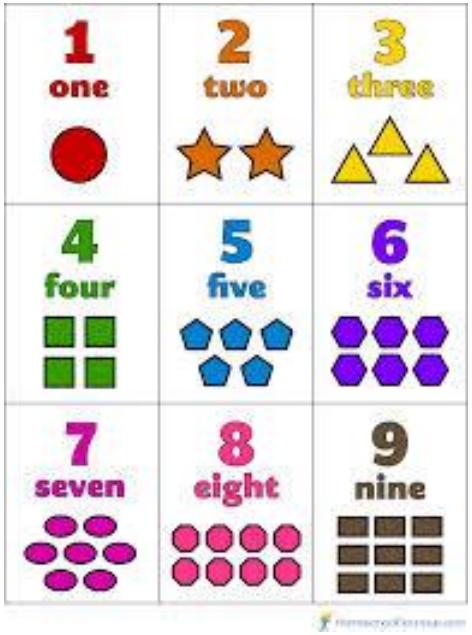
Using Numbers to Represent Quantities; Identifying and Describing Shapes

Kindergarten – Quarter 1



Big Rocks for 2014-2015

Understanding the Standards

Scoring to the Standards

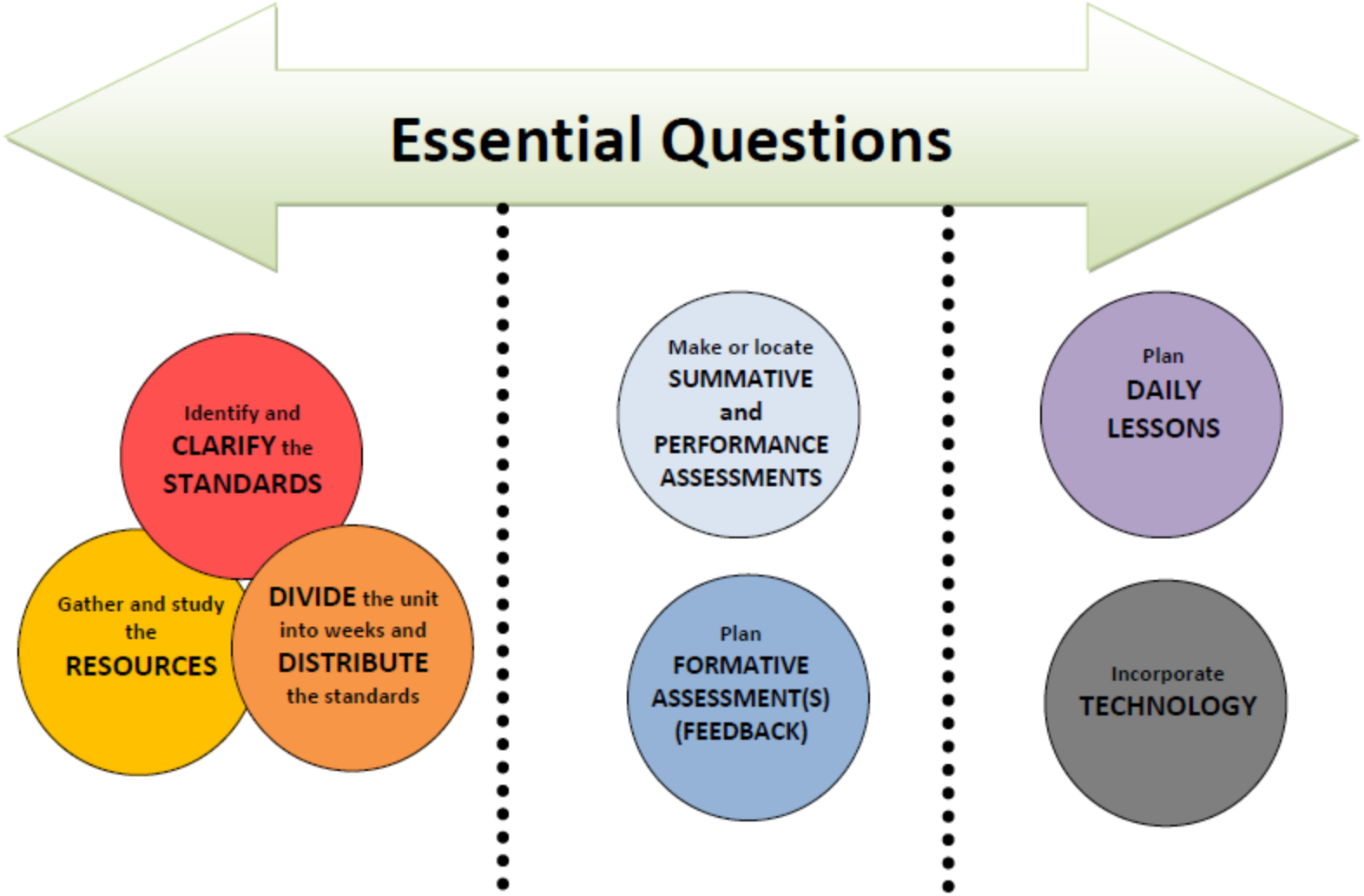
Vocabulary

GANAG/CGI & ECM

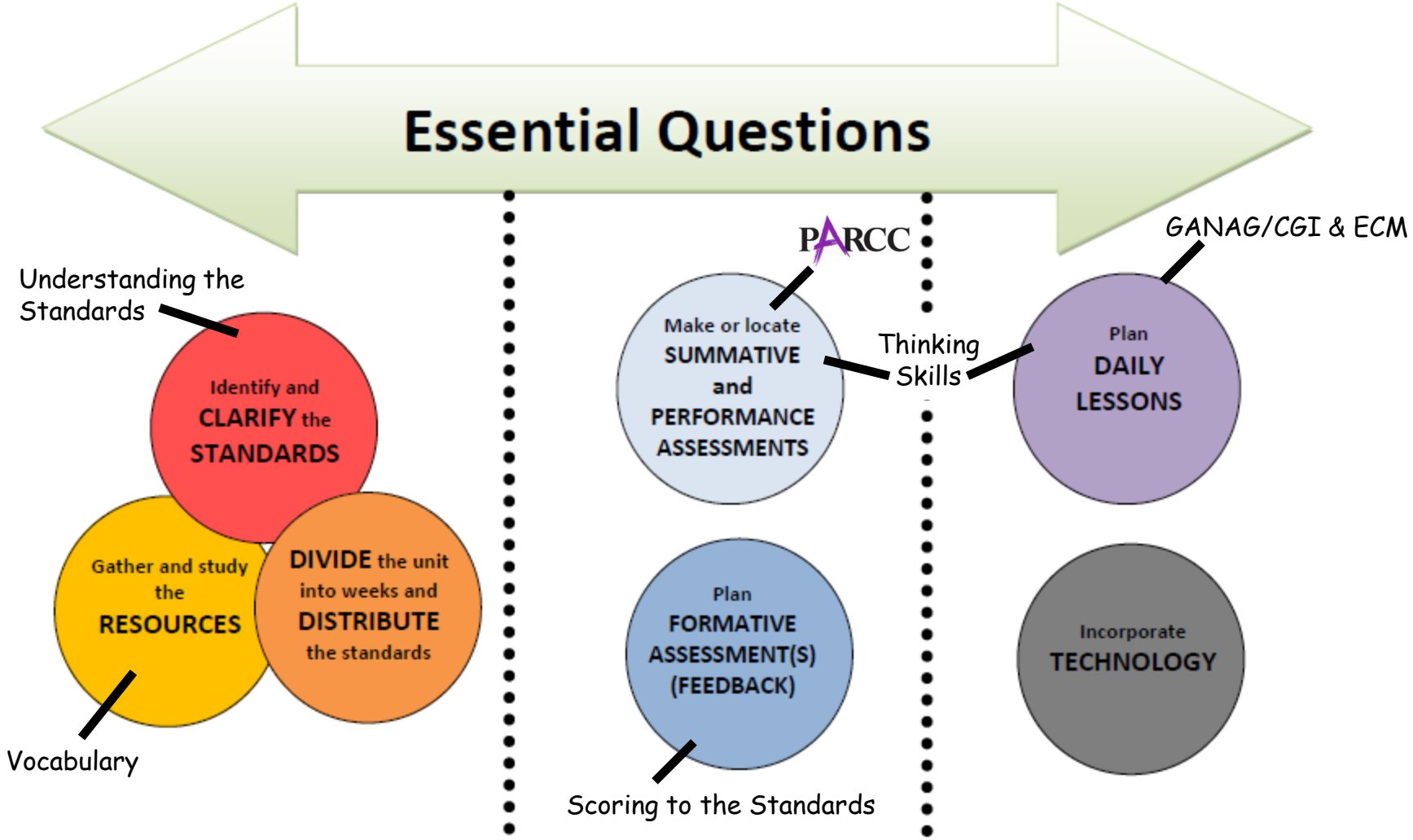
Thinking Skills

PARCC

Backward Unit Planning 1.0



