Now You Are Speaking My Math Language!

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A little about me

- Educator for 19 years
- Instructional Coach for last 6 years
- BA - Elem. Ed w/Middle School Math Endorsement
- MS – Reading Specialist
- ELL – Endorsement
- MS – Educational Administration as of May 11.
- Served as KATM President
- Served on two NCTM Committees.
There is a math language.
What we say and write does matter!
8 Mathematical Practices

1. Make sense of problems & persevere in solving them
2. Reason abstractly & quantitatively
3. Construct viable arguments & critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for & make use of structure
8. Look for & express regularity in repeated reasoning
Today’s Agenda

- Attend to Precision for Teachers
- Attend to Precision for Students
- Writing Strategy for Students in Math
Attend to Precision
For Teachers
What we say matters.
An integer is a counting number, their opposites, and zero. They are a rational number with only zero's after the decimal point.
Definition of integer

1: any of the natural numbers, the negatives of these numbers, or zero

2: a complete entity
Sometimes teachers don’t use specific vocabulary at all.
Teacher: “Which of these is easier?”

The lesson was about the associative property.
What we write matters.
Solving Equations

Does $x \neq 3$ mean the same as $x = 3$?
Parenthesis for something other than Order of Operations?

Does placing parenthesis here matter later?
Example from a Math 1 class.
What is the most common mistake for solving this problem?
\[
\frac{5p}{6} - 15 = 10
\]

\[
\frac{5p}{6} + 15 + 15 = 25 \cdot \frac{6}{1}
\]

\[
= 150
\]
\[
\frac{5p}{6} - 15 = 10
\]
\[
\frac{5p}{6} + 15 + 15
\]
\[
= 25 \cdot \frac{6}{1}
\]
\[
= 150 \cdot \frac{6}{5}
\]
\[
p = 30\]
\[ 1^3 = \binom{6}{1}^3 = 1 \]
24 \times 4 = 96 \times 4 + 15 = 399 - 74 \times 2 \times 3 = 1,950 + 150 + 3 + 10 + 132 = 202
Attend to Precision
For Students
Organized Chaos?

\[ 22 = (-14 \div 7) + (-10 + 2) \]

\[ \frac{27}{3} - \frac{7}{4} = \frac{21}{12} + \frac{7}{12} \]

\[ 0.2 \div \frac{1}{2} = 0.4 \]

\[ 32 \div 8 = 4 \]

\[ \sqrt{300} = 17.8 \]

\[ 48 \times 2 = 96 \]

\[ 1.2 \div 10 = 0.12 \]

\[ 5.2 \div 5.18 = 5 \]

\[ \sqrt{3.5} = 1.8 \]

\[ \frac{17}{130} \]
Some work makes incorrect statements.

\[3 \times 4 = 12 + 2 = 14 \div 7 = 2 - 2 = 0\]
Why might this student struggle with order of operations?

Why might this student struggle with solving equations?
Part 1 and 2
Take a-ways for teachers and students

- Know how what you teach applies beyond you.
- Add on to previous knowledge.
- Be consistent with vocabulary.
- Teach students that structure matters when representing thinking.
Another area of attending to precision is with explaining work.
Writing Strategy in Math

- More Precise Responses
Even though our terminology changes, the order and overall way that we approach our paragraphs remains the same.
I have three academic goals for 7th grade. First, to get at least a 3.7 GPA. I can achieve that grade by only getting 2 B’s. Second, have at least a B in all of my classes. I can achieve that goal by getting all of my work done and turning it in on time. Third, to make honors, I can achieve that goal by getting an A in every class and paying attention in class. In conclusion, my three academic goals for 7th grade year are to get at least a 3.7 GPA, to only have two B’s, and to make honor roll (or honors).
Writing Across the Curriculum

ELA - Writing paragraphs
1. Topic
2. Detail
3. Support
4. Closing

Math – Solving Problems
1. What is the Question
2. Available Information
3. Show your thinking
4. Final Answer

Even though our terminology changes, the order and overall way we approach our written presentation remains the same.
4. What is the balance after the purchase?

$200  beginning balance

$317.25  spent using debit card

$200 + $317.25 = $517.25

After the purchase with the debit card he had an account balance of $-117.25.
What % of the questions did she get correct?

25 # of questions on Quiz  whole
22 # questions correct  part

\[
\frac{\text{Part}}{\text{Whole}} = \text{Part} \div \text{Whole}
\]

\[
\frac{22}{25} = \frac{22}{25}
\]

\[n = 0.88 \text{ or } 88\%
\]

Susie got 88% of the questions correct.
How would this strategy help students attend to precision when solving math problems?
Tweet Time

- Tweet something you learned from this session and include @staceybell76 and #NCTMannual
Thank you for attending my session!

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Mr. Henderson did not realize his checking account had a balance of $200 when he used his debit card for a $317.25 purchase. What is his checking account balance after the purchase?

Susie took a 25 question quiz. She got 22 of the questions correct. What percent of the questions did she get correct?