



KENTUCKY CENTER
FOR MATHEMATICS

Developing Multiplicative Thinking-

*Sequence of Multiples
with Dee Crescitelli*

Welcome!



Your host

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GOOD NEWS

KCM Launches Multi-Series Virtual PD

Find out more in this month's article!



Good News!

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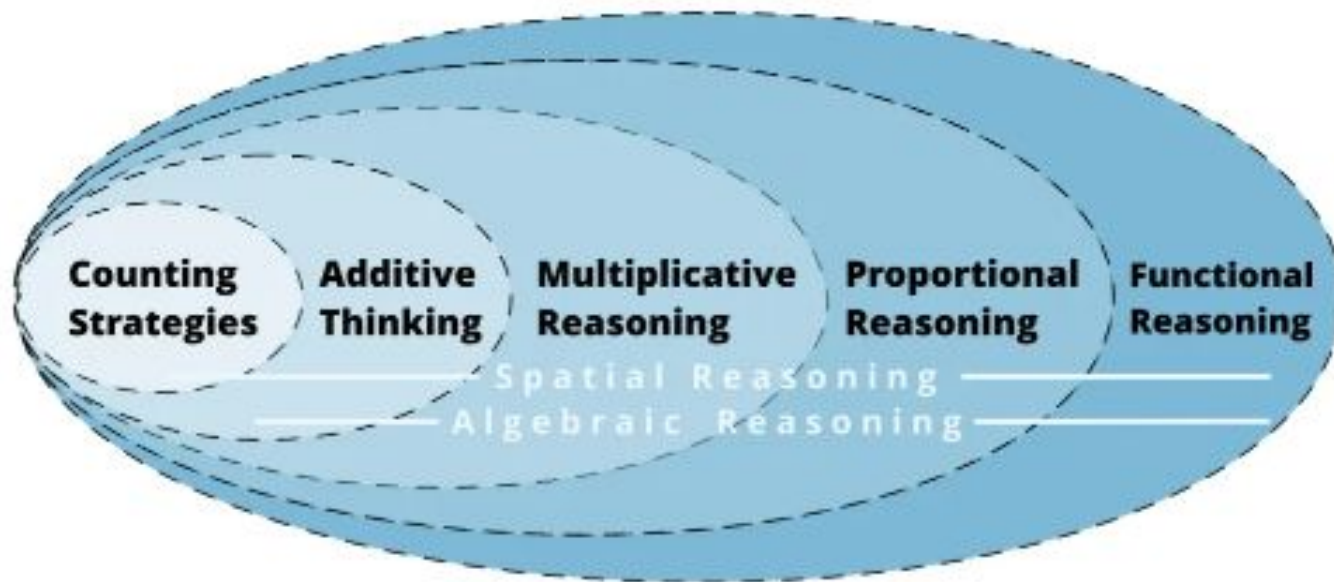
[Focus on Fractions - May 4 - May 8](#)

Today's Agenda

- Research- Progression of Mathematical Reasoning
- KY Academic Standards that build the sequences of multiples
- Foundation of Number Word Sequences

Progression of Mathematical Reasoning

The Development of Mathematical Reasoning



Development of Reasoning

Students need to develop each level of reasoning so that they can build on it for the next level.

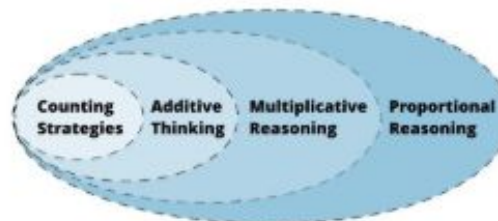
It is important for students to develop counting strategies because counting is essential in the development of additive thinking.



And additive thinking is essential for students to develop multiplicative reasoning so that they can use multiplicative strategies.



Without multiplicative reasoning, it is impossible to develop proportional reasoning, which is the land of fractions, ratios, proportions, and percents.



Standards

KY.2.NBT.2~ Forward/Backward Number Sequences

KY.2.NBT.2 Count forwards and backwards within 1000; skip-count by 5s, 10s and 100s.

MP.8, MP. 1, MP. 6

Students start at various numbers to skip-count. Some use tools such as base ten blocks, hundreds charts, number lines and money.

Coherence [KY.1.NBT.1](#)→[KY.2.NBT.2](#)

→ Count forwards and backwards within 1000; skip-count by 5s, 10s, and 100s.