Backward Unit Planning 1.0



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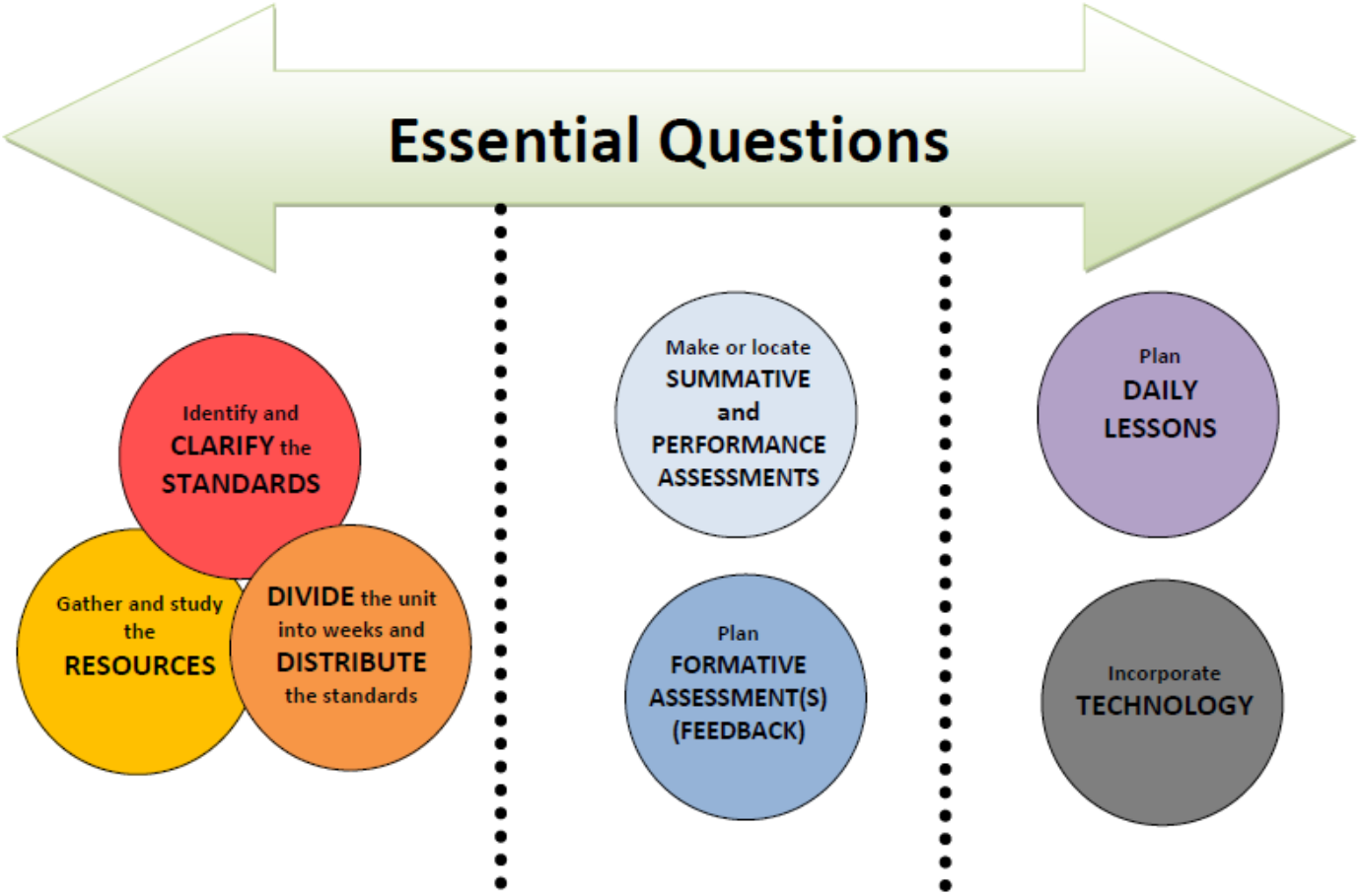


BIG 4

- Well Articulated Curriculum
- Plan for Instruction
- Varied Assessment
- Standards-based Feedback

Teaching Closet

The Big Four

- Well Articulated Curriculum
- Plan for Instruction
- Varied Assessment
- Standards-based Feedback

