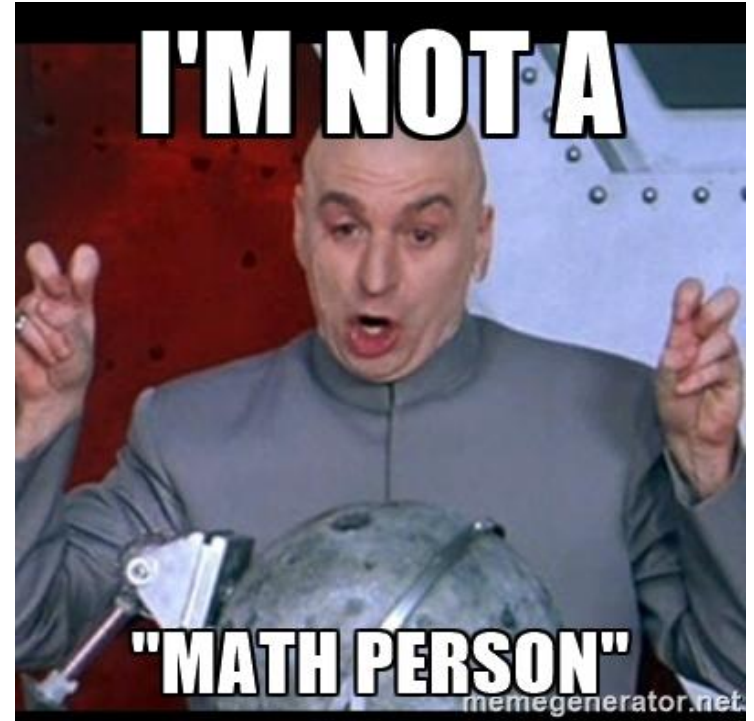
Number sense refers to a student's “**fluidity and flexibility with numbers,**” (Gersten & Chard, 2001). He/She has sense of **what numbers mean**, understands their **relationship to one another**, is able to perform **mental math**, understands **symbolic representations**, and can use those numbers in **real world situations**.

What is number sense?

1. Number Meaning
2. Relationships Between Numbers
3. Number Magnitude
4. Operations Involving Numbers
5. Referents for Numbers/Quantities (referents are words or phrases that denote what something stands for)

Growth Mindset

- Be mindful of how you speak about your own skills
- [Inside Mathematics - SEL and Common Core Math](#)
- [Berkeley - SEL and Common Core](#)
- Get excited about math!



How is it developed?

1. Link school math to real-world experiences
2. Model different computing methods
3. Mental math
4. Discuss strategies
5. Estimate
6. Question students about reasoning
7. Measuring activities

Link Math to Real World Experiences

Present students with situations that relate to both inside and outside classroom experiences. Students need to recognize that numbers are useful for solving problems.

Model Different Computing Methods

Focus on what methods make sense for different situations. There is no one right way to compute. We need our students to be flexible thinkers.

Mental Math

Real life requires mental computation. Students need to be able to move numbers around in their heads and discuss their strategies.

Discuss Strategies

Students must be able to explain their reasoning. This not only will give you insight into how they think, but also will help the children to cement their own ideas and reevaluate them.

Estimate

This should be embedded in problem solving. This is not referring to textbook rounding. Real life estimation is about making sense of a problem and using anchor numbers to base reasoning on.

Question Students About Reasoning Strategies

All the time, not just when they make a mistake. Constantly probing sends several important messages: your ideas are valued, math is about reasoning, and there are always alternative ways to look at a problem.

