See It, Touch It, Move It:
Deepening Place Value Understanding Through Models and Math Talk

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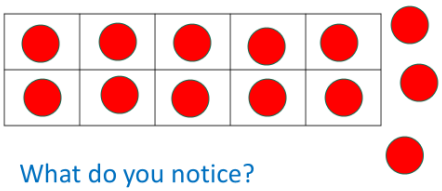
Exploring Beginning Understandings

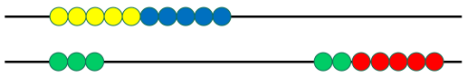
Show me 13 counters.

"They don't fit."
How many fit?
How many are left?
13 is 10 and 3 more



What do you notice?

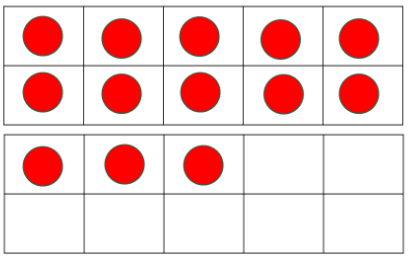
Rekenrek - Math Rack



What do you notice?
Do more trials, record, and discuss.

Bead Counters
Show 13

Explore in a Different Way
Show 13 on double ten frames.



What do you notice?
Do more trials, record, and discuss.

Linking Tens

Count 13 linking cubes.
Link 10 cubes together and find the total again.

How did you find the total this time?
Could you count on?
Which way would be easier? Faster?
Would the total always be the same? Why?
13 is 10 and __ more

Repeat with different amounts of cubes (11-19).
Discuss observations.

Model and Compare

Students all use a different model to show 15.
Count out 15 individual units.
Bundle and observe.

- Cups and counters
- Links in a chain
- Counters on 10 frame
- Sticks and rubber bands
- Trains of unifix cubes

Did we all get the same thing? Why?
15 is 10 and 5 more

Consider Context
There are 12 markers on the table.
10 of them fit in the box.
How many will not fit in the box?

Investigating 2-digit Numbers

1. Have partners count out 25 unifix cubes to show the quantity.
2. Have them make chains of ten and then check the total.

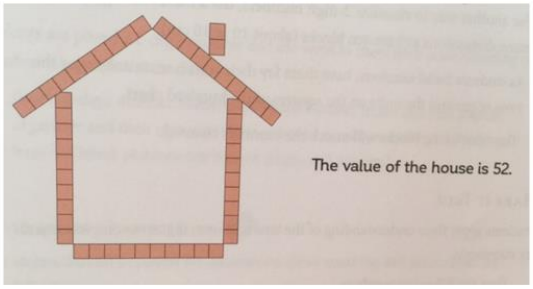
Which was easier to count? Why?
Which was faster? Why?
Do the different ways of counting give you the same answer? Why?
Create a chart to record students' data.

Observe and Consider

Number	Tens	Ones
25	2	5
32	3	2
47	4	7
26	2	6
38	3	8
41		

What do you notice?
Does it make sense? Explain.
Tell your partner how many tens and ones are in 41.
Try it and see if you were right.

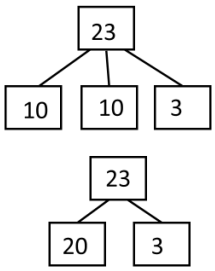
Build a House

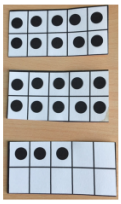


Pose Problems
Dinner at the Panda Palace by Stephanie Calmenson
How many animals came to the diner?
Rooster's Off to See The World by Eric Carle
How many animals went off to see the world?

Building Numbers with Ten-Frames

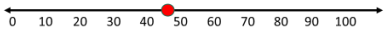
Can you show it with a number bond?





Thinking About Numbers

- *Place 47 where it belongs on a 1-100 number line with only tens marked.*
- *Between 40-50? Why?*



Building 10-100

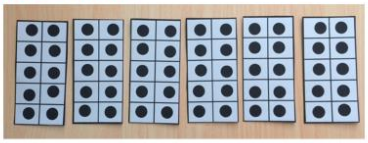
Using ten-frame cards, show the numbers 10, 20, 30, 40…100.

What do you notice?