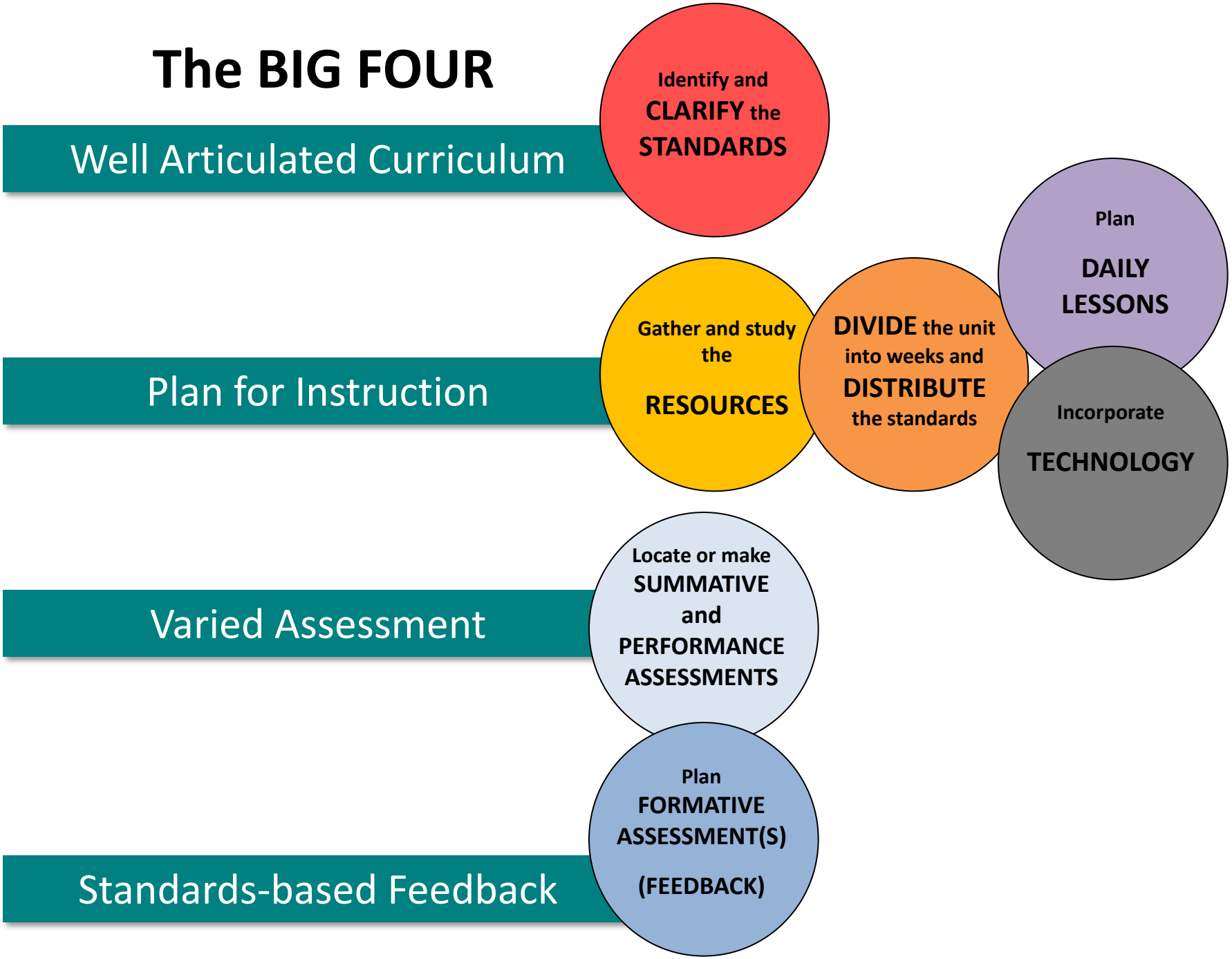
Common Core Standards
ELD Standards
Arkansas Curriculum Frameworks
Curriculum Documents

GANAG
Lesson Plan Book
SIOP
C.G.I./ECM
Smartboard
Co-teaching
Kagan Cooperative Learning

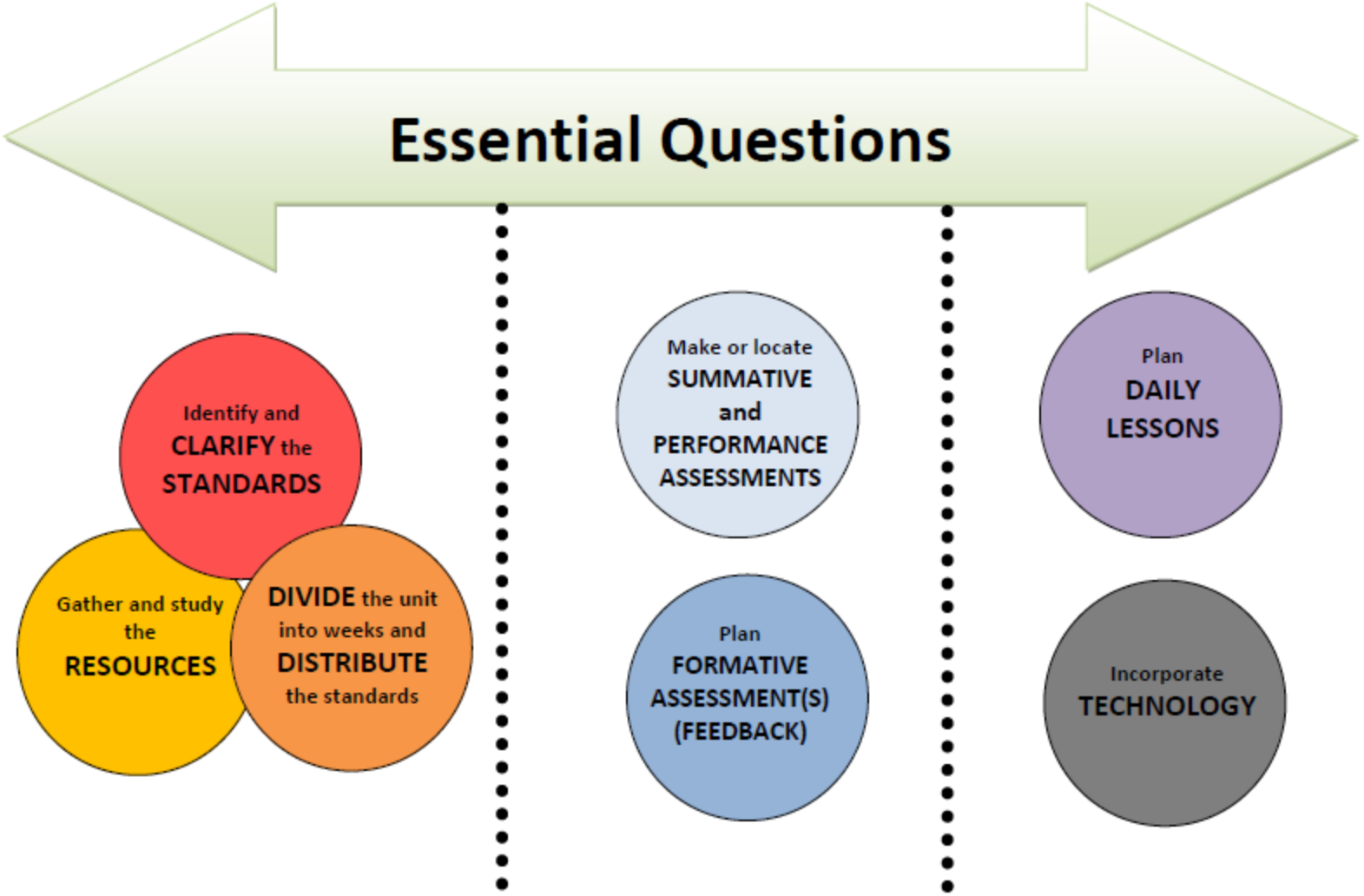
MAP
DIBELS
DRA
CRT/NRT Tests
Formative/Summative Assessment
Scoring Guides
Performance Assessments

Progress Report
Daily scores & grade book
Student Conferences
Report Card
Parent/Teacher Conferences

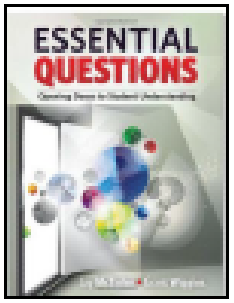
The BIG FOUR


Well Articulated Curriculum
Identify and CLARIFY the STANDARDS
Plan for Instruction
Gather and study the RESOURCES
DIVIDE the unit into weeks and DISTRIBUTE the standards
Plan DAILY LESSONS
Incorporate TECHNOLOGY
Varied Assessment
Locate or make SUMMATIVE and PERFORMANCE ASSESSMENTS
Standards-based Feedback
Plan FORMATIVE ASSESSMENT(S) (FEEDBACK)

Backward Unit Planning 1.0



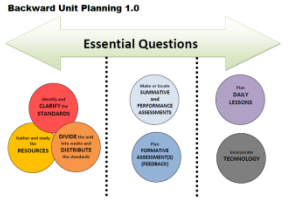
7 Defining Characteristics



A good essential question:

1. Is *open-ended*; that is, it typically will not have a single, final, and correct answer.
2. Is *thought-provoking* and *intellectually engaging,* often sparking discussion and debate.
3. Calls for *higher-order thinking* such as analysis, inference, evaluation, prediction. It cannot be effectively answered by recall alone.
4. Points toward *important, transferable ideas* within (and sometimes across) disciplines.
5. Raises *additional questions* and sparks further inquiry.
6. Requires *support* and *justification*, not just an answer.
7. *Recurs* over time; that is, the questions can and should be revisited again and again.

