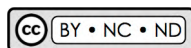# Teaching for Student Use of the Mathematical Practices

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1

Common Core State Standards

- Define what students should understand and be able to do in their study of mathematics. (p.12)
  - Standards for Mathematical Practices
  - Standards for Mathematical Content

Common Core State Standards

Standards for Mathematical Practices describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle and high school years.

3

Standards for Mathematical Practices

1. Make sense of problems and persevere in solving them.

2. Reason abstractly and quantitatively.

3. Construct viable arguments and critique the reasoning of others.

4. Model with mathematics.

5. Use appropriate tools strategically.

6. Attend to precision.

7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.

4

Content Changes in CCSS

Addition and Subtraction Trajectory

  Operations and Algebraic Thinking (OA)

  Number and Operations in Base Ten (NBT)

  States use of concrete and pictorial in Kindergarten, Grades 1 and 2.

  States use of strategies in Kindergarten, Grades 1, 2 and 3.

Operations and Algebraic Thinking **K.OA**

Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

3. Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., **by using objects or drawings, and record each decomposition by a drawing or equation**
(e.g., $5 = 2 + 3$ and $5 = 4 + 1$).

5. **Fluently add and subtract within 5.**

Operations and Algebraic Thinking **1.OA**
Add and subtract within 20.

6. Add and subtract within 20, **demonstrating fluency for addition and subtraction within 10**.
Use strategies such as **counting on**;
>**making ten** (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$);

>**decomposing a number leading to a ten**
>>(e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$);

>**using the relationship between addition and subtraction**
>>(e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and

>**creating equivalent but easier or known sums**
>>(e.g., adding $6 + 7$ by creating the known equivalent
>>$6 + 6 + 1 = 12 + 1 = 13$).

Number and Operations in Base Ten **1.NBT**

Use place value understanding and properties of operations to add and subtract.

4. Add within 100, including adding a two digit number and a one-digit number, and adding a two-digit number and a multiple of 10, **using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used**

Operations and Algebraic Thinking **2.OA**

Add and subtract within 20.

2. **Fluently add and subtract within 20 using mental strategies**. By end of Grade 2, know from memory all sums of two one-digit numbers.

Number and Operations in Base Ten 2.NBT

5. Fluently add and subtract within 100 **using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction**.

9

Number and Operations in Base Ten **2.NBT**

7. Add and subtract within 1000, **using concrete models or drawings and strategies based on place value**, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method

Operations and Algebraic Thinking **3.OA**
Nothing on Addition and Subtraction

Number and Operations in Base Ten **3.NBT**

Use place value understanding and properties of operations to perform multi-digit arithmetic.

2. Fluently add and subtract within 1000 using **strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.**

3. Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.

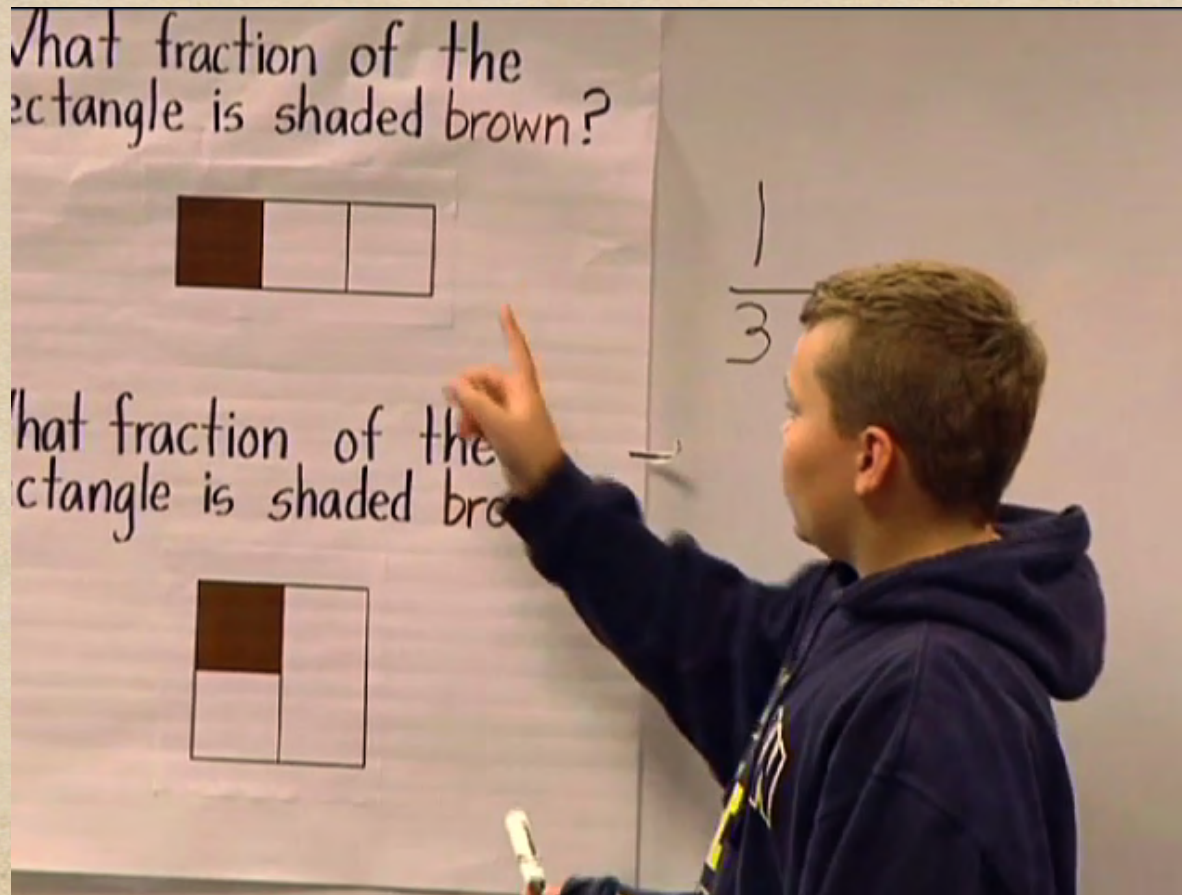# Students Use of the Mathematical Practices

