



I've tested my kids
with GLoSS/IKAN....

Now what?

Krystal Shaw
Math Instructional Lead Teacher
Rocky Creek Elementary
kshaw@henry.k12.ga.us

Adapted from a presentation by Mollie Hall,
MILT, LGE



Where are You?



1. I'm lacing up.
2. I'm out of the starting gate.
3. I'm gaining speed.
4. I've caught the runner's high!





TODAY'S GOALS...

1. How do I analyze the data provided by GLoSS/IKAN?
2. How do I expose students to appropriate strategies to help students grow from one stage to another between assessments?
3. What are the answers to the frequently asked questions that come up when administering this assessment?

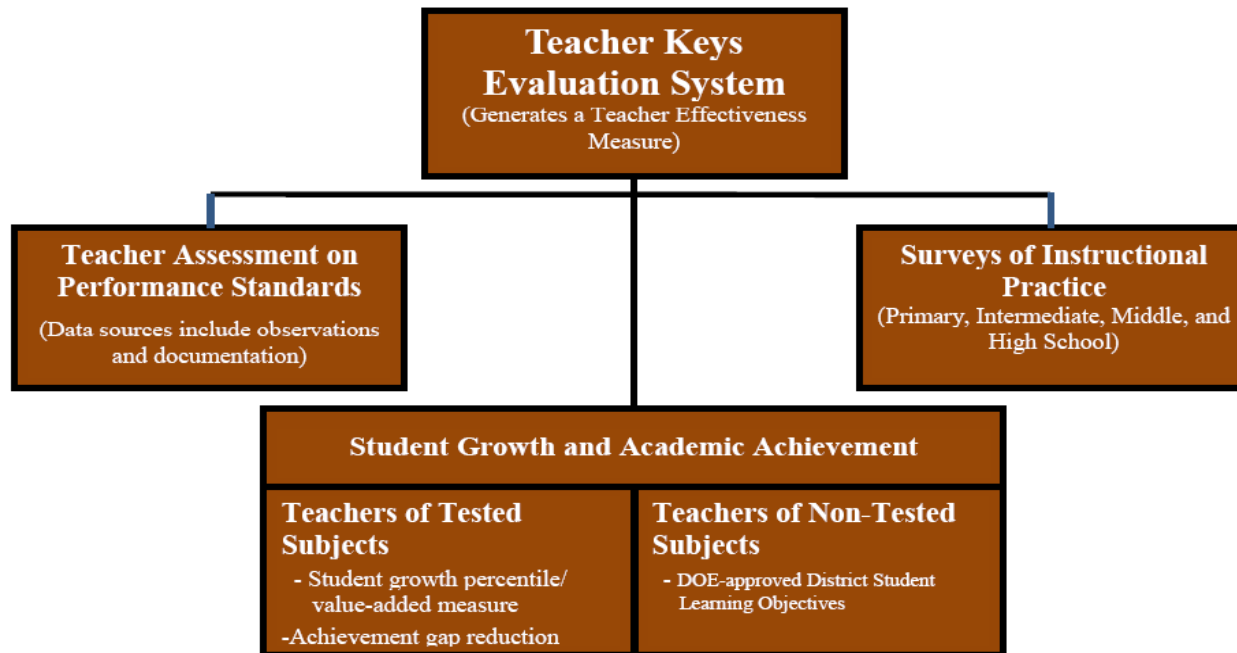


TKES Standards

- 1. Professional Knowledge:
 - The teacher demonstrates an understanding of the curriculum, subject content, pedagogical knowledge, and the needs of students by providing relevant learning experiences.
- 3. Instructional Strategies:
 - The teacher promotes student learning by using research-based instructional strategies relevant to the content to engage students in active learning and to facilitate the students' acquisition of key knowledge and skills.
- 4. Differentiated Instruction:
 - The teacher challenges and supports each student's learning by providing appropriate content and developing skills which address individual learning differences.



For you: Benchmarking that is tied to Teacher Keys



Student Growth and Academic Achievement:

- For teachers of tested subjects, this component consists of a student growth percentile/value-added measure. (CRCT scores for 4-5)
- For teachers of non-tested subjects, this component consists of GaDOE-approved Student Learning Objectives (SLO) utilizing district-determined achievement growth measures. (In Henry County, GLoSS/IKAN for K-3)



For your Students

CCGPS Standards in GLoSS/IKAN

Kindergarten

- MCCK.CC.1 - 4
- MCCK.OA.1 - 3
- MCCK.OA.5
- MCCK.NBT.1

First Grade

- MCC1.OA.5 - 6
- MCC1.NBT.1
- MCC1.NBT.4 - 5

Second Grade

- MCC2.OA.1 - 2
- MCC2.NBT.3
- MCC2.NBT.5 - 9

Third Grade

- MCC3.NBT.1 - 3
- MCC3.OA.5
- MCC3.OA.7
- MCC3.NF.1 - 3

Fourth Grade

- MCC4.OA.1 - 5
- MCC4.NBT.1
- MCC4.NBT.4 - 6
- MCC4.NF.1

Fifth Grade

- MCC5.NBT.3
- MCC5.NBT.5 - 7
- MCC5.NF.1 - 7



How Do I Analyze The Data?