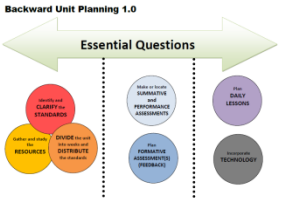
Mathematical Practices



1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Turn and TALK

Essential Questions



R.P.S. Common Core Math Curriculum — Kindergarten

1st Quarter (p. 1 of 2)

Using Numbers to Represent Quantities; Identifying and Describing Shapes

Students begin to use numbers (including written numerals) to represent quantities. They begin to count objects in a set and pair each object with one number name. They begin to explore the concept that the number of objects is the same regardless of their arrangement or the order in which they are counted. They also begin to model simple joining and separating situations using objects, fingers, mental images, drawings, sounds, acting out situations and verbal explanations. Students also learn to identify and describe 2-dimensional and 3-dimensional shapes.

Essential Questions:

How does counting help me solve problems?

How can I model simple joining and separating situations with sets of objects?

What shapes do we see in the world around us?

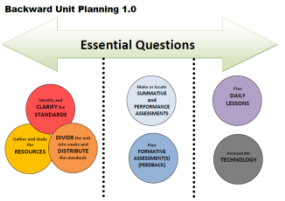
Counting and Cardinality	
Know number names and the count sequence.	
K.CC.1	Count to 100 by ones and by tens.
	Minimum Quarterly Expectations: Rote count by 1's to 20
K.CC.2	Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
K.CC.3	Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).
	Minimum Quarterly Expectations: Write numbers 0-5
Count to tell the number of objects	
K.CC.4	Understand the relationship between numbers and quantities; connect counting to cardinality.
	a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
	b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
	c. Understand that each successive number name refers to a quantity that is one larger.
K.CC.5	Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.
	Minimum Quarterly Expectations: Count to answer "how many" questions about as many as 5 objects...

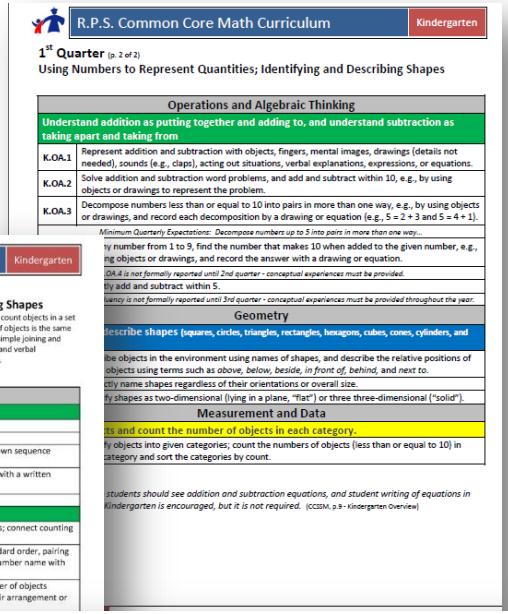
Continued on next page...

1. ***How does counting help me solve problems?***
2. ***How can I show my thinking when solving story problems?***
3. ***What shapes do I see in the world around me?***
4. ***How can I sort these objects?***

Clarifying Documents

Identify and CLARIFY the STANDARDS




R.P.S. Common Core Math Curriculum — Kindergarten

1st Quarter (p. 2 of 2)

Using Numbers to Represent Quantities; Identifying and Describing Shapes

Operations and Algebraic Thinking	
Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from	
K.OA.1	Represent addition and subtraction with objects, fingers, mental images, drawings (details not needed), sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
K.OA.2	Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
K.OA.3	Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).

Minimum Quarterly Expectations: Decompose numbers up to 5 into pairs in more than one way...

...y number from 1 to 9, find the number that makes 10 when added to the given number, e.g., ...ng objects or drawings, and record the answer with a drawing or equation.

...OA.4 is not formally reported until 2nd quarter - conceptual experiences must be provided.

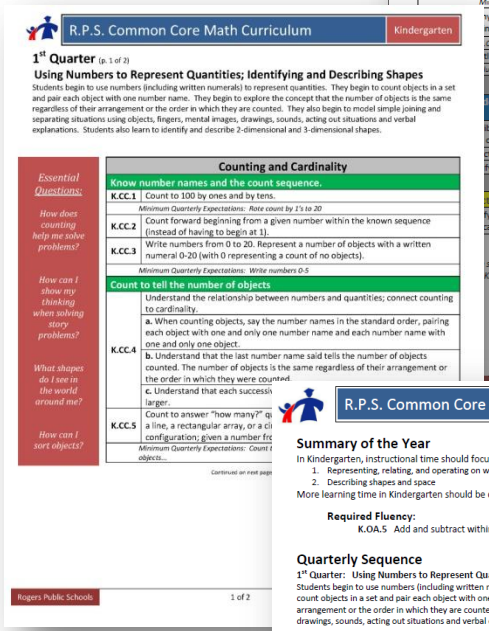
...ly add and subtract within 5.

...uency is not formally reported until 3rd quarter - conceptual experiences must be provided throughout the year.

Geometry	
...escribe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and	
...be objects in the environment using names of shapes, and describe the relative positions of ...objects using terms such as *above, below, beside, in front of, behind,* and *next to.*	
...ctly name shapes regardless of their orientations or overall size.	
...fy shapes as two-dimensional (lying in a plane, "flat") or three three-dimensional ("solid").	

Measurement and Data	
...ts and count the number of objects in each category.	
...fy objects into given categories; count the numbers of objects (less than or equal to 10) in ...tegory and sort the categories by count.	

...students should see addition and subtraction equations, and student writing of equations in ...Kindergarten is encouraged, but it is not required. (CCSSM, p.9 - Kindergarten Overview)


R.P.S. Common Core Math Curriculum — Kindergarten

1st Quarter (p. 1 of 2)

Using Numbers to Represent Quantities; Identifying and Describing Shapes

Students begin to use numbers (including written numerals) to represent quantities. They begin to count objects in a set and pair each object with one number name. They begin to explore the concept that the number of objects is the same regardless of their arrangement or the order in which they are counted. They also begin to model simple joining and separating situations using objects, fingers, mental images, drawings, sounds, acting out situations and verbal explanations. Students also learn to identify and describe 2-dimensional and 3-dimensional shapes.

Essential Questions:

How does counting help me solve problems?

How can I show my thinking when solving story problems?

What shapes do I see in the world around me?

How can I sort objects?

Counting and Cardinality	
Know number names and the count sequence.	
K.CC.1	Count to 100 by ones and by tens.
	Minimum Quarterly Expectations: Rote count by 1's to 20
K.CC.2	Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
K.CC.3	Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).
	Minimum Quarterly Expectations: Write numbers 0-5
Count to tell the number of objects	
K.CC.4	Understand the relationship between numbers and quantities; connect counting to cardinality. **a.** When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object. **b.** Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. **c.** Understand that each successiv... larger.
K.CC.5	Count to answer "how many?" q... a line, a rectangular array, or a cl... configuration; given a number fr...
	Minimum Quarterly Expectations: Count t... objects...