60 is 6 tens

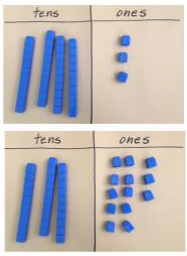
40 is 4 tens

Later… 120 = 12 tens



Can numbers be named in different ways?

43



43 = 4 tens and 3 ones

43 = 3 tens and 13 ones

43 = 2 tens and 23 ones

What do you notice?

Can you explain it?

What happens to the ones when you rename a 10?

Could you prove that each way equals 43?

Move from Bundling Objects to Pre-Bundled Manipulatives

Introduce Base Ten Blocks

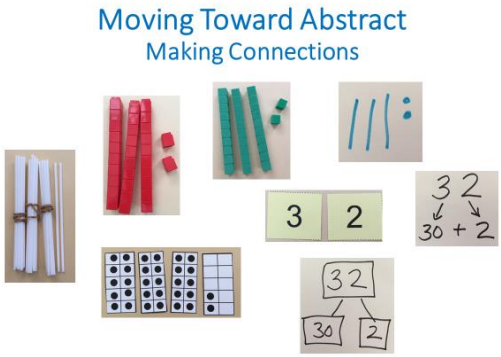
- Allow students to explore the blocks.
- Have students justify the value each block represents.

Drawing Numbers with Sticks and Dots

Show 34 with base-ten blocks.

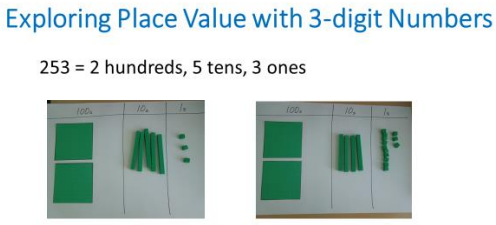
Draw 34 with sticks for tens and dots for ones.

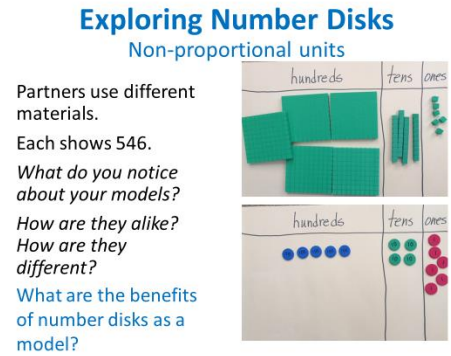
- *Explain your drawing.*
- *How did you know how it should be drawn?*



Building Three-digit Numbers

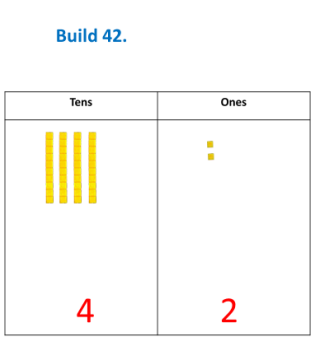
- Pose a number: 253
- Build the number.
- Tell how many hundreds, tens, and ones.
- Can you show it in a different way?

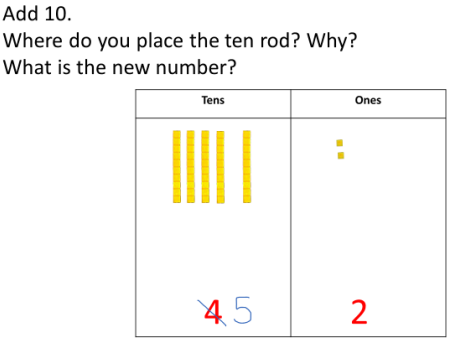




Investigating how to mentally add and subtract 10 and 100 from a 2-digit number

Brendan had 42 baseball cards.
His mom gave him a package with 10 more cards.
How many cards did he have in his collection then?





Figuring Out the Rule

Repeat with other numbers.

What do you notice?

What digit changes? Why?

42	21	81	54	78
52	31	91	64	88

Predict: What is 46 + 10?
Check your prediction with a model.

Foundations

The Role of the Hundred Chart

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

Do students move up and down on the hundred chart to find 10 more and 10 less?

Or… do students observe and discuss what they see happening to the digits on the hundred chart?

Do they develop insights about the digits?