Recording Sheet– GloSS Form

Beg Mid End

E H I (circle as appropriate)

Name: _____

Year Level: _____

Date: _____

Stage Summary

Addition and Subtraction	0	1	2	3	4	5	6	7	8
Multiplication and Division				3	4	5	6	7	8
Ratios and Proportions					4	5	6	7	8
Global Stage for Expectations (Highest on any domain)									

Follow the instructions on the corresponding GloSS form, and circle the strategy stage at which you rate the student. Briefly record the strategies shared by the student in the space provided. When a student has reached the Advanced Counting stage, numeracy stage 4, or higher he/she should proceed to complete the IKAN Written Assessment (Part II). If a student has not reached the Advanced County stage (Stage 4), you should administer the IKAN Counting Interview (Part I).

Task 1 – Add / Sub Stage 1?

Observations:

Decision: Stage 0 / Go on

Task 2 – Add / Sub Stage 2/3?

Observations:

Decision: Stage 1 Stage 2 Go On

Strategy Stage



IKAN - Counting Interview



Individual Knowledge Assessment for Numeracy (IKAN) Part I

Name: _____

Counting Students (Interview)

*for students scoring within Strategy Stage 0 - 3

Look for confusions between "teen" and "ty" numbers in questions (1), (3), and (7) to (9) and for "dropping back" to find the numbers after and before.

(1) Start counting from 1. Stop at 32.

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,

(2) Count backwards from 10. Stop at 0.

10,9,8,7,6,5,4,3,2,1,0

(3) Count backwards from 23. Stop at 11.

23,22,21,20,19,18,17,16,15,14,13,12,11

Show each number (on card). For each number ask:

Questions:	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Show Card #	1	5	11	14	31	50	80	100	111	409	870	999
What is this Number?												
What Number comes after?												
What number comes before?												

record dates achieved FNWS/BNWS/R&S in table below

Record dates achieved FNWS/BNWS/R&S	(K) R&S to 20	(1 st Grade) R&S to 120	(2 nd Grade) R&S to 1000
FNWS- BNWS- recognition to- after before to-	FNWS- BNWS- Number recognition to- Number after and before to-	Number recognition to- Number after and before to-	Number recognition to- Number after and before to-

FNWS/BNWS- Forward and Backward Number with Sequence

R&S-recognition and Sequence

Adapted from *ezmaths*

Number Knowledge Stage



IKAN - Written Part



Student Answer Sheet – IKAN

Beg IKAN 1 Mid IKAN 2 End IKAN 3 Advanced Placement IKAN 4 (Circle the form used)

Student Name: _____

Year Level: _____

Date: _____

	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional	
Domain	Part One	Part Two	Part Three	Part Four	Part Five	Stage
Number Sequence and Order	1.	1.	1.	1.		
	2.	2.	2.	2.		
Fractions	3.	3.	3.	3.	1.	
	4.	4.	4.	4.	2.	
Place Value	5.	5.	5.	5.	3.	
	6.	6.	6.	6.	4.	
Basic Facts	7.	7.	7.	7.	5.	
	8.	8.	8.	8.	6. 7. 8.	
Total						

Number Knowledge Stage



Global Stage

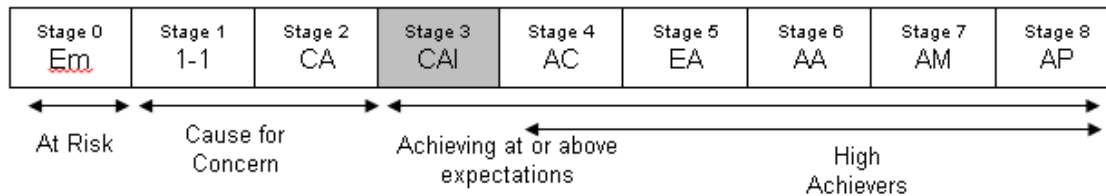
- Be mindful that students' strategy stages across the three domains may be out of phase.
 - For example, a student might be at stage 5 for both the addition and subtraction and the proportions and ratios domains and at stage 6 for multiplication and division. This student understands how to derive multiplication facts but lacks the addition and subtraction strategies to do so efficiently and has insufficient knowledge to apply multiplicative thinking to fractions.
- Your initial focus is likely to be on number knowledge, addition, and subtraction, so assign the student to their stage for that domain.