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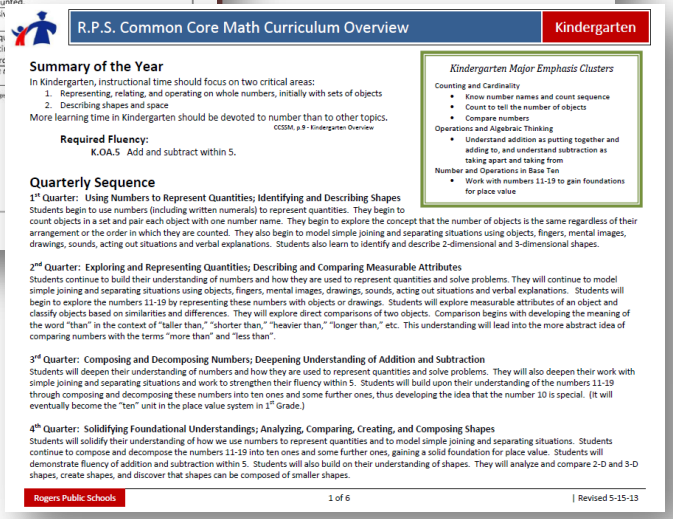
Rogers Public Schools 1 of 2


R.P.S. Common Core Math Curriculum Overview — Kindergarten

Summary of the Year

In Kindergarten, instructional time should focus on two critical areas:

1. Representing, relating, and operating on whole numbers, initially with sets of objects
2. Describing shapes and space

More learning time in Kindergarten should be devoted to number than to other topics. CCSSM, p.9 - Kindergarten Overview

Required Fluency:

K.OA.5 Add and subtract within 5.

Kindergarten Major Emphasis Clusters

Counting and Cardinality
- Know number names and count sequence
- Count to tell the number of objects
- Compare numbers

Operations and Algebraic Thinking
- Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from

Number and Operations in Base Ten
- Work with numbers 11-19 to gain foundations for place value

Quarterly Sequence

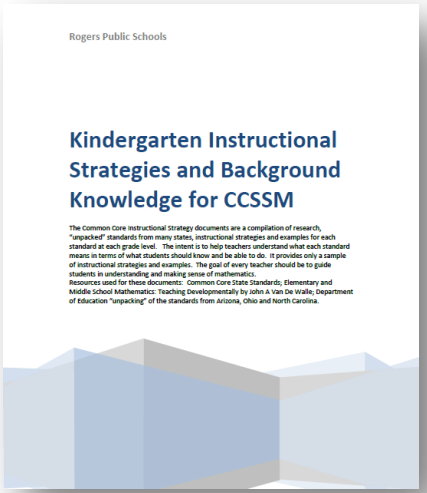
1st Quarter: Using Numbers to Represent Quantities; Identifying and Describing Shapes
Students begin to use numbers (including written numerals) to represent quantities. They begin to count objects in a set and pair each object with one number name. They begin to explore the concept that the number of objects is the same regardless of their arrangement or the order in which they are counted. They also begin to model simple joining and separating situations using objects, fingers, mental images, drawings, sounds, acting out situations and verbal explanations. Students also learn to identify and describe 2-dimensional and 3-dimensional shapes.

2nd Quarter: Exploring and Representing Quantities; Describing and Comparing Measurable Attributes
Students continue to build their understanding of numbers and how they are used to represent quantities and solve problems. They will continue to model simple joining and separating situations using objects, fingers, mental images, drawings, sounds, acting out situations and verbal explanations. Students will begin to explore the numbers 11-19 by representing these numbers with objects or drawings. Students will explore measurable attributes of an object and classify objects based on similarities and differences. They will explore direct comparisons of two objects. Comparison begins with developing the meaning of the word "than" in the context of "taller than," "shorter than," "heavier than," "longer than," etc. This understanding will lead into the more abstract idea of comparing numbers with the terms "more than" and "less than".

3rd Quarter: Composing and Decomposing Numbers; Deepening Understanding of Addition and Subtraction
Students will deepen their understanding of numbers and how they are used to represent quantities and solve problems. They will also deepen their work with simple joining and separating situations and work to strengthen their fluency within 5. Students will build upon their understanding of the numbers 11-19 through composing and decomposing these numbers into ten ones and some further ones, thus developing the idea that the number 10 is special. (It will eventually become the "ten" unit in the place value system in 1st Grade.)

4th Quarter: Solidifying Foundational Understandings; Analyzing, Comparing, Creating, and Composing Shapes
Students will solidify their understanding of how we use numbers to represent quantities and to model simple joining and separating situations. Students continue to compose and decompose the numbers 11-19 into ten ones and some further ones, gaining a solid foundation for place value. Students will demonstrate fluency of addition and subtraction within 5. Students will also build on their understanding of shapes. They will analyze and compare 2-D and 3-D shapes, create shapes, and discover that shapes can be composed of smaller shapes.

Rogers Public Schools 1 of 6 | Revised 5-15-13


Rogers Public Schools

Kindergarten Instructional Strategies and Background Knowledge for CCSSM

The Common Core Instructional Strategy documents are a compilation of research, "unpacked" standards from many states, instructional strategies and examples for each standard at each grade level. The intent is to help teachers understand what each standard means in terms of what students should know and be able to do. It provides only a sample of instructional strategies and examples. The goal of every teacher should be to guide students in understanding and making sense of mathematics.
Resources used for these documents: Common Core State Standards; Elementary and Middle School Mathematics: Teaching Developmentally by John A Van De Walle; Department of Education "unpacking" of the standards from Arizona, Ohio and North Carolina.

K, Counting and Cardinality; K–5, Operations and Algebraic Thinking

K–6, Geometry

K–5, Number and Operations in Base Ten

K–3, Categorical Data; Grades 2–5, Measurement Data*

Progression Documents

Counting and Cardinality	
Know number names and the count sequence.	
K.CC.1	Count to 100 by ones and by tens.
	Minimum Quarterly Expectations: Rote count by 1's to 20
K.CC.2	Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
K.CC.3	Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).
	Minimum Quarterly Expectations: Write numbers 0-5
Count to tell the number of objects	
K.CC.4	Understand the relationship between numbers and quantities; connect counting to cardinality.
	a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
	b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
	c. Understand that each successive number name refers to a quantity that is one larger.
K.CC.5	Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.
	Minimum Quarterly Expectations: Count to answer "how many" questions about as many as 5 objects...

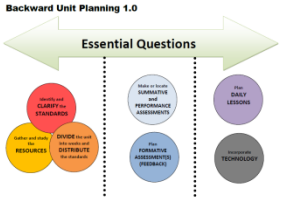
Pre-K comes in working with numbers to 10. Even though we have **minimum** quarterly expectations, we ***don't*** have to stay there.

Identify and **CLARIFY** the **STANDARDS**

Cardinality means one-to-one correspondence. All of these standards have an idea of all their own.

Subitizing is the ability to recognize a quantity without counting.

K.CC.4 is when ***you give them objects*** and they count.
K.CC.5 is when ***you give the students a number*** and then they count out those objects.



Operations and Algebraic Thinking	
Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from	
K.OA.1	Represent addition and subtraction with objects, fingers, mental images, drawings (details not needed), sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
K.OA.2	Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
K.OA.3	Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).
Minimum Quarterly Expectations: Decompose numbers up to 5 into pairs in more than one way…	
K.OA.4	For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.
K.OA.4 is not formally reported until 2nd quarter - conceptual experiences must be provided.	
K.OA.5	Fluently add and subtract within 5.
Fluency is not formally reported until 3rd quarter - conceptual experiences must be provided throughout the year.	

