Common Core Mathematics
HUFSD

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Please visit my google site for math help/information/games.
Go to my eboard and click on Elementary Math - Google Site
Why has math changed?

Try this now:

For each of the arithmetic exercises below, purposely record an incorrect answer that reflects an error that you think a child might make.

1. $3 + \square = 7$

2. $\begin{array}{c}
42 \\
-17
\end{array}$

3. $\frac{1}{2} + \frac{2}{3} =$
Why has math changed?

When students learn procedures for doing math, without understanding the concepts behind the math, they rely on the numbers and the operation symbols to solve problems without thinking.

Teachers hold number talks to develop students' mental math abilities.

Add 38 and 38 mentally.
Shifts in Mathematics

• **Focus**: learn more about less

• **Coherence**: Build skills across grades

• **Fluency**: Develop speed and accuracy

• **Deep Understanding**: Really know it, really do it

• **Application**: Use it in the real world

• **Dual Intensity**: Think fast AND solve problems
Standards vs Modules

**CCLS**
- List of standards taught at each grade level. Followed by 44 states.

NY adopted these standards and added a few.

**Modules**
- Lessons based on the standards. Used to teach strategies that help the student achieve the standard.

- Guide to help teachers provide students with strategies and tools to become mathematical thinkers. **Models** and **strategies** used are carried throughout all grade levels.
Why?

• Students will become mathematical thinkers and problem solvers. They will look at math flexibly!
• They will understand the BIG IDEA in math: there are many ways to solve a math problem!

2 + 2 STILL = 4
K-5: The story of Units
In these grades, the overarching theme is the UNIT. In PK and K, units are frogs or other objects, and then eventually the numbers themselves: 1 unit, 2 units... Students learn to add by forming a unit of 10, and then larger units of hundreds, thousands, etc. This same concept is applied to fractions. When fractions are thought of as units, the rules they have learned for other numbers apply. For example 3 ninths and 2 ninths equals 5 ninths. Units are also used in multiplication: 3 fours is the same as 12 and can be written as 3 X 4 or 4+4+4

K-2: Focus is on number sense and understanding, addition and subtraction, basic shapes and place value. Students are introduced to mental math and fluency builds on addition and subtraction math facts.

3-5: The focus is on multiplication and division, understanding and using fractions and decimals. Students must be able to solve multi
The Structure of CC Math Lesson

- Fluency
- Application (word problems and brain-teasers and exploratory tasks)
- Concept Development
  - Independent Practice
  - Exit Ticket
- Debrief

Lessons are developed using models to deepen conceptual understanding.
Models used in CC Math

https://www.engageny.org/resource/grades-k-2-math-building-addition-fluency-10-frames-koa4-1oa6-and-2oa2
Number Bonds

Number Bonds: Start in K and move through grade 6. They reinforce part, part, whole relationships and teach students to think about numbers flexibly to make math easier. Used for Addition, Subtraction, Multiplication, Fractions, Unit Conversions.
Grade 3
Multiplication

7 fours can be thought of as 5 fours and 2 fours

7 \times 4 =

5 \times 4 = ____

2 \times 4 = ____

7 \times 4 = (5 \times 4) + (2 \times 4)
Grade 3-4 Number Lines
Telling time using a number line
Rounding using vertical number lines

c. Label the first and last tick marks 8:00 a.m. and 9:00 a.m. Plot a point to show when Jason arrives at school. Label it $A$. Plot a point on the line when the first bell rings and label it $B$. 

![Number Line Diagram]
Rounding using a vertical number line

Because it's a vertical # line, students remember to round up or down.
Moving from concrete to pictorial to abstract (the standard algorithm)
**Number Disks:**

Draw a picture to represent the following: 433 - 227

<table>
<thead>
<tr>
<th>hundreds</th>
<th>tens</th>
<th>ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 hundreds</td>
<td>3 tens</td>
<td>3 ones</td>
</tr>
<tr>
<td>2 hundreds</td>
<td>2 tens</td>
<td>13 ones</td>
</tr>
</tbody>
</table>

433 - 227

**Decomposing Numbers (Making a Ten):**

- 433 - 23 - 204
- 410 - 204
- 206

**Using a # Line:**

**Subtraction as an unknown addend**

433 - 227 = ? is the same as 227 + ? = 433

(Counting up by what you know)

227 + 3 = 230
230 + 100 = 330
330 + 100 = 430
430 + 3 = 433

+ 206
Grade 5 Understanding of Decimal Operations

0.4 \times 10 =

1.324 \times 100 =
The progression of addition and multiplication of decimals

1. Solve, and then write the sum in standard form. Use a place value chart if necessary.
   a. 1 tenth + 2 tenths = ______ tenths = ______
   b. 14 tenths + 9 tenths = ______ tenths = ______ one(s) ______ tenth(s) = ______

\[ \begin{array}{cccc}
\text{ones} & \text{tenths} & \text{hundredths} & \text{thousandths} \\
\hline
0 & 8 & 4 & 6 \\
\hline
0.423 \\
\frac{x}{2} \\
\hline
0.846 \\
\end{array} \]

\[ \begin{array}{ccc}
4 \text{ tenths} & + & 2 \text{ hundredths} & + & 3 \text{ thousandths} \\
\hline
8 \text{ tenths} & + & 4 \text{ hundredths} & + & 6 \text{ thousandths} \\
\hline
0.8 & + & 0.04 & + & 0.006 = 0.846 \\
\end{array} \]
Students learn to create tape diagrams to build understanding of word problems.

Grade 3 Application Problem/Word Problem

Jamal has 8 more marbles than Thomas. They have 20 marbles altogether. How many marbles does Thomas have?

Jamal

[Diagram: 8]

Thomas

[Diagram: ?]

20

Thomas has ______ marbles.
A copper wire was 240 m long. After 60 m was cut off, it was double the length of a steel wire. How much longer was the copper wire than the steel wire at first?
Each bottle holds 900 ml of water. A bucket holds 6 times as much water as a bottle. A glass holds 1/5 as much water as a bottle.

We can use the bottle capacity to form a unit pictorially and illustrate the other quantities with relationship to that unit:

The unit can then be used to answer word problems about this situation, such as, “How much more does the bucket hold than 4 bottles?” (2 units or 1800 ml)
The idea of a unit continues with fractions, and models are used to develop the procedures.
Questions?

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