Henry County Expectations

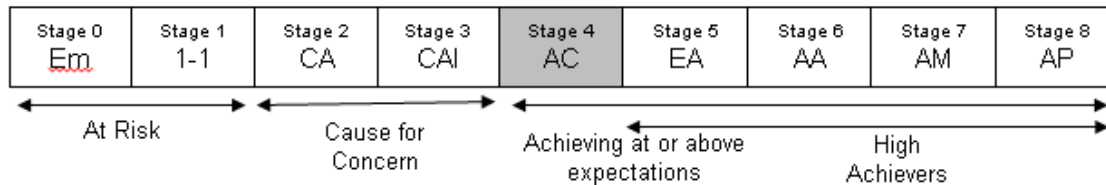


End of Kindergarten Mathematics Strategy Expectations



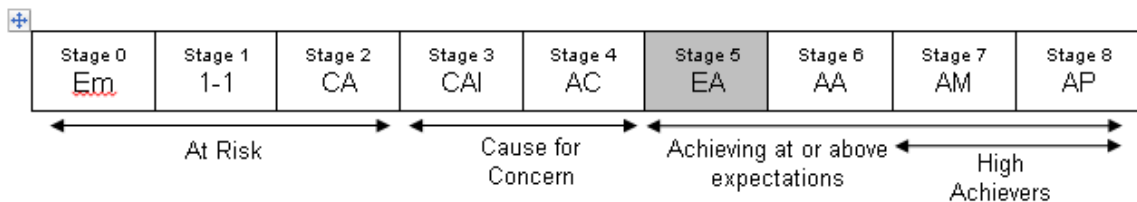
Stage 3: Counting from one by Imaging

End of 1st Grade Mathematics Strategy Expectations



Stage 4: Advanced Counting

End of 2nd Grade Mathematics Strategy Expectations



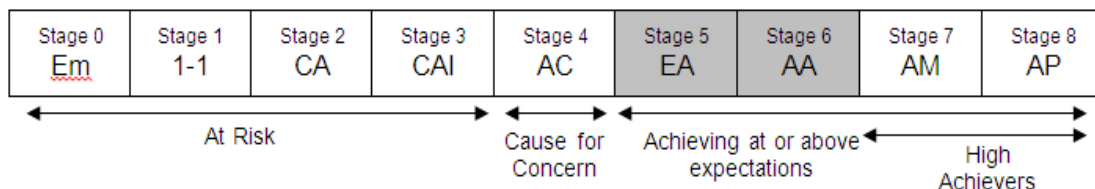
Stage 5: Early Additive

All students must show growth from the beginning to the end of the year.



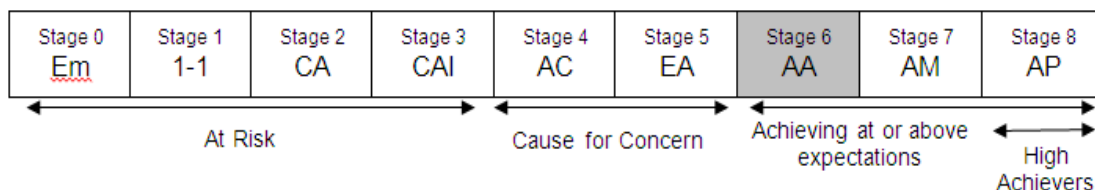
Henry County Expectations

End of 3rd Grade Mathematics Strategy Expectations



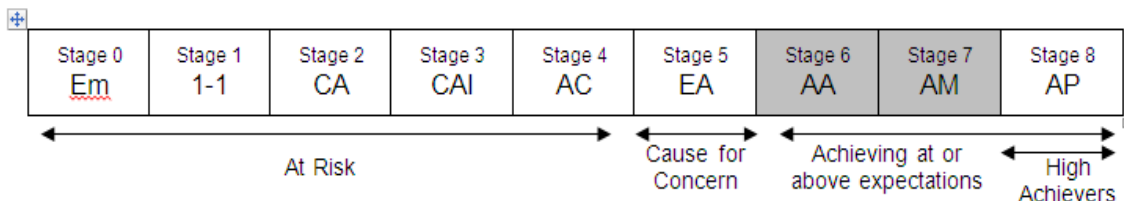
Stage 5/6: Early Additive Part Whole or Advanced Additive/Early Multiplicative Part-Whole

End of 4th Grade Mathematics Strategy Expectations



Stage 6: Advanced Additive/Early Multiplicative Part-Whole

End of 5th Grade Mathematics Strategy Expectations



Stage 6/7: Advanced Additive/Early Multiplicative Part-Whole

All students must show growth from the beginning to the end of the year.



Goal #2

How do I expose students to appropriate strategies to help students grow from one stage to another between assessments?





Grouping options

- Most classes display a wide range of strategy stages. This can be managed in many ways, including:
 - Putting together students from close strategy stages
 - Cross-grouping between classes for a few students at the extreme ends of the range
 - Using parent or teacher aide to help monitor group or independent work.



