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)