Putting the Components of Number Sense into Action with the Help of AI

Identifying components of number sense can be difficult. AI can help when your brain is full, the math topic is new for you, or it's a difficult topic for you.

CAUTION: AI is recommended for clarifying mathematical content knowledge. AI should not be used to replace mathematical knowledge or decision making.

How to use AI well:

1. Clarify the mathematics, e.g., "Help me think about the components of number sense in this lesson."
2. Design access without losing the math, e.g., "Help me think about how students could show understanding."
3. Check for drift, e.g., "Help me think about where students could succeed without understanding."

Sample prompt: Attach the CONS summary on the next page. Then ask "I am teaching a lesson on _____ to students who _____. Using the attached framework, help me think about…"

Remember

- You decide what counts as good mathematics.
- You decide what counts as evidence of understanding.
- You reject AI suggestions that weaken the math. If AI output feels shallow, push for depth. If it feels procedural, refocus on meaning. If it feels oversimplified, question it.
- You adapt ideas based on your context.
- AI can help us think better, but it cannot decide what matters.

Components of Number Sense Summary

- These components are not hierarchical. They all exist in all math at all levels.
- Language is central. It is how the components are connected.
- The components of number sense provide entry points to work with and understand novel mathematical situations. The goal is not necessarily to identify all eight components every time you teach a lesson. It is to use the components as lenses for understanding mathematics more deeply.

Component	Definition	Question
Quantity and Magnitude	Amount and relative size	What do the numerals represent?
Numeration	Naming numbers and operations	What do these numbers and operations mean? E.g, what is a fraction, what is radical?
Equality	The equal sign shows that two expressions have the same value	What values are the same?
Base Ten	Our number system is based on groups or magnitudes of 10.	Where are sets, multiples or powers of ten?
Form of a Number	Numbers can be written in different forms	Do I like the form this number is in?
Proportional Reasoning	Multiplicative relationship between quantities	Does my answer make sense proportionately? What is the multiplicative relationship (not just an additive one)?
Algebraic and Geometric Thinking	Knowing what you know to find what you don't know. Using spatial sense and logic.	Is there a visual way to think about this? How can I use what I know to figure out what I don't know?
Language	Vocabulary, discussion, explanation	How do I use language to make connections between components?