Grouping Strategies

GLOSS Stages

	<u>Stage 0</u> Emerging (EM)	<u>Stage 1</u> One to One Counting (1-1)	<u>Stage 2</u> Counting From One on Materials (CA)	<u>Stage 3</u> Counting From One by Imaging (CAI)	<u>Stage 4</u> Advanced Counting (AC)	<u>Stage 5</u> Early Additive Part- Whole Thinking (EA)	<u>Stage 6</u> Advanced Additive Part- Whole Thinking (AA)	<u>Stage 7</u> Advanced Multiplicative Part Whole (AM)	<u>Stage 8</u> Advanced Proportional Part Whole (AP)
Global Stage (Highest on any domain)									
Addition and Subtraction									
Multiplication and Division									
Ratios and Proportions									



Students' Learning

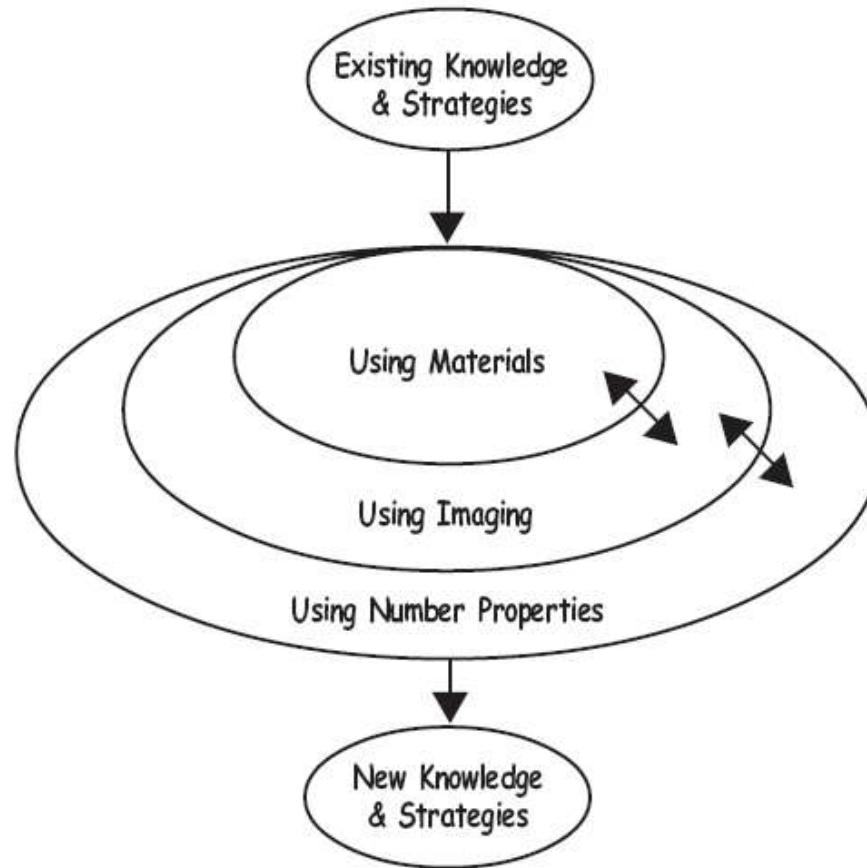
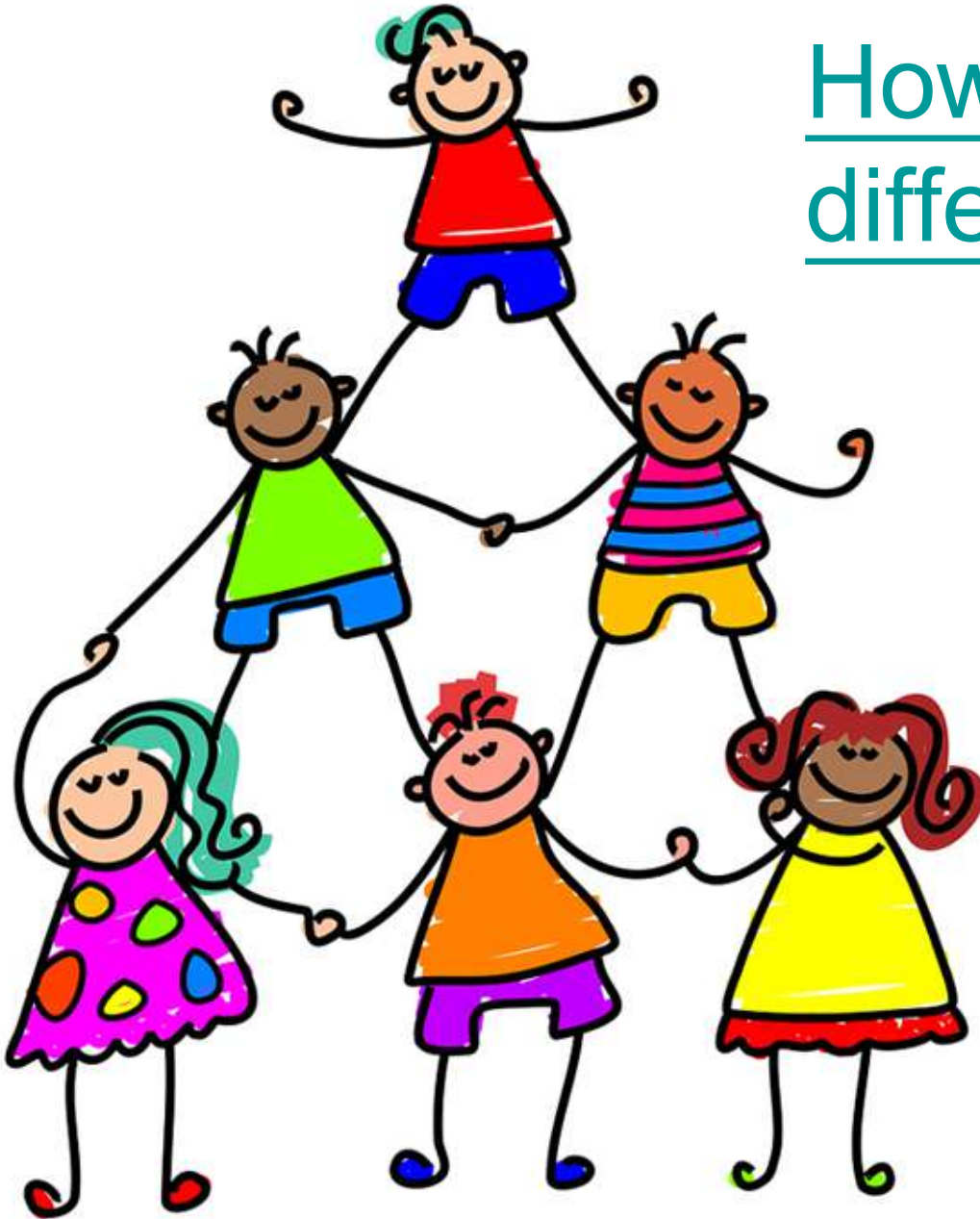
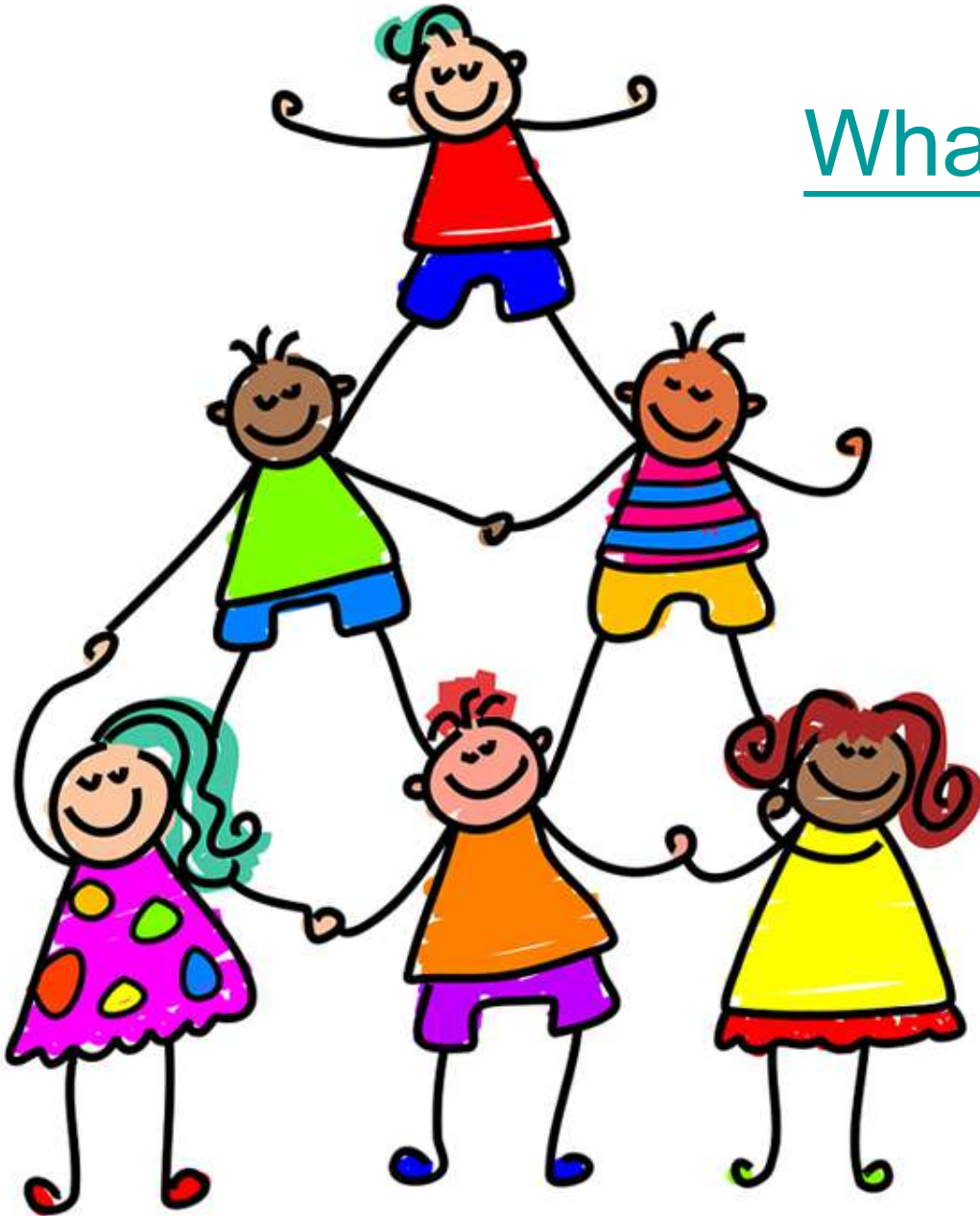


