LEVELS OF COUNTING STRATEGIES:

ADDITION, SUBTRACTION, MULTIPLICATION AND DIVISION

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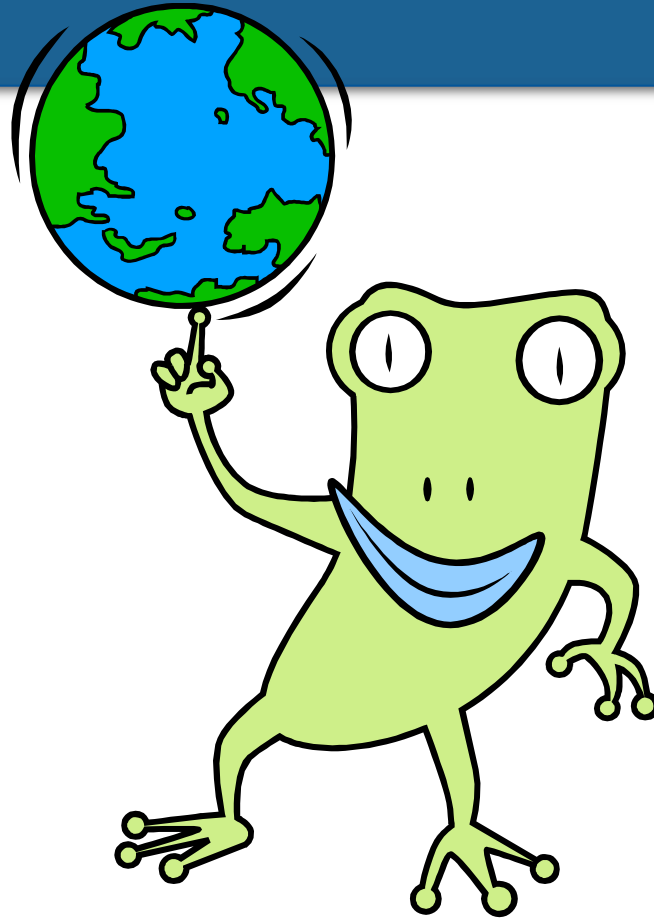# Source Document

❖ K-5 Progression on Counting and Cardinality & Operations and Algebraic Thinking

http://ime.math.arizona.edu/progressions/

We're Not in Kansas...

❖ What am I teaching?

❖ Why is this important?

Levels of Counting Strategies

❖ Level 1- Count All

❖ Level 2- Count On

❖ Level 3- Recompose

http://ime.math.arizona.edu/progressions/

Level 1 Count All

❖ 8 + 6 = 14

(page 36 of the progressions document)

Level 1 Count All

❖ 14 - 8 = 6

(page 36 of the progressions document)

Level 2 Count On

❖ 8 + 6 = 14

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Level 2 Count On

❖ 14 - 8 = 6

(page 36 of the progressions document)

Level 3 Recompose

❖ $8 + 6 = 14$

(page 36 of the progressions document)

Level 3 Recompose

❖ 14 - 8 = 6

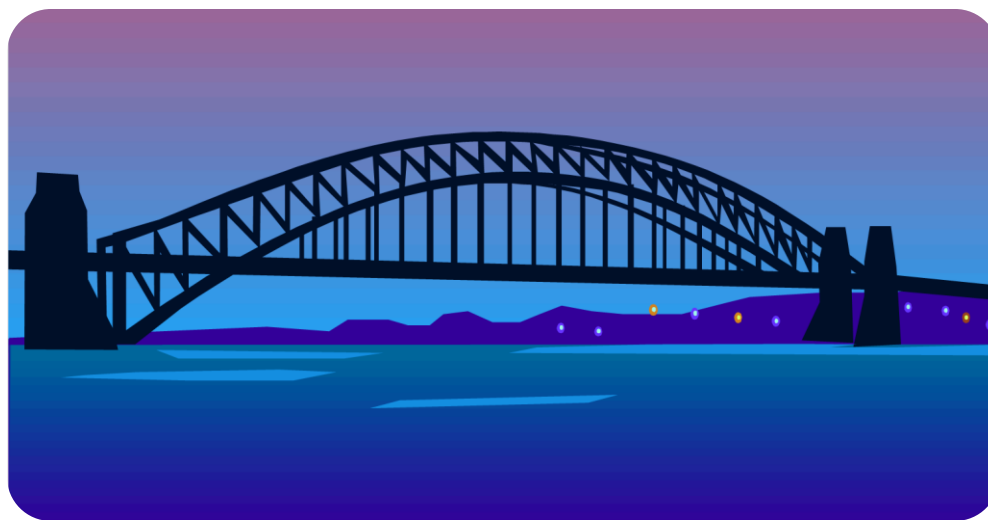(page 36 of the progressions document)

Moving Beyond Level 1

❖ Can we assume all students will make the leap independently?