KY.3.OA.9~ Identify Arithmetic Patterns

KY.3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations.

MP.3, MP.8

Students observe 4 times a number is always even and explain why 4 times a number can be decomposed into two equal addends.

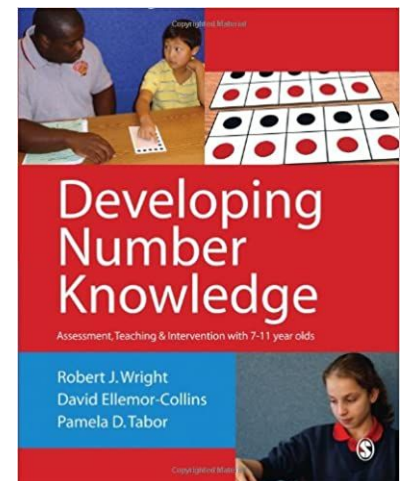
Coherence [KY.2.OA.3](#)→[KY.3.OA.9](#)→[KY.4.OA.5](#)

Number Word Sequences

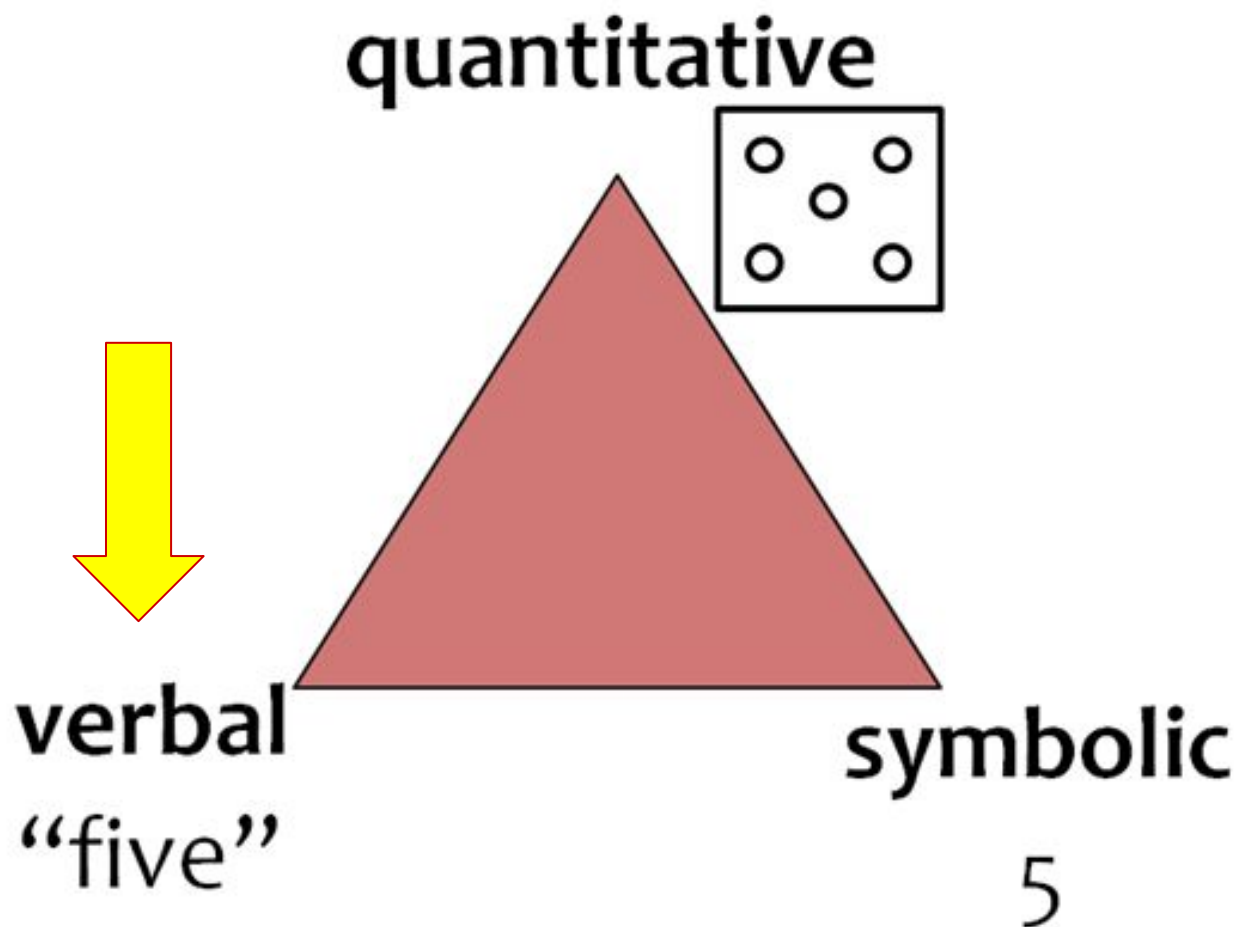
Learning number word sequences should continue beyond 1st grade.