FIGURE 1

How do I teach the different stages?



What if I don't know?





Lesson Activities from the Books



Numeracy Development Projects Books

Book Name	Date Updated	File size (KB)
Book 1: The Number Framework	7 Dec 11	PDF 698
Book 2: The Diagnostic Interview	17 Mar 08	PDF 788
Book 3: Getting Started	17 Mar 08	PDF 464
Book 4: Teaching Number Knowledge	17 Mar 08	PDF 570
Book 5: Teaching Addition, Subtraction and Place Value	12 Jul 12	PDF 404
Book 6: Teaching Multiplication and Division	17 Mar 08	PDF 1311
Book 7: Teaching Fractions, Decimals and Percentages	13 May 08	PDF 1340
Book 8: Teaching Number Sense and Algebraic Thinking	17 Mar 08	PDF 569
Book 9: Teaching Number through Measurement, Geometry, Algebra and Statistics	13 Aug 07	PDF 888
Enriching the Number Framework with BSM	17 Mar 08	PDF 1117
Home-School Partnership: Numeracy Handbook	1 Aug 08	



Stages/Stage Names

<u>Stage 0</u> Emerging (EM)	<u>Stage 1</u> One to One Counting (1-1)	<u>Stage2</u> Counting From One on Materials (CA)	<u>Stage 3</u> Counting From One by Imaging (CAI)	
<u>Stage 4</u> Advanced Counting (AC)	<u>Stage 5</u> Early Additive Part-Whole Thinking (EA)	<u>Stage 6</u> Advanced Additive Part- Whole Thinking (AA)	<u>Stage 7</u> Advanced Multiplicative Part Whole (AM)	<u>Stage 8</u> Advanced Proportional Part Whole (AP)



Examples : Book 5

Learning experiences for emergent and one-to-one counting	10
Introduction	10
Counting principles	10
Learning experiences	10
Key idea 1: Symbols/words for numbers in the range 1–10 are identified	11
Key idea 2: The number word sequence for numbers in the range 1–10 is said accurately	12
Key idea 3: The symbols/words for numbers in the range 1–10 are matched to the number of objects in the set	13
Key idea 4: The sequence of numbers in the range 1–10 is ordered correctly	14
Key idea 5: Patterns for numbers 1–5 are recognised instantly	15



Examples Book 5:



Key idea 1: The number of objects in a set stays the same, regardless of spatial arrangement

Mathematical knowledge required

Students need to be able to:

- rote count fluently from one to ten
- read one to ten in words and 1 to 10 as numerals.

Diagnostic snapshot

There are five dogs in their kennels at the vet's. Two of the dogs come out of their kennels to have a drink of water. How many dogs are there at the vet's?

Students who understand that there are still five dogs at the vet's are ready to move on to the next key idea. Otherwise, the following learning experiences will develop the idea.



Examples: Book 5

Learning experiences

■ Animals on the farm

Use the copymasters from the unit *Counting on Counting*, found at www.nzmaths.co.nz

Equipment: Plastic farm animals; paper divided into two rectangles (representing paddocks on a farm).

Using materials

There are eight farm animals on the farm. How many different ways could the farmer split the animals between the two paddocks?

Show the students the eight plastic farm animals and a piece of paper with two rectangles drawn on it to represent two paddocks. Let the students take the animals for a walk around the paddocks until "Stop" is called. Ask: "How many animals are in the first paddock, and how many are in the second paddock?"

Discuss the result – for example, three animals and five animals is the same as eight animals – and record it on the board or in the modelling book. Continue to explore numbers from two to ten.

Using imaging

There are six cows on the farm. Two of the cows are in the first paddock, and four are in the second paddock.

Show the two cows and the four cows, and then cover the four cows with a green piece of material. Say: "One of the sleeping cows got hungry and joined her friends eating grass. How many cows are there on the farm altogether?"

The students solve the problem by imaging the cow moving to the first paddock. If necessary, have the students fold back to "Using materials" by moving one cow to the other paddock and counting how many cows there are altogether. Discuss why two cows and four cows is the same as three cows and three cows and record on the board or in the modelling book.

Continue to explore numbers from two to ten.