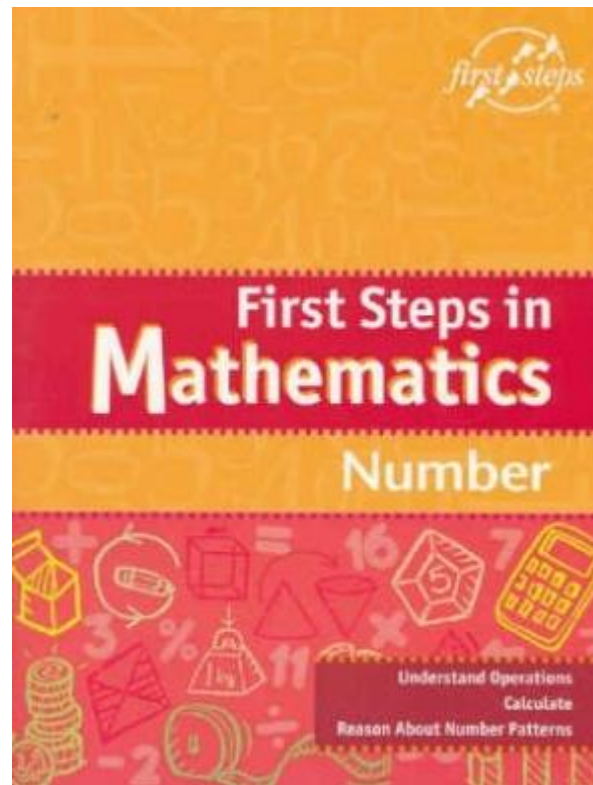
Measuring Activities

When teaching children mathematics, measuring activities should be front and center. Make students verify estimates through doing.

First Steps in Mathematics

AVAILABLE FOR FREE ONLINE:

[First Steps in Mathematics - Number Sense](#)



Key Understanding 1: We Can Count a Collection to Find out how many are in it

ACTIVITIES:

- Birthday claps
- Skip counting money
- Asking - How did you know that this set had more?
- Rearranging, teaching conservation
- Labelling collections/sets

KU2: We can often see how many are in a collection by looking and also by thinking of it in parts

- Subitising
- Early on students can “see” that one, two, or three look different
- Think of a collection in parts- partitioning and decomposing

Activities

- Five Little Monkeys
- Hands Up
- Ten Frames/Playing Cards
- Grid Partitions- 100, 1000

KU3: We can use numbers in ways that do not refer to quantity

Activities:

- Ordered lists
- Pointing out/discussing numbers on sports jersey
- Neighborhood number hunt
- Continuing a count (starting at crucial points like 997) or backwards

KU4: the whole numbers are in a particular order, and there are patterns in the way we say them which help us to remember the order

- Place value system is based on powers of 10- 100= “tentens”, etc

Activities

- Numbers and actions
- Counting sequences- starting from crucial numbers- 98, 192, 996
- Predicting sequence- partner and calculator

KU5: There are patterns in the way we write whole numbers that help us to remember their order

ACTIVITIES:

- Make your own place value kit
- Creating number charts and looking for patterns
- One tenth as much: What pattern do you notice?
- Tens blocks: How many times bigger is 100 than 10? How many times bigger is 1000 than 10?

KU6: Place value helps us to think of the same whole number in different ways, and this can be useful

ACTIVITIES:

- Jigsaw cards- same number, different ways
- Group items by 10's & 1's
- Counting on with MAB materials out of sequence
- Number lines w/different increments- 10's, 100's, etc
- Word problems- different place groupings
- Partitioning numbers for multiplication

KU7: We can extend the patterns in the way we write whole number to write decimals

ACTIVITIES:

- Count by .5 and record on a number line
- Money games
- Writing fractions as decimals

KU8: We can compare and order the numbers themselves

ACTIVITIES:

- Number sequences
- Peg up- whole numbers and decimals
- Biggest number- same digits, different order, (decimals)
- Changing values- calculator
- Ordering numbers in different forms

KU1-7 for Fractions

1. When we split something into two equal sized part we say we have “halved it” and that each part is half of the original
2. We can partition objects and collections into two or more equal sized parts and the partitioning can be done in different ways
3. We used fraction words and symbols to describe parts of a whole; the whole can be an object, collection, or a quantity
4. The same fractional quantity can be represented with a lot of different fractions; we say fractions are equivalent when they represent the same number or quantity

KU1-7 for Fractions

5. We can compare and order fractional numbers and place them on a number line

6. A fractional number can be written as a division or as a decimal

7. A fraction symbol may show a ratio relationship between two quantities; percentages are a special kind of ratio we use to make comparisons easier

A close-up photograph of Gene Wilder from the movie "The Sandlot". He is wearing his signature red blazer, glasses, and a white shirt. He has a slight, knowing smile on his face. The background is dark and out of focus, showing some blurred lights.

**I SEE YOU'RE DOING YOUR MATH
HOMEWORK IN PEN**

I TOO LIKE TO LIVE DANGEROUSLY

That moment when you
understand something
in math class:



I AM THE SMARTEST MAN ALIVE!