K.OA.1 is understanding the concept behind addition and subtraction. When you add it gets bigger, when you subtract it gets smaller**.**

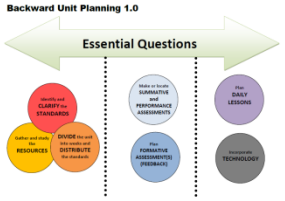
K.OA.2 is the application of K.OA.1 combined with K.CC standards.

K.OA.3 means decomposing numbers **UP** to 10, **NOT JUST 10** (aka combinations).
K.OA.4 is the inverse of K.OA.3, now students will find the missing addend (aka separations).
Just like K.OA.3, you don't have to start with 10. Whatever number you are working with for K.OA.3, you can do with K.OA.4. You can do these simultaneously.

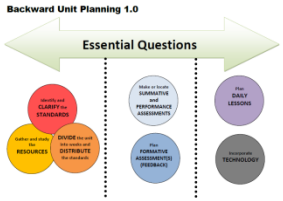
Identify and CLARIFY the STANDARDS

K.OA.3 and **K.OA.4** should work through a progression (like a ramp). Work with smaller numbers and build up to 5. (For example: Start with 3). Use of concrete objects might easier then beginning with double-sided counters.

K.OA.5 fluency will happen when students have ***multiple experiences*** with K.OA.3 and K.OA.4.



Identify and **CLARIFY** the **STANDARDS**



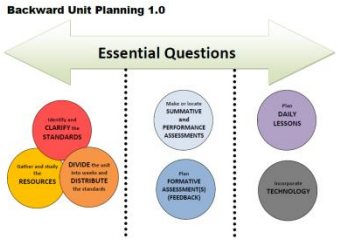
K.G.1 can be embedded throughout the day. We will purposefully use the terms when we talk with students. (Note: The words above and beside do not translate in Spanish).

Geometry	
Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).	
K.G.1	Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above, below, beside, in front of, behind,* and *next to.*
K.G.2	Correctly name shapes regardless of their orientations or overall size.
K.G.3	Identify shapes as two-dimensional (lying in a plane, "flat") or three three-dimensional ("solid").
Measurement and Data	
Classify objects and count the number of objects in each category.	
K.MD.3	Classify objects into given categories; count the numbers of objects (less than or equal to 10) in each category and sort the categories by count.

K.G.2 and **K.G.3** are foundational to later geometry standards in 4th quarter. However, these two particular standards will **not** appear again.
We suggest teaching these standards early in the quarter and assess mid-quarter to determine if re-teaching is necessary.

K.MD.3 is foundational to categorical data in future grades. Students also had experiences with sorting in Pre-K. ***This is a nice standard to combine with the geometry standards.***

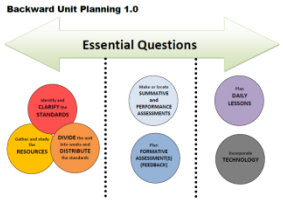
Week	Standards	Structure/Resources	Counting Collections
1	K.CC.1 K.CC.4 K.CC.5 K.OA.1	Have kids report or count how many things at home Oral story problems (turn to partner: count eyes, noses, fingers, ears, etc.)	X
2	K.MD.3 K.MD.3/K.G.2 K.OA.2/K.OA.1 K.CC.5	Go home graph Sort shapes Oral story problems (no paper, manipulatives and white board available) Dot images/ten frames	K.CC.1 K.CC.4
3	K.MD.3/K.G.2 K.OA.2/K.OA.1 K.CC.5 K.OA.3/K.OA.4 (K.OA.5)	Sort shapes Oral story problems (no paper, manipulatives and white boards available) Dot images/ten frames Combinations/separations* (using concrete objects)	K.CC.1 K.CC.3 (Writing numbers on post-it notes) K.CC.4



DIVIDE the unit into weeks and **DISTRIBUTE** the standards

During 1st Quarter we are going to pose JRU, SRU, and PPW-WU.

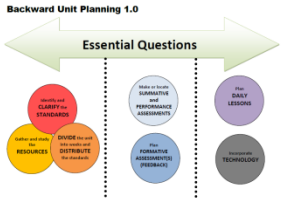
Week	Standards	Structure/Resources	Counting Collections
4	K.MD.3/K.G.3 K.OA.2/K.OA.1 K.OA.3/K.OA.4 (K.OA.5) K.CC.5	Sort shapes-emphasis on flat vs. non flat CGI problem types Combinations/separations* Dot images/ten frames	K.CC.1 K.CC.3 (Writing numbers on post-it notes) K.CC.4
5	K.CC.2 K.OA.2/K.OA.1 K.OA.3/K.OA.4 (K.OA.5) K.CC.5	Counting on from a number using a number line CGI problem types Combinations/separations* Dot images/ten frames	K.CC.1 K.CC.3 (Writing numbers on post-it notes) K.CC.4
6	K.CC.2 K.OA.2/K.OA.1 K.OA.3/K.OA.4 (K.OA.5) K.CC.5	Counting on from a number using a number line CGI problem types Combinations/separations* Dot images/ten frames	K.CC.1 K.CC.3 (Writing numbers on post-it notes) K.CC.4



DIVIDE the unit into weeks and **DISTRIBUTE** the standards

During 1st Quarter we are going to pose JRU, SRU, and PPW-WU.

Week	Standards	Structure/Resources	Counting Collections
7	K.CC.2 K.OA.2/K.OA.1 K.OA.3/K.OA.4 (K.OA.5) K.CC.5	Counting on from a number using a number line CGI problem types Combinations/separations* Dot images/ten frames	K.CC.1 K.CC.3 (Writing numbers on post-it notes) K.CC.4
8	K.CC.2 K.OA.2/K.OA.1 K.OA.3/K.OA.4 (K.OA.5) K.CC.5	Counting on from a number using a number line CGI problem types Combinations/separations* Dot images/ten frames	K.CC.1 K.CC.3 (Writing numbers on post-it notes) K.CC.4
9	K.CC.2 K.OA.2/K.OA.1 K.OA.3/K.OA.4 (K.OA.5) K.CC.5	Counting on from a number using a number line CGI problem types Combinations/separations* Dot images/ten frames	K.CC.1 K.CC.3 (Writing numbers on post-it notes) K.CC.4



DIVIDE the unit into weeks and **DISTRIBUTE** the standards

During 1st Quarter we are going to pose JRU, SRU, and PPW-WU.

Kindergarten 9 Weeks

Using Numbers to Represent Quantities; Identifying and Describing Shapes

Students begin to use numbers (including written numerals) to represent quantities. They begin to count objects in a set and pair each object with one number name. They begin to explore the concept that the number of objects is the same regardless of their arrangement or the order in which they are counted. They also begin to model simple joining and separating situations using objects, fingers, mental images, drawings, sounds, acting out situations and verbal explanations. Students also learn to identify and describe 2-dimensional and 3-dimensional shapes.

1st Quarter Pacing Guide

Lessons addressing the Unit Standards

Lessons listed below are in no particular order or instructional sequence...the needs of your students will determine your instructional path through this unit.

Multi-Day Lessons:

Let's Count to 5: In this series of 6 lessons, students make groups of zero through five objects and connect number words to the groups. They use numerals to record the size of a group. Familiar nursery rhymes and songs and visual, auditory, and kinesthetic activities are included in each lesson. (standards addressed: K.CC.4, K.CC.5, K.CC.1, K.CC.2, K.CC.3)

Learning Patterns: Provide each student with five counters and a piece of construction paper as a mat. Hold up a dot plate for about 3 seconds. "Make the pattern you saw using the counters on the mat. How many dots did you see? How did you see them?" Spend some time discussing the configuration of the pattern and how many dots. Do this with a few new patterns each day.