Examples: Book 6

Strategy Stage/s	Knowledge and Key Ideas	Multiplication	Division
Counting from One by Imaging to Advanced Counting	Pages 7–8	Pages 8–10	
Advanced Counting to Early Additive	Pages 11–12	Pages 12–16, 21–23	Pages 17–20
Early Additive to Advanced Additive–Early Multiplicative	Page 24–25	Pages 25–38	Pages 38–40
Advanced Additive–Early Multiplicative to Advanced Multiplicative–Early Proportional	Pages 41–43	Pages 43–48, 49–54, 67–70, 73–75	Pages 43–48, 54–67, 70–72
Advanced Multiplicative–Early Proportional to Advanced Proportional	Page 76	Pages 76–79	Pages 76–79



Examples: Book 6

Learning Experiences to Move Students from
Advanced Counting to Early Additive Part-Whole

Required Knowledge

Before attempting to develop their ideas about multiplication and division, check that Advanced Counting students have the following knowledge.

Key Knowledge	Questions for Key Knowledge
Forwards and backwards skip-counting sequences in twos, fives, and tens at least	Use the addition and subtraction constant function on a calculator to generate skip-counting sequences. Keying in $+ 5 = = = =$ produces the counting sequence in fives. Mark the multiples using transparent counters on a student hundreds board. Encourage the students to predict how many times $=$ must be pressed to get to target numbers, like 35. Turn over multiples on the hundreds boards and look for symmetrical patterns in the multiples. For example, multiples of five form a vertical pattern, and multiples of three form a diagonal pattern. Ask the students to explain why they think the patterns occur, e.g., five divides evenly into 10.

E

CA

AC

EA

AA

AM

AP



Examples: Book 6

Knowledge to be Developed

While students at the Advanced Counting stage are developing their ideas about multiplication and division, it is essential that they have the following knowledge as a focus:

- Skip counting in threes – see page 1 of Planning Sheet AC to EA (Mult and Div) www.nzmaths.co.nz/numeracy/Planlinks/MultPlannerAC-EA.pdf
- Learning multiplication and division facts for 2, 5, and 10 times tables – see page 2 of Planning Sheet EA to AA (www.nzmaths.co.nz/numeracy/Planlinks/MultPlannerEA-AA.pdf) and page 2 of AC to EA (Mult and Div)

Key Ideas

Students at the Advanced Counting stage are learning to use addition strategies to solve problems that could be solved by multiplication and division. For example, given four sets of five, to find the total number, they may add five and five to get 10 and then add 10 and 10. These students are learning to form the numbers (factors) to multiply and divide by for these situations.

It's important that the students learn the connection between multiplication and repeated addition, for example, 5×4 is the same as $4 + 4 + 4 + 4 + 4$, and that changing the order of the factors gives the same result, for example, $5 \times 4 = 4 \times 5$ or $5 + 5 + 5 + 5$. Students need to know why this commutative property is true and to have generalised this property to relate to larger numbers, e.g., $3 \times 99 = 99 \times 3$.

The students also need to understand two different types of division situations. These two types are equal sharing, as in 12 lollies shared between four people, and measuring, as in 12 lollies put into sets (or bags) of three.



E
CA
AC
EA
AA
AM
AP

Twos, Fives, and Tens

I am learning to work out multiplication facts from what I know about twos, fives, and tens.

Key Mathematical Ideas

- Students learn how to derive the two times tables from the doubles, e.g., $7 + 7 = 2 \times 7$.
- Students learn how to link the 10 times table from their knowledge of the “ty” words, e.g., 6×10 is the same as sixty.
- Students learn how to derive the five times table from the tens by doubling and halving.

Students who, by the end of the lesson, have demonstrated that they are able to derive the twos, fives, and tens will require opportunities to repeatedly practise the facts until quick recall has been achieved.

Key Mathematical Knowledge

Check that the students know:

- the doubles, e.g., $7 + 7 = 14$
- how many tens in a decade, e.g., “How many tens are in 50?”
- the skip-counting sequence for fives and tens, e.g., 5, 10, 15, ...

Diagnostic Snapshot

Check whether the students already know the 2, 5, and 10 times tables. If they already have this knowledge and can convert it to equal-acts problems such as “Six acts of five is how many altogether?”, they need to be extended.

The reading activity, shown below as Using Strings, can be used as the main activity or as a last check.

Equipment: Stringed abacus

Using Materials

Tell the students that they already know a lot of their multiplication (times) tables. This may surprise them, but indicate that you are going to prove it.

Move two strings of seven across on the bead frame. Ask “How many beads have I moved?” “How do you know?”

The students will reply that the answer is 14, since double seven beads have been moved. Tell them that 14 is also the answer to “two times seven.” Record the operations as addition and multiplication expressions:



$7 + 7$ is the same as 2×7 (two rows of seven).

Provide similar examples connecting doubles with the two times table and recording the related expressions using symbols. Do this in sequence and ask the students to predict the missing members of the pattern.

$3 + 3$ is the same as $2 \times 3 = 10$

What is 2×6 ?