Students need to learn:

- NWS of decuples, centuples, and 1000s
- NWS by 2s, 3s, 4s, etc, which become central to developing strategies for multiplication and division



Verbal Aspect is Important

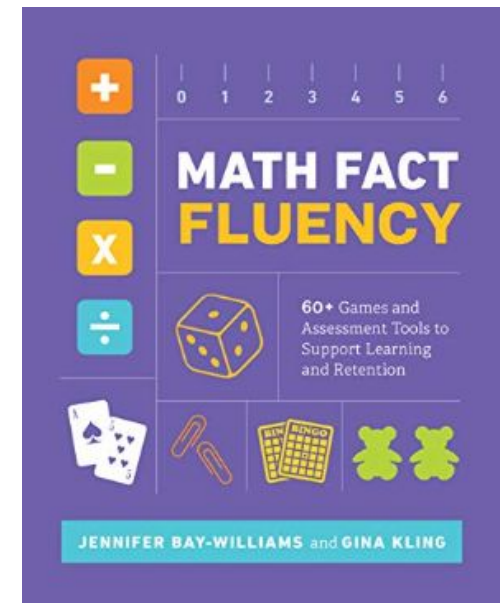


Just Do It! Don't Skip Skip-counting!

As students come to know basic facts in any operation, they progress through three phases (Baroody, 2006):

- Phase 1: Counting
- Phase 2: Deriving
- Phase 3: Mastery

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Skip-counting as Reasoning



Skip-counting as Reasoning



Activities to Build Facility with Sequences of Multiples

- Count Around
- Disappearing Sequences



Disappearing Sequences

On a scrap piece of paper, write the counting sequence that you want to practice. Make sure that you are **accurate** in your counting. For example, if you are working on counting by 2's, you would write:

2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24

Say the sequence while touching each number as you say its name. Repeat this step until you can say the sequence without hesitation. Write the sequence on the back of the paper for later reference if you get stuck.

After counting through the sequence, scratch out one number so that you can no longer read it. Count again, touching each number as you say the sequence. When you get to the number that "disappeared" touch the place where it used to be.

2, 4, 6, 8, 10, ~~12~~, 14, 16, 18, 20, 22, 24

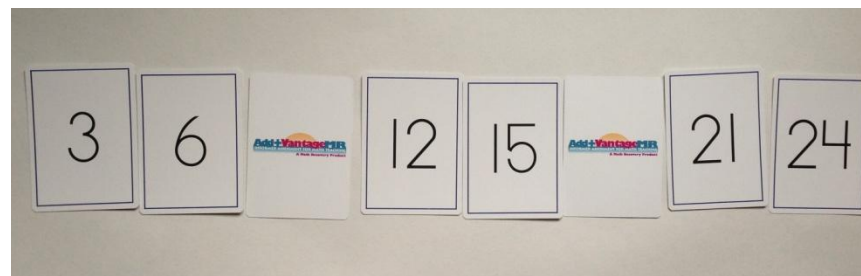
After counting, "scratch out" another number. Count again. Be sure to touch each number or space as you count.