1st Quarter

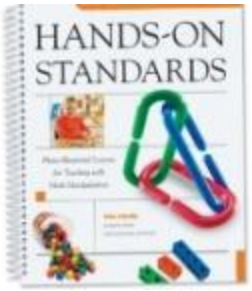
Essential Questions

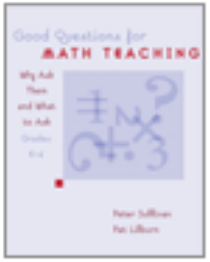
How does counting help me solve problems?

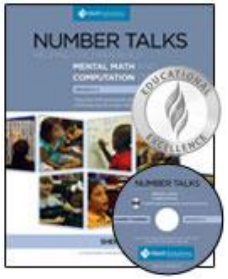
How can I model simple joining and separating situation with sets of objects?

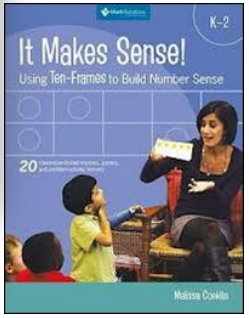
What shapes do we see in the world around us?

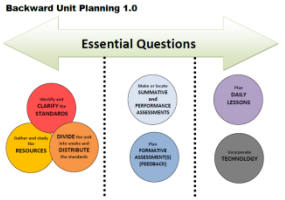
Mathematical Practices











Gather and study the

RESOURCES

CGI Addition & Subtraction Problem Types

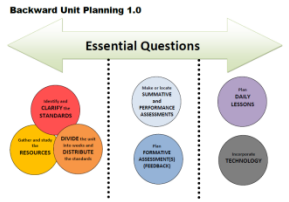
*adapted from *Children's Mathematics Cognitively Guided Instruction* by Carpenter, Fennema, Franke, Levi, Empson

	Result Unknown	Change Unknown	Start Unknown
Join	Sarah had 6 crayons. Brad gave her 7 more crayons. How many crayons does Sarah have altogether?	Sarah has 6 crayons. How many more crayons does she need to have 13 altogether?	Sarah had some crayons. Brad gave her 7 more crayons. Now she has 13 crayons. How many crayons did Sarah have to start with?
Separate	Sarah had 13 crayons. She gave 6 to Brad. How many crayons does Sarah have left?	Sarah had 13 crayons. She gave some to Brad. Now she has 7 marbles left. How many marbles did she give to Brad?	Sarah had some crayons. She gave 6 to Brad. Now she has 7 crayons left. How many crayons did Sarah have to start with?

	Whole Unknown		Part Unknown
Part-Part-Whole	Sarah has 6 green crayons and 7 purple crayons. How many crayons does she have?		Sarah has 13 crayons. 6 are green and the rest are purple. How many purple crayons does Sarah have?

	Difference Unknown	Compare Quantity Unknown	Referent Unknown
Compare	Sarah has 13 crayons. Brad has 7 crayons. How many more crayons does Sarah have than Brad?	Brad has 7 crayons. Sarah has 6 more than Brad. How many crayons does Sarah have?	Sarah has 13 crayons. She has 6 more crayons than Brad. How many crayons does Brad have?

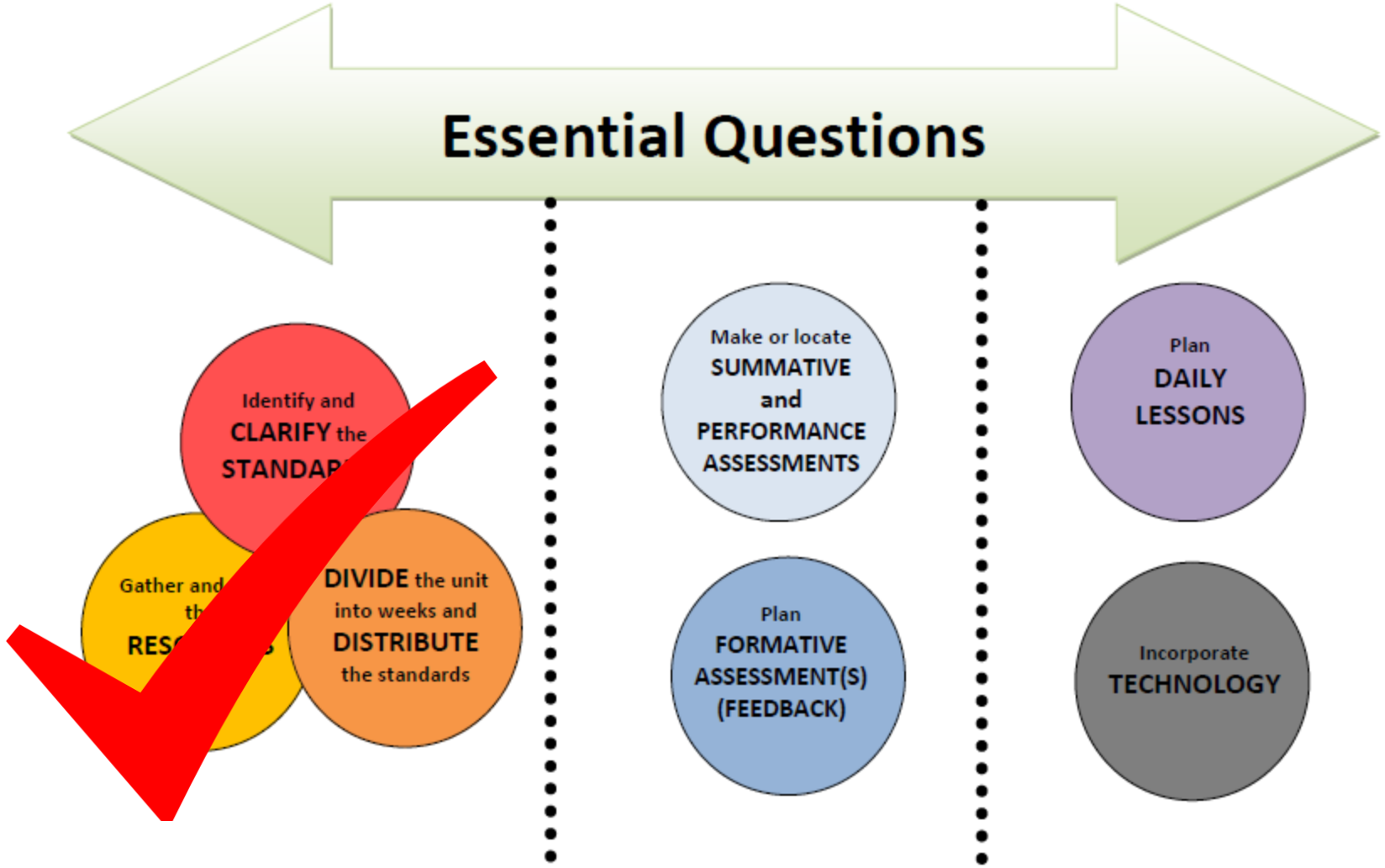
Rogers Public Schools



Answer Essential Questions

1. ***How does counting help me solve problems?***
2. ***How can I show my thinking when solving story problems?***
3. ***What shapes do I see in the world around me?***
4. ***How can I sort these objects?***

Backward Unit Planning 1.0



Assessment Tasks

Turn and TALK

External Measures

State Tests

District Tests

Classroom
Assessment Tasks

FORMATIVE
Provides instructive feedback about progress intended for improvement

- **observation**
- **assignments & quizzes**
- **student self- assessment**

SUMMATIVE
Provides summary of achievement at a point in time

- **performance tasks**
- **tests for comprehension and thinking**
- **end of unit tests**

Evaluating Student Performance

Grading & Record Keeping
for Improvement

Grade Books

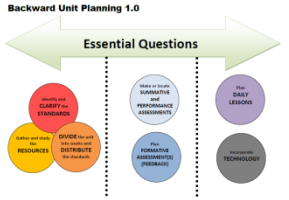
Reporting

Report Cards
Progress Reports

One Teacher at a Time (Pollock, 2007)

Summative Assessment *is designed and administered to "sum up" learning that has taken place during a lesson, a unit, or a course.*

- Anne R. Reeves



Considerations:

Make and locate SUMMATIVE And PERFORMANCE ASSESSMENTS

1. ***Assess*** **CCSS**
2. ***Address*** **Essential Questions**
3. **Incorporate *Mathematical Practices***
4. PARCC & THE IOWA TESTS® Measurement You Can Trust℠ Innovation You Can Use

E.Q. - How does counting help me solve problems?

