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EDG565/EDU336/EDG515: Methods of Teaching Math

Week 4 Math Quiz

- What are 3 criteria to determine if a math task is "rich" enough, relevant, and rigorous to engage students?

“When selecting a task, it is important to select rich tasks in which all students can engage in relevant, rigorous, and meaningful mathematics.” (Katt et al., 2021, p. 97). In *Answers to Your Biggest Questions about Teaching Elementary Math: Five to Thrive*, a very useful and comprehensive chart provides eight characteristics of rich math tasks. The three that stand out in particular as essential characteristics are 1) the task has meaningful context, 2) the task has multiple entry points, and 3) the task provides opportunities to communicate reasoning. There will be curiosity if the task has meaningful context for the student. Suppose the student can access the task in a way that is available to them based on their abilities, background, and learning style. In that case, they will have greater confidence in approaching and embracing the productive struggle. Finally, the ability to communicate reasoning is a skill that does not usually come readily to many people. This criterion is about learning a life skill to transfer to other areas in their growth outside of the classroom.

- List 10 topics in math and the 10 manipulates you can use to teach the concept. This can be in chart form.

Ten Topics in Mathematics and A Manipulative to Teach the Concept	
Number Concepts (K-2)	Counters-Bears, buttons, tiles, cubes, etc.
Basic Facts (K-1)	Ten Frames and Two Color counters
Addition and Subtraction (K-2)	Dominoes
Making Tens (1-3)	Connecting Cubes
Place Value (1-5)	Base Ten Blocks
Geometry (K-5)	Pattern Blocks
Area and Perimeter (3-5)	Color Tiles
Fractions (3-5)	Fraction Tiles
Measurement (K-5)	Cuisinaire Rods
Problem-Solving	Ten-Sided Dice

- How is literature best woven into the math classroom?

Children's Literature is best woven into the classroom as a tool to help students make connections, problem-solve, and identify with a situational reality in which they can identify. It is especially inviting for the student to be able to engage in a manner that provides a connection with a book of direct meaning to them or a popular book they enjoy. This can be done before, during, or after the lesson. The teacher can benefit from the opportunity to pre-assess skills and introduce a new topic or vocabulary in a relevant way. The student will have their interest piqued at the onset. During the lesson, of critical importance is the gain resulting from higher-level thinking opportunities and knowledge of new concepts and representations not found in a textbook. After the lesson, is a bonus opportunity for journaling and extending "what if's?" to further connections and reinforce vocabulary.

- Give an example of: A physical representation, a visual representation, and a symbolic representation. Don't use the same ones in the text.

Representations in math provide powerful learning tools for students to support their understanding and fluency. They can be a conduit for material to be transferred from short-term to long-term memory when shaping the cognitive load appropriately. An example of a physical representation is using base ten blocks to represent place value; of a visual representation is drawing a picture of a triangle as a three-sided shape; and  $1 + 0 = 1$  for the addition law of zero.

- What are five types of math questions (p. 152)?

Five types of math questions are questions that:

1. Provide a start and entry point for a problem or task.
2. Enable the teacher to monitor students' progress and encourage perseverance in productive struggle.
3. Help the students make connections between ideas and applications.
4. In the context of class discussions, provide opportunities for the students to make sense of mathematics.
5. Engage the students in utilizing representations.

## References

Katt, S., SanGiovanni, J. J., Knighten, L. D., & Rivera, G. (2021). *Answers to Your Biggest Questions about Teaching Elementary Math: Five to Thrive [series]*. Corwin Press.