

Common Core Mathematics Standards: Grade 2nd

Goals

- Explore some tasks
- Unpack the Standards
- Connect back to our classroom

Checking our pulse...

- How are your students doing thus far in math?
- What data or evidence do you have about your students' learning?
- What does the data say?

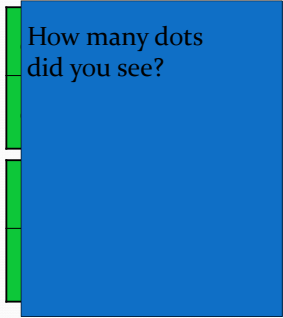
Today's Number

- Today's number is 20
- Write down some "pictures" of 20
- Write 3 addition equations that you can write with an answer of 20 with one addend being larger than 10.
- Write an addition equation where you add 3 numbers and have an answer of 20.
- Write an equation where you add two numbers and subtract 1 number and have an answer of 20.

- $10 + 10 = 20$
- $11 + 9 = 20$
- $12 + 8 = 20$

Watch the box!

How many dots
did you see?



Ten and "some more"

Ten and "some more"

Number Sense...

- What do those two words mean to you ?
- What concepts do your students struggle with?
- How has the Common Core influenced what "number sense" means compared to before?

Students in the Cafeteria

- There are 16 children in the cafeteria. 17 students show up at 11:30 a.m. Then 19 students leave at noon.
- How many students were there after 11:30 a.m.?
- How many students were there after noon?
- Solve it two different ways.

Some different approaches...

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Some different approaches...

$16 + 17$
 $16 + 10 = 26$
 $26 + 4 = 30, 30 + 3 = 33$

$33 - 19$
 $33 - 10 = 23$
 $23 - 3 = 20, 20 - 6 = 14$

Some different approaches...

$$\begin{array}{r} 1 \\ 16 \\ \pm 17 \\ \hline 33 \end{array}$$

$$\begin{array}{r} 2 \ 13 \\ 3 \ 3 \\ \hline -1 \ 9 \\ 1 \ 4 \end{array}$$

Hundreds Board work

- There are 8 children on the playground. More show up. Now there are 22 children. How many more children showed up?
- There are some students in the cafeteria. Fourteen more students arrived. If there are now 91 students how many students were first in the cafeteria?

What do the Standards say?

- 2.OA.1 - Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

What do the Standards say?

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

What do the Standards say?

- 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.

Sorting levels of development

- For each of these determine the order in which the concepts should be learned by students.
- For each-
 - 1) Order these from earliest to latest
 - Develop a rationale
 - 2) What grade level are these ideas introduced?
 - 3) How does the concept relate to your grade level standards?

$$576 + 398$$

Sorting Levels of Development

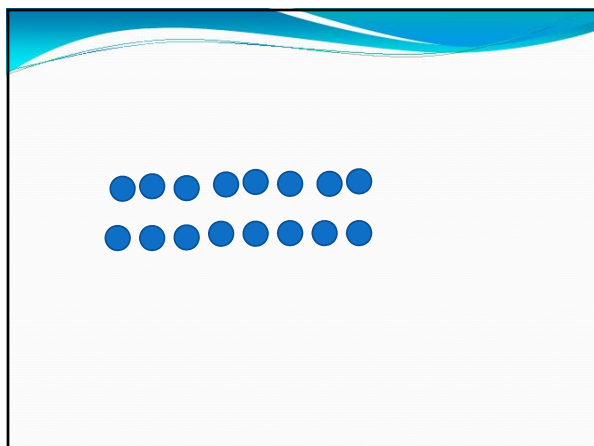
- What does it mean for us as 2nd grade teachers?

Addition and Subtraction Problems

Carol's Candies

Carol had 8 pieces of candy. She had 5 pieces of candy fewer than Steve. How many pieces of candy did Steve have?

- a) Your picture
- b) Why so hard?
- c) How to help students



Carol's Candies

Representations?

