Writing in Math Class

Take Aways:

\*writing is a building and expressing mathematical proficiency

\*different prompts lead to evidence of different elements of proficiency

\*writing in the math class:

 -model, model, model

 -think alouds

 -create class examples, display in class for student reference

\*kids need to show their understanding using numbers, words, and pictures

\*kids need a specific place to write, (ie journal)

 -thinking notebook

 -evidence of their thinking in their own words

\*can be entrance slips

 -“The most important thing about \_\_\_\_ is…”

 -“The tricky part about \_\_\_\_\_\_ is…”

 -“When working with \_\_\_\_\_ always remember to…”

 -“We’re still a bit fuzzy about \_\_\_\_”

 -“We got this…but we don’t got this part yet…”

\*definitions: kids write definitions in their own terms

 -illustrate your definition

 -write examples and NON examples

 \*a few times a week (at least once per week)

\*Have students write a “how to” piece for another student

\*there must be a discussion about kids giving feedback, “how are we helpful and not hurtful?” Listening or reading other’s work

\*visual math word wall-

 -words should have a visual representation, not just a word

\*kids will need to show two different ways to solve problems:

 -general method

 -specialized strategies

 -then they need to write about how they solved it

\*model=how you solved it

strategy=what you did with your numbers

\*three systems called out on CCSS:

 -open number lines

 -bar diagrams

 -number bonds

\*decontextualizing: the answer is ¾, what is the question?

 -write a problem where the answer is 7

\*problem of the day might take 3 or 4 days:

 -write about it with numbers

 -write about it using pictures

 -write about it using words

\*first thing kids should do is make a plan to solve it

\*5 types of understanding prompts:

 -conceptual understanding prompts (explain their understanding of concepts and big ideas. Helpful to use graphic organizers, ie Frayer Model)

 -procedural (explaining the “how to”)

 -strategic (discussing the use of efficient strategies)

 -adaptive reasoning (students communicate their thinking, understanding, defend their ideas, map out their ways of knowing)

 -mathematical disposition (write about yourself as a mathematician. Students think about what they know and don’t know and what they kind of know. Self-assessing in a deep, critical, and thoughtful way.)

 conceptual prompts:

 -“\_\_\_\_\_ is like..”

 -“We use \_\_\_\_\_ for”

 -“If we didn’t have \_\_\_\_ then we would not be able to \_\_\_\_\_\_”

 -“Write everything you know about \_\_\_\_\_\_”

 -“Write some examples of \_\_\_\_\_\_”

 -“ Make up a 5 question test about \_\_\_\_\_\_\_\_ (make 3 easy problems and 2 hard problems)

 -“Write a story/word problem who’s answer is \_\_\_\_\_\_”

 -“Why?”

 -“The most important thin about \_\_\_\_\_ is …”

 -What does \_\_\_\_\_\_ mean?”

 -“Explain \_\_\_\_\_\_\_\_”

 -“What does \_\_\_ mean in your own words?” (Use the current vocabulary)

 -“\_\_\_\_\_\_ is like…”

 -“We use \_\_\_\_\_\_\_ for…”

 -“If we didn’t have \_\_\_\_\_\_ then we wouldn’t be able to …”

 -“Write everything you know about…”

 procedural prompts:

 -“How do we \_\_\_\_\_\_”

 -“What are the steps for solving this problem?”

 -“Why can’t I \_\_\_\_\_”

 -“Tell me how to \_\_\_\_\_”

 -“When you \_\_\_\_\_\_, watch out for \_\_\_\_\_\_”

 strategic competence:

 -“Explain your strategy”

 -“How did you solve this problem? What strategy did you use and why?”

 -“In what way can we \_\_\_\_\_\_ “

 -“Explain two ways to solve this problem.”

 -“Explain a fast way to solve this problem.”

 adaptive reasoning:

 -“The thing you have to remember with this kind of problem is…”

 -“Tips I would give a friend to solve this problem are…”

 -“Prove…”

 -“Convince me that…”

 -“Explain why \_\_\_\_\_\_ is not true.”

 -“Explain why \_\_\_\_\_\_ is true.”

 -teacher gives an example, and then asks: “Why can’t I do that?”

 -teacher gives an example, and then asks: “Why doesn’t that work?”

 -teacher gives an example, and then asks: “Is that true or false?”

 -teacher gives an example, and then asks: “Why is that true?”

 -teacher gives an example and then asks: “Why is that false?”

 -teacher gives an example and then asks: “\_\_\_\_\_\_ says \_\_\_\_\_\_ and \_\_\_\_\_\_ says \_\_\_\_\_\_. Who is correct? Why?”

 mathematical disposition:

 -“This is the tricky part…”

 -“I still need to learn more about…”

 -“Was this problem hard or easy? Why?”

 -“Draw a picture of a mathematician. Write about where they are and what they’re doing.”

 -“Write your math autobiography.” <http://www.masters.ab.ca/bdyck/math/biography/>

 -“This is how I feel about math…”

 -“Do you like math? Why or why not?”

 -“Today I learned…”

 -“I’m still a bit fuzzy about…”

 -“Today we did…”

 -“This is the math we’re practicing…”

\*self assessment: after tests, have students review their tests and reflect on:

 1. what went really well?

 2. what they did wrong?

 3. where they still need help?

 4. what they are going to do to learn what they still don’t know.

\*MP1: different kinds of problems

 -12 different kinds of addition and subtraction problems

 -9 multiplication and division problems

\*problem writing: write a story for this problem and solve: 200-99

 -write a story for this problem: 165/ 49

 -write a math problem to go along with this picture

 -write a 2-step story problem

\*MP 2 and 3: reasoning and building arguments

 -prove it papers

 -challenge it papers (give the kids the wrong answer and have them challenge it)

 -convince me papers

References:

2nd, 3rd, and 4th: Inside mathematics <http://insidemathematics.org/index.php/mathematical-content-standards>

Provides activities for each strand. Suggested to do the “tasks” and not “problem of the month”

Illustrative Mathematics

<http://www.illustrativemathematics.org/standards/k8>

can look at examples of math by domain or grade level

Georgia math

<https://www.georgiastandards.org/Common-Core/Pages/Math-K-5.aspx>

-every grade, every domain, all prompts, assessments, activities

Math standards PDF

<http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf>

Frayer Model:

Definition (in your own words)

Facts/ characteristics

word

Examples using numbers, words, pictures

Definition (in your own words)