We will explore...

- Rational for Study
- "Teen" Number Challenges
- Research Connections
- Study & Results
- Next Steps & Questions?

Background of Study

- Math Recovery
- 1:1 intervention with 1st graders
- High percentage of students who had issues surrounding "teen" numbers

"Teen" Number Challenges

- 12/20/21 mix up
- "Teen" number and decade number +1 mix ups (13 and 31; 14 and 41; etc)
- 13, 14 expressive language
- Counting backward from greater than 10

These issues lead to...

- Inefficient strategies
- Place Value Misconceptions

$$23 + 34 =$$

- Learning procedures without understanding

Intervention Strategies Tried...

- Say it louder/say it again
- Games/practice/ LOTS of intervention
- One-teen, two teen, three teen, etc...
- "Tenny". (Tenny-one, tenny-two)

What Does Brain Research Tell Us about Learning to Count?

How the Brain Learns Mathematics, David Sousa

- The human brain comprehends numerals as quantity, not as words.
- Our number system may indeed be a language, but it is a very special one that is handled in a different region of the brain from normal language.

English Words Make Learning Arithmetic Harder!

- How we say numbers in different languages runs the gamut from simple to complex.
- English is complex. Ten has three forms: ten, -teen, and -ty.
- Eleven and twelve fit no pattern, and the ones are stated before the tens in the numbers 13 - 19.
- The Chinese and Japanese language hold the prize for simplicity. Asian children learn to count earlier and higher than their American Wester peers.

Chinese Counting

- Nine short names for the numbers 1 through 9
- ui, er, san, si wu, liu, qi, ba, and jiu.
- The four multipliers are: 10 (shi), 100 (bai), 1,000 (quian), and 10,000 (wan).
- Composing a number past 10 is simple: shi yi, shi er, shi san, and so on.
- The same rules apply to larger numbers!

Table 4.2 A More Logical Counting System for Numbers 1 to 100

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

David Sousa,
How the Brain
Learns
Mathematics
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The Study...

- Idea
- K-2 Suburban School Reality
- 3 out of 7 Kindergarten Classes
- October to March
- Data Collection: SNAP Assessment & Anecdotal

Decisions...

- Two ways to name "teen" numbers
- Accepted either way on assessments
- Transition to Standard Form
- Only with 11 to 19

Results

- In general positive
- All teachers would do again
- BNWS
- Numeral ID
- Mid-year: Number Words and Numerals
  H-L 14/27; 14/27; 12/27; 11/27

Teacher Observations

- This strategy took away the verbal confusion with the early teen numbers and allowed all students to move through the forward rote counting easily and without hesitation and it helped facilitate the backward counting once they got the 20 to 10-9 jump.

"Many children with articulation issues have difficulty pronouncing 15, 14, 13 and it can be that much more confusing for them."

"It gave them a way to honor the 10 and say it first. There were fewer confusions with reversals (ie: 14 and 41)

"I would definitely try this strategy of counting again with my future classes. My students who experienced difficulty with rote counting after 10 seemed to pick the 10-1,10-2 sequence up very easily and they were able to begin rote counting very easily both forward and backward."

"The strongest students kept the traditional counting system "alive" within the classroom on an ongoing basis which helped everyone understand that we were talking about the same numeral, we just had 2 different ways of saying it."

"Even though some students were able to use both strategies for counting very easily and could go back and forth between the two, everyone benefitted from the use of this counting strategy when they were introduced to using the ten frames with the teen numbers. Seeing 10-1, 10-2, etc. on the 20 frame boards really seemed to help clarify exactly what those numbers meant."

Questions? Contact Us!

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