Actions?

Carol's Candies

Bobby starts to solve this problem by making a pile of 8 counters. He then says, "fewer means the number goes down." He takes away 5 counters and says, "the answer is 3."

What is Bobby doing?

What teacher moves would support Bobby in productive struggle?

A progression of comparing...

If I have fewer, what do you have?

If you have more, what do I have?



Fewer and More

Who has more? How much more?

Ann  Julio 

Who has fewer? How much fewer?



Fewer and More

Maria has 12 cubes. Ann has more. How many cubes could Ann have?

Ryan has 23 marbles. Mark has fewer. How many marbles could Mark have?



Unpacking a problem...

- What is the referent?
- What is the language variant?
- What relationship is present between quantities?
- How might students use the inverse relationship between addition and subtraction to generate a solution strategy?

Explore these!

Samuel has 5 more pencils than Nancy. Nancy has 6 pencils. How many pencils does Samuel have?

Ike has 4 fewer erasers than Gina. Ike has 5 erasers. How many erasers does Gina have?

Problem types

- Let's look at the chart of problem types
- How do you ensure that students get experiences with all of the various problem types?
- A resource- <http://elemath.pbworks.com>

Problem types

- Let's see how these might look with students....

Math Games

- What is the purpose of playing games in math?

Close to 10

- Turn over 4 number cards. Pick 2 of them to get a sum that is close to 10 as possible.
- Students should build each number and the sum with cubes.
- Want to keep score?
 - Students' score is their distance from 10.
 - Keep playing and keep track of your score.

Ten Plus

- Make columns on your paper:
less than 10, 10, 11, 12, 13, 14, 15, 16, 17, 18
- Draw Two Number Cards and build them with cubes on your Ten Frame
- If your sum is greater than 10 rewrite the equation as $10 + \underline{\quad}$.
- For example if your number cards are 7+5 you would write $10+2$ in your 12 column.

Close to 100

- Turn over 6 cards. Use 4 cards to make 2 2-digit numbers whose sum is as close to 100 as possible.
- Each round your score is your distance from 100.
- E.g., $63 + 38 = 101$. Your score is 1.
- The lowest score wins.
- Play a few rounds.

Close to 17

- Turn over 6 number cards. Pick 4 of them to make 2 2-digit numbers. The goal is to get a difference that is as close to 17 as possible.
- Students should build each number and model how to find the difference with cubes
- Want to keep score?
 - Students' score is their distance from 17.
 - Keep playing and keep track of your score.

Standards for Mathematical Practice

- What are these?
- Why do these matter?

Practice 1- what is your role?

- Using both verbal and nonverbal means, second grade students begin to explain to themselves and others the meaning of a problem, look for ways to solve it, and determine if their thinking makes sense or if another strategy is needed.
- As the teacher uses thoughtful questioning and provides opportunities for students to share thinking, second grade students begin to reason as they become more conscious of what they know and how they solve problems.

Tasks → Mathematical Practices

- Think about the tasks we explored
- How could we help students to...
 - Make sense and persevere while doing these?
 - Model with an equation or representation?
 - Attend to precision through communicating about strategies and mathematical ideas?
 - Construct a viable argument or critique the reasoning of others?

Details of Mathematical Tasks

- Does the type of numbers that we choose matter?
- start with 83
- Subtract 40
- Subtract 12
- Subtract 19

Details of Mathematical Tasks

- Does the type of numbers that we choose matter?
- Let's do some mental math
- Let's start with 25
- Add 20
- Add 12
- Add 28

Number sense/algebra

- Talking about the math during game
- Breaking numbers apart, putting them back together
- Wild card...holding number in their head
- Benchmark numbers
- Fluency with combinations, facts
- Place value

Mathematical Practices

- How do we incorporate these more frequently into our classrooms?
- Pose cognitively-demanding tasks
- Talking with your students about the MPs (kid-friendly language)
- Talking with your colleagues about the MPs
- Incorporating these into assessment