2, 4, 6, ~~8~~, 10, ~~12~~, 14, 16, 18, 20, 22, 24

Disappearing Sequences



Other settings:
Loose Cards
numeral track



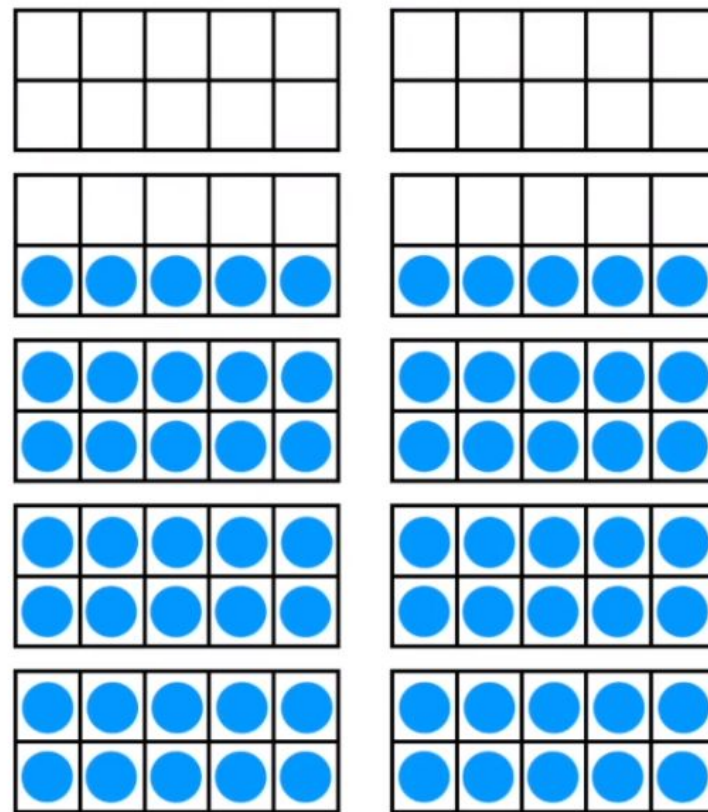
Activities to Build Facility with Sequences of Multiples

- Number Ladders

27
24
21
18
15
12
9
6
3

Activities to Build Facility with Sequences of Multiples

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



Activities to Build Facility with Sequences of Multiples

CARD GAMES:

- Junk Multiples
- Four Kings
- Quick Draw Multiples

Junk Multiples



4 Kings (AKA treasure Hunt)

3

15

27

3

9

27

3

12

27

9

27

15

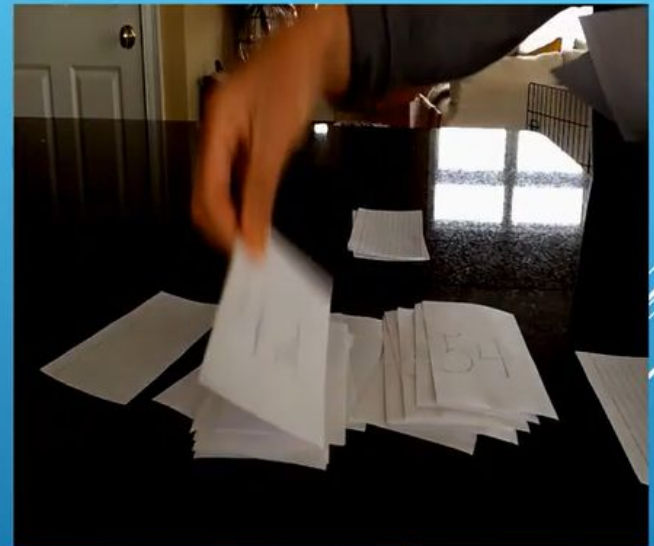
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Quick Draw Multiples

How to Play Quick Draw Multiples

- 1) Shuffle deck.
- 1) Deal 15 cards to each player. Place these cards in a stack face down in front of each player. This is each player's draw pile.
- 2) The remaining ten cards are divided into 2 stacks of 5 and placed face down between players with enough space between the stacks to turn up and display cards to start the game. These are the starter piles.
- 4) Each player draws 3 cards from their own draw pile.
- 5) At the same time, each player flips over a card from the starter piles.
- 6) A play is made from a player's hand by placing the next multiple, either forwards or backwards, on top of one of the turned up cards in the middle. Both players may play at the same time and make a series of plays, but cards may only be played one at a time. Once a card is played from a player's hand, he/she picks up another card from the draw pile so that there are 3 cards in your hand at all times. No more than three cards may be in a player's hand at a time.



resumes.

8. The first player that uses all cards from their individual draw pile wins.

Upcoming Sessions

APRIL 27 - MAY 1
2:00-2:30 PM EST



Developing Multiplicative Thinking!

w/ KY Math Leaders

Monday, April 27 - Foundations of Multiplicative Thinking

Tuesday, April 28 - Sequence of Multiples

Wednesday, April 29 - Structuring Numbers Multiplicatively

Thursday, April 30 - Developing Multiplication Strategies

Friday, May 1 - Monitoring and Assessing Multiplication

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