- Watch the following videos to identify:
  - What MP's the children are using
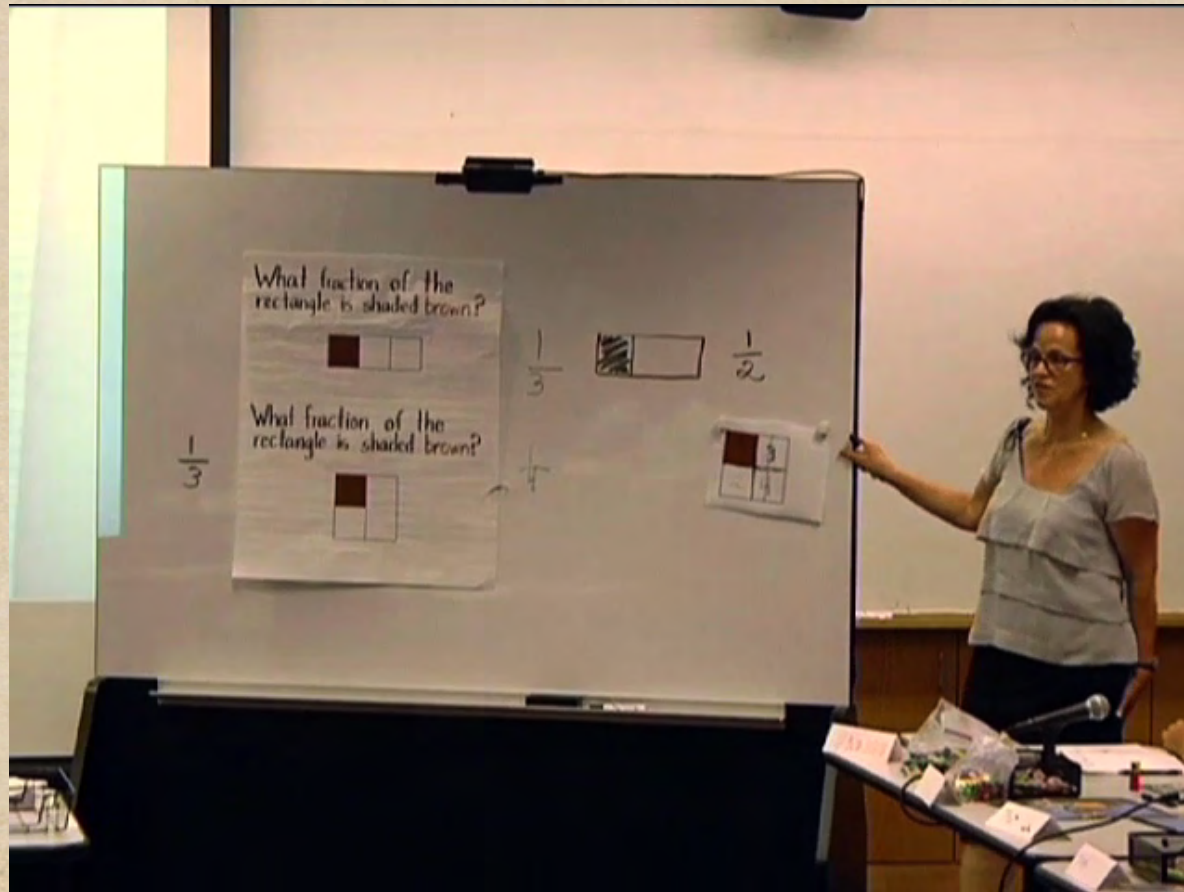 - What the teacher does to facilitate their use

Students Employing the Mathematical Practices

13

Students Employing the Mathematical Practices

14

Students Employing the Mathematical Practices

What Did the Teacher Do to Foster the Students Use of the Mathematical Practices?