$7 + 7$ is the same as $2 \times 7 = 14$

$5 + 5$ is the same as $2 \times 5 = 10$

What is 2×9 ?



Examples: Book 6

Using Imaging

Act-playing: Send a student behind a screen with a bead frame. Ask them to move over beads that match the operation you give. For example:

"Tipone, make two times eight for me, please."

Ask the other students to explain what Tipone has done and tell you how many beads have been moved. Record the operations using equations, for example, $2 \times 8 = 16$. Tipone can be asked to confirm the students' ideas.

Provide many examples to illustrate the connections between the two, five, and ten times tables. Examples might be:

"Make double nine. What is two times nine?"

"Make five times 10. What "-ty" number is that?"

"Make 10 times seven. What "-ty" number has the same answer?"

"Make four times 10. How many fives is that?"

Using Number Properties

Provide written examples that are outside the number range of the bead frame problems the students have encountered. For example:

2×21	2×30	2×20	2×100	2×300	2×25
10×11	12×10	20×10	100×10	15×10	25×10
10×5	5×40	12×5	5×30	15×5	13×5

The students should be encouraged to realize that the times five problems can be solved by doubling and halving:

12×5 : double five to make 10, and halve 12 to get $6 \times 10 = 60$.

Figure It Out activities to reinforce students' knowledge of the 2, 5, and 10 times tables include Number: Book Two, Level 2, page 13 (Double Trouble) and Number Sense: Book One, Years 7–8, page 9 (Flying Feet).

E
CA
AC
EA
AA
AM
AP

The students identify success through using Number Properties. Understand, they proceed at the same way as about last time.



The Resource Finder



Resource Finder

Welcome to the nzmaths Resource Finder.

Use this section of the site to browse our mathematics learning resources.

Login or sign up for a free account, and you can save collections of resources for lesson planning. Please read the [Help File](#) for information on how to create plans.

Browse Resources by Achievement Objective

Use Curriculum Levels | [Use Numeracy Stages](#)

Select which resource type(s) you are looking for:

- ☒ Units of Work
- ☒ Problem Solving Activities
- ☒ Numeracy Activities
- ☐ Figure It Out Activities
- ☐ Secondary Activities

Select a Level:

Select a Strand:

Select an Achievement Objective:



Digital Learning Space

Digital Learning Objects

Select a strand or level from the table below to display the related Learning Objects. Choosing a cell from within the table will display the Learning Objects at that strand AND level.

	<u>Algebra</u>	<u>Geometry</u>	<u>Measurement</u>	<u>Number</u>	<u>Statistics</u>
<u>Level 1</u>					
<u>Level 2</u>					
<u>Level 3</u>					
<u>Level 4</u>					
<u>Level 5</u>					



Let's Look at Some Activities

- Beep
- Hundred Board Snakes
- The Birthday Cake





Birthday Cakes - Using Materials

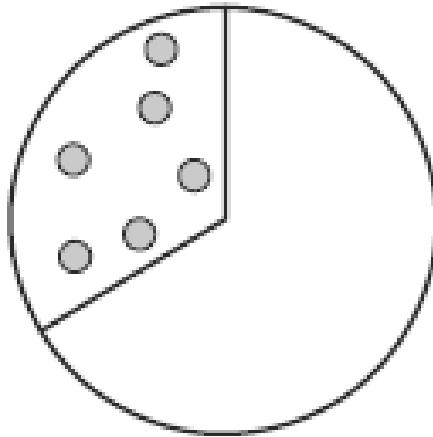
The four people at Carla's birthday will get one-quarter (one-fourth) of the cake each. Carla puts 16 candles on the cakes so that each person gets the same number of candles on their piece of cake. How many candles will each person get on their piece of cake?



Birthday Cakes - Using Imaging

Here is a piece of Randy's birthday cake. Each piece of cake has the same number of candles. How old is Randy?

One piece of cake



$\frac{1}{3}$ of is 6



Birthday Cakes - Using Number Properties

Two-thirds of the cake has eight candles on it. How many candles are on the whole cake?

$\frac{2}{3}$ of $\square$ is 8, so $\square$ is 12.

Three-quarters of the cake has nine candles on it. How many candles are on the whole cake?

$\frac{3}{4}$ of $\square$ is 9, so $\square$ is 12.



We are Kindergarten, 1st and 2nd grade teachers....what does it matter?

A good understanding of addition, subtraction, and place value is crucial for strategies in multiplication, division, fractions, algebra, and statistics. Students initially use counting to solve addition and subtraction problems. They then start to think strategically, first with smaller whole numbers, then with larger ones, and later with fractions, decimals, and integers.

We are the foundation builders for our students.



Goal # 3

What are the answers to the frequently asked questions that come up when administering this assessment?





Frequently Asked Questions

- [Math / IKAN/GLOSS Teacher Resources](#)





3, 2, 1

3 things you learned today
2 things that connected for you
1 question you still have

kshaw@henry.k12.ga.us