Moving Beyond Level 1

❖ Building a Bridge to Level 2 and Level 3 Strategies

Teaching Level 2- Count On

❖ Count on from 5 (GK.M4.L7)

❖ Count on from 10 (GK.M5)

    ❖ Kindergarten Example in EngageNY Video Library

❖ Count on to add within 10 (G1.M1.TD)

Teaching Level 2- Count On

❖ G1.M1.L6 Represent put together situations with number bonds. Count on from one embedded number or part to totals of 8 and 9 and generate all addition expressions for each total.

Teaching Level 2- Count On

❖ G1.M1.L26 Count on using the number path to find an unknown part.

An opportunity to learn…

❖ Relationship between addition and subtraction.

Teaching Level 3- Recompose

❖ Make a 10

❖ Take from a 10

Level 3- Prerequisite Skills

❖Knowing the partner that makes 10 for any number (K.OA.4)

❖Knowing all decompositions for any number below 10 (K.OA.3)

❖Seeing teen numbers as 10 + n (K.NBT.1)

Teaching Level 3- Recompose

❖ Make a 10 (G1.M2)

❖ Take from a 10 (G1.M2)

Teaching Level 3- Recompose

❖ G1.M2.L1 Solve word problems with three addends, two of which make a 10.

Teaching Level 3- Recompose

❖ G1.M2.L4 Sprint- Reviewing make a 10 with 3 addends.

Teaching Level 3- Recompose

❖ G1.M2.L4 Make a 10 when one addend is 9.

Teaching Level 3- Recompose

❖ G1.M2.L14 Model subtraction of 9 from teen numbers.

Teaching Level 3- Recompose

❖ G1.M2.L16 Relate counting on to making ten and taking from ten.

An Opportunity to Learn

❖ Completing the "unit"

❖ Decompose and recompose

   ❖ Commutative and Associative Property

Levels of Multiplication

❖ Level 1- Count All

❖ Level 2- Count By

❖ Level 3- Recompose

(page 25 of the progressions document)

Level 1- Count All

❖ 2.OA.3 Determine whether a group of objects (up to 20) has an odd or even number of members by pairing objects or counting them by 2's, write an equation to express an even number as a sum of two equal addends.

Level 1- Count All

❖ 2.OA.3 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

Level 2- Count By

❖ Repeated counting on by a given number.

$$8 \times 3 = 24$$

An Opportunity to Learn

❖ The relationship between

   ❖ addition and multiplication

   ❖ multiplication and division

Level 3- Recompose

❖ Associative and Distributive Property.

$$4 \times 6 = 24$$

Teaching Level 3- Recompose

❖ G3.M3.L9 Model the associative property as a strategy to multiply.

Teaching Level 3- Recompose

❖ G3.M3.L10 Use the distributive property as a strategy to multiply and divide.

Teaching Level 3- Recompose

❖ G3.M4.L10 Apply the distributive property as a strategy to find the total area of a large rectangle by adding two products.

An Opportunity to Learn

❖ The properties of operations
  ❖ associative property
  ❖ distributive property
  ❖ commutative property

Fluency- Dual Intensity

Grade	Standard	Fluency
K	K.OA.5	Add/subtract within 5
1	1.OA.6	Add/subtract within 10
2	2.OA.2	Add/subtract within 20
	2.NBT.5	Add/subtract within 100
3	3.OA.7	Multiply/divide within 100
	3.NBT.2	Add/subtract within 1,000
4	4.NBT.4	Add/subtract within 1,000,000
5	5.NBT.5	Multi-digit multiplication
6	6.NS.2,3	Multi-digit division Multi-digit decimal operations

A Challenge…

❖ Look for the levels of strategies in the lessons.

❖ Which levels do you see when your students attack an unfamiliar problem?