Adding 10 More

- Represent 5 with base 10 blocks.
- Add a 10 (rod) and record the new number.
- Continue adding one more 10 (rod) until you reach 95.
- Record the numbers in a column.

Build a Column

5
15
25
35
45
55
65
75
85
95

What do you notice?

What is the pattern?

Where have you seen something like this before?

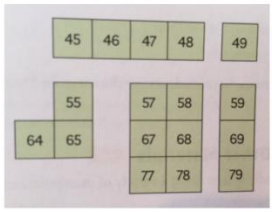
Why do columns on a hundred chart look this way? Will every column follow this pattern?

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

Try it beginning with 7, 9, 3…
Do the same patterns appear?

Hundred Chart Puzzles

Cut apart a hundred chart and have students use their understanding of two-digit numbers to reassemble it.

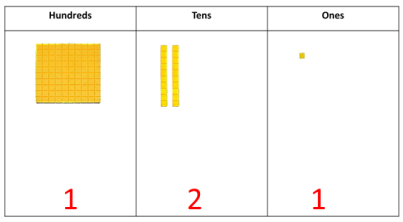


MATH in PRACTICE

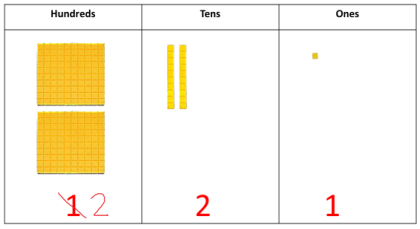
Mentally add 100 to a 3-digit number, and mentally subtract 100 from a 3-digit number.

Stuart Elementary School was preparing for a cookout.
They already had 121 paper plates, but knew they needed more, so they bought a package of 100 paper plates.
How many paper plates did they have for the cookout?

Modeling & Observing What Happens
Build 121.



What is the new number?



Figuring Out the Rule

Repeat with other numbers.

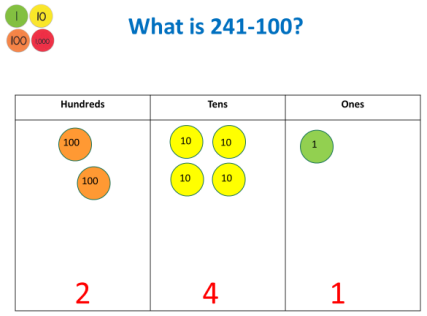
What do you notice?

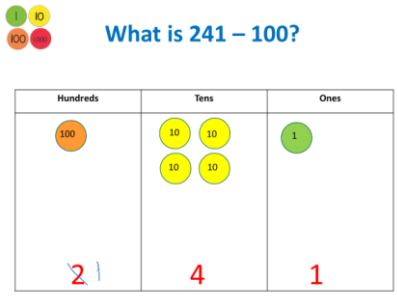
What digit changes? Why?

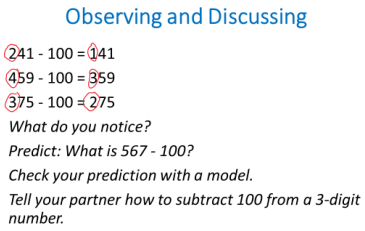
121	243	621	548	783
221	343	721	648	883

Predict: What is 468 + 100?
Check your prediction with a model.

Chelsea Farms had 241 pumpkins to sell at the Fall Fair.
They sold 100 pumpkins on the first day.
How many pumpkins do they still have to sell?







Strengthening Place Value Understanding

- Create and explore varied models to visualize place value concepts.
- Discuss observations.
- Make comparisons between models.
- Move from concrete to abstract.
- Encourage students to verbalize rules/generalizations.

A deep understanding of place value provides a strong foundation for understanding numbers and operations.

For more ideas:

***Math in Practice* (www.mathinpractice.com)**
This series is filled with lesson ideas, instructional strategies, practice tasks, and many online printable resources to make teaching K-5 math more meaningful and more fun. There is a book for each grade level K-5 that contains a wealth of grade-specific activities, as well as a *Guide for Teachers* filled with instructional strategies to support greater understanding of math concepts. A *Guide for Administrators* offers tips and strategies for math coaches/administrators. Visit the website at **www.mathinpractice.com** to view samplers, see videos, and learn more about the series.

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