Writing Tasks

- Choose a CCSSM from your grade level- try to focus on OA or NBT Domains
- Write a few tasks that have some rigor and create the possibility of incorporating the Standards for Mathematical Practices.
- Doing Mathematics- tasks that require students to pick a strategy to solve a real-world problem and then explain what they did

Examples

- A carpet is split into smaller sections that has 5 columns and 4 rows. If 2 of the sections have crates in them and the rest are empty, how many sections are empty?
- There are 125 children in the cafeteria. 176 more children arrive. Five minutes later, 89 of the children are in line and the rest are sitting down. How many children are sitting down?

Sharing Tasks

Resources....

- DPI Math wiki
 - Unpacking document
 - Standards for Math Practice explanation
 - Formative assessment tasks
 - 1 unit on number sense per grade level
 - Lessons for Learning (being revised this summer)

- Drew.polly@uncc.edu
- <http://elemath.pbworks.com>

Unpacking- MPs Unpacked

Standards for Mathematical Practice in Second Grade

The Common Core State Standards for Mathematical Practice are practices expected of all students in Grades K-12. Below are a few examples of how these Practices may be integrated into mathematics instruction.

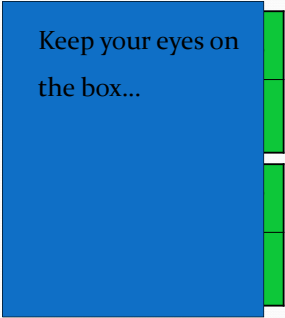
1) Make Sense and Persevere in Solving Problems.	Mathematically proficient students in Second Grade explain their thinking as they solve a problem and find an entry point or a way to start the task. They use concrete models and strategies and become independently proficient on their own. They still rely on concrete manipulatives and pictorial representations to solve problems. They use their understanding of place value to solve problems. They use their understanding of operations to solve problems. They use their understanding of fractions to solve problems. They use their understanding of measurement to solve problems. They use their understanding of geometry to solve problems. They use their understanding of data to solve problems. They use their understanding of statistics to solve problems. They use their understanding of science to solve problems. They use their understanding of social studies to solve problems. They use their understanding of language arts to solve problems. They use their understanding of art to solve problems. They use their understanding of music to solve problems. They use their understanding of physical education to solve problems. They use their understanding of health to solve problems. They use their understanding of environmental science to solve problems. They use their understanding of technology to solve problems. They use their understanding of engineering to solve problems. They use their understanding of mathematics to solve problems. They use their understanding of science to solve problems. They use their understanding of social studies to solve problems. They use their understanding of language arts to solve problems. They use their understanding of art to solve problems. They use their understanding of music to solve problems. They use their understanding of physical education to solve problems. They use their understanding of health to solve problems. They use their understanding of environmental science to solve problems. They use their understanding of technology to solve problems. They use their understanding of engineering to solve problems. They use their understanding of mathematics to solve problems.
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Sharing Tasks

- Drew Polly- Drew.polly@uncc.edu
- <http://elemath.pbworks.com>

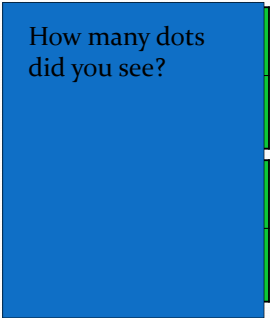
Watch the box!

Keep your eyes on the box...



Watch the box!

How many dots did you see?



Ten and "some more"

The diagram consists of three ten-frames, each a 2x5 grid. The first ten-frame on the left is completely filled with 10 black dots. The second ten-frame in the middle has 4 black dots in the top row and is empty in the bottom row. The third ten-frame on the right has 5 black dots in the top row and 1 black dot in the bottom-left corner of the bottom row.