

# TeachME Professional Development

## Cultivating Math Skills in Young Learners

### Whole School Approaches to Numeracy

1. Improvement in numeracy achievement requires a whole school commitment to an organization's culture of collaboration, planning, and the development of an inquiry approach to teaching and learning numeracy.

- A. True
  - B. False
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### Effective Numeracy Teachers

2. Each of the following is an accurate statement about effective numeracy teachers EXCEPT:

- A. They explicitly teach mathematical language and the concepts that the words describe.
  - B. They scaffold from non-mathematics understandings to precise mathematical ones
  - C. They explicitly teach mathematical concepts needed for numeracy in ways that modify common or informal understandings and developing deep mathematical understandings
  - D. They teach students mathematics as methods for developing new skills
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3. To problem solve effectively in numeracy, students need to know how to clarify the problem, choose the mathematics, tools, procedures and/or skills required, use and or apply what has been chosen, interpret and check if the solution worked, and:

- A. Use self-reflection to determine what worked and what didn't
  - B. Communicate and talk about the steps they took to reach the solution
  - C. Document effective strategies
  - D. Determine if there are other methods to solve the problem
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### Planning and Teaching for Numeracy

4. Effective planning and teaching emphasizes forward design and the importance of

clear links between mathematical knowledge and learning goals and assessment tasks.

- A. True
  - B. False
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## Monitoring and Assessment

5. To assess the deep understandings of mathematics, teachers must ensure that they have taught the understandings to all students using differentiation strategies and an approach that incorporates:

- A. Modeling and practice
  - B. Fundamental math skills and basic problem solving
  - C. High expectations
  - D. Visual organizational methods
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## Numeracy Key Elements K-2-Key Messages

6. While the ultimate goal for early learning may be to develop students' rigor and fluency in mental computation, in the early years, the emphasis should be on establishing deep understandings about numbers and how they work.

- A. True
  - B. False
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## Planning-Place Value

7. Initially, the best way to teach understanding of place value is to focus on:

- A. Group counting or skip counting
  - B. The relationship between ones, tens and hundreds
  - C. The naming of small numbers
  - D. Adding and subtracting
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## Teaching Students to Deeply Understand Operations

8. Students should be encouraged to use everyday language such as "Who has the most?" and "What is the total?," rather than using mathematical terms such as add and subtract, as this will help them with their mathematical learning outside of school.

- A. True
  - B. False
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9. One of the best ways to promote the move on from additive to multiplicative thinking is by:

- A. Breaking memorization down into easy steps
  - B. Using relatable examples
  - C. Starting with multiples of 0 and 1
  - D. Using a number line
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10. Which of the following is NOT one of the authors' recommendations for assisting students who don't seem to be progressing in math?

- A. Consider flexible learning environments for struggling students
  - B. Take a close look at the assessment tasks and their alignment with the intended learning
  - C. Consider the explicit teaching or re-teaching which may be required to support the learners
  - D. Determine what strategies might be needed that can be modeled by the teacher and or peers and what materials or visual supports might be useful
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## Key Messages

11. One of the keys to teaching students in K–2 how to recognize and use patterns and relationships as the building blocks for more formal learning is to ensure that they can have deep understanding about patterns, can generalize about them, and can:

- A. Use patterns to provide a sense of order
  - B. Understand the relationship between the elements of patterns
  - C. Recognize and describe the variation or change in relationships
  - D. Use patterns to develop critical thinking
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## Putting it Into Practice

12. The two types of patterns that young learners need to recognize and formulate are repeating and:

- A. Sorting
- B. Generalizing
- C. Growing

## D. Ordered

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### Links Across The Curriculum

13. Threading activities, which are often used to develop fine motor skills, also provide many opportunities to make, continue, talk about, and explain patterns, such as by having students create and describe the patterns they make by threading fruit onto bamboo skewers.

- A. True
  - B. False
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### Using Fractions, Decimals, Percentages, Ratios and Rates

14. Early learners generally enter school without any experience or understanding of the idea of fractions, so teachers need to start from the beginning when teaching this concept.

- A. True
  - B. False
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15. Typically, by the end of Year 2, students should be able to demonstrate knowledge of fractions, decimals, ratios and percentages by:

- A. Recognizing a 'whole' and 'parts of a whole' within everyday contexts
  - B. Recognizing that a whole object can be divided into equal parts
  - C. Identifying quantities such as more, less and the same in everyday comparisons
  - D. Visualizing, describing, and solving problems using halves and quarters
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### Monitoring and Assessment

16. One way to involve students in the assessment process is to give them questions with a hypothetical student's response, and ask them:

- A. What would you do differently?
  - B. How would you help them with this problem?
  - C. Can you show me how to solve the problem with a picture?
  - D. What other problem is like this one?
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### Using Spatial Reasoning

**17. When using spatial reasoning in mathematics, students learn to visualize, identify, and sort objects while:**

- A. Describing their key features in the environment**
  - B. Interpreting their purpose or use**
  - C. Drawing conclusions with limited information**
  - D. Learning how to solve problems through manipulation**
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**18. By the end of Year 1, students learn to use spatial reasoning to sort and name 2D shapes and 3D objects, and:**

- A. To explain the effects of one-step transformation**
  - B. Follow directions to demonstrate understanding of common position words and movement**
  - C. Give and follow directions on maps and diagrams of familiar locations**
  - D. To order shapes and objects using informal units and interpret simple maps of familiar locations**
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**19. When learning to visualize 2D shapes and 3D objects, students will initially engage with the shapes by touching, turning or taking them apart, and then learn the specific words to identify them in their environment such as square, circle, triangle, rectangle, sphere or ball, pyramid, or cone.**

- A. True**
  - B. False**
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## **Links Across the Curriculum**

**20. Play opportunities with large construction blocks provide many opportunities for teachers and other adults to model the language of shape and location and challenge students' thinking.**

- A. True**
  - B. False**
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## **Interpreting Statistical Information**

**21. The two key elements involved in interpreting statistical information are collecting, organizing, and displaying data and interpreting data displays.**

- A. True
  - B. False
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## Monitoring and Assessment

22. Assessing the interpretation of data in K-2 involves giving students lots of practice with different types of displays including tables and charts, and children need to specifically be taught step by step strategies and ways that are:

- A. Specialized
  - B. Structured
  - C. Holistic
  - D. Deliberate
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## Using Measurement

23. Which of the following is NOT one of the deep understandings needed to estimate and measure?

- A. What needs to be measured
  - B. Units of measurement
  - C. Measuring using direct and indirect methods
  - D. Understanding how the basic concepts of time are interwoven with measurement concepts
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## Putting it Into Practice

24. Indirect measuring requires working out how many repeats of the unit used are needed to match the object to be measured, and it is used when the object or shape is large or complex.

- A. True
  - B. False
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