We decided we would conference with students during counting collections in order to assess our K.CC standards.

Counting Collections

Name: _____

Collection# 1 2 3 4 5 6 7 8 9 10

Total:

My collection looks like this:

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

Counting Collections

Name: _____

Collection# 1 2 3 4 5 6 7 8 9 10

Total:

My collection looks like this:

1	2	3	
11	12	13	
21	22	23	
31	32	33	
41	42	43	
51	52	53	
61	62	63	
71	72	73	
81	82	83	
91	92	93	

Name _____

Counting Collections

Bag

Draw your collection

Total in bag

Name _____

llections

llection

Total in bag

Counting Collections

My name: _____

Collection Number: 1 2 3 4 5 6 7 8 9 10

Total: _____

My collection looks like this:

How can I show my thinking when solving story problems?

CGI Student Strategy Recording Form

Single Digit Addition & Subtraction

Problem Type:_____
CGI Story:

Number Sets:

Non-Valid	Direct Modeling	Counting	Derived Facts and/or Recalled Facts	Flexible Strategies (can be evident in any of the previous three stages)
	-Represents all quantities -Follows action or situation of story	-Conserves one number is his/her head -Counts on or back by ONES	-Uses an addition/subtraction fact they know to solve one they don't know (derived fact) -Knows an addition/subtraction fact from memory (recalled fact)	-Strategy does not match the action or situation of the problem

Kindergarten – 1st Quarter Using Numbers to Represent Quantities; Identifying and Describing Shapes

For this assessment, numbers were chosen within 10 to score to the standard. During this first quarter please feel free to use numbers higher than 10 based on your formative assessment data.

"This standard states "addition and subtraction word problems" and in the appendix it is hoped that Kindergarteners would be able to solve a variety of addition/subtraction problem types with the unknown in **all positions**. However, for the beginning of the year, we realize you may begin with only these three problem types. Please feel free to include other problem types based on the needs of your students.

JRU (Join Result Unknown) CCSS – Add to Result Unknown

_____ has ____ cookies. ____ gives her ____ more cookies. How many cookies does _____ have now?

(2, 2) (2, 3) (3, 3)

SRU (Separate Result Unknown) CCSS - Take From Result Unknown

____ has _____ crackers. She eats _____ crackers. How many crackers does ____ have left?

(3, 1) (5, 2) (6, 3)

(Pre-assessment for 2nd quarter)

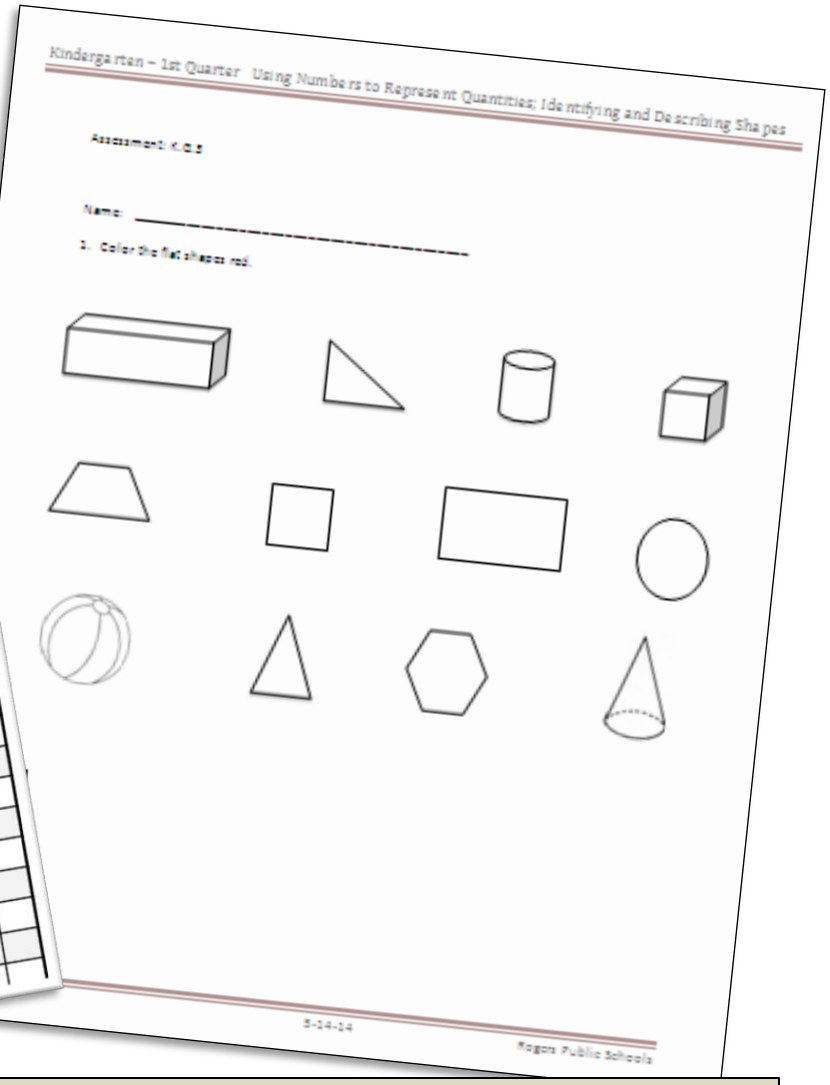
PPW-WU (Part Part Whole – Whole Unknown) CCSS – Put together Total Unknown

There are 4 boys and 6 girls playing on the playground. How many kids are playing in all?

For formative assessment purposes we would use our strategy sheets, and for a summative assessment we would use the assessment provided.

What shapes do I see in the world around me?

Report Card Descriptor	Identifies and describes shapes
Standard to Be Measured	K.G.1. Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to. K.G.2. Correctly name shapes regardless of their orientations or overall size. K.G.3. Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").
Quarter	1st Quarter
Student	



We felt that K.G.1 and K.G.2 could be assessed through the use of the scoring guide. An assessment has been provided for K.G.3.

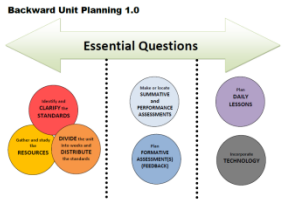
How can I sort these objects?

Report Card Descriptor	Sorts objects into categories & counts the number in each category															
Standard to Be Measured	**K.MD.3.** Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. [Limit category counts to be less than or equal to 10.]															
Quarter	1st Quarter								2nd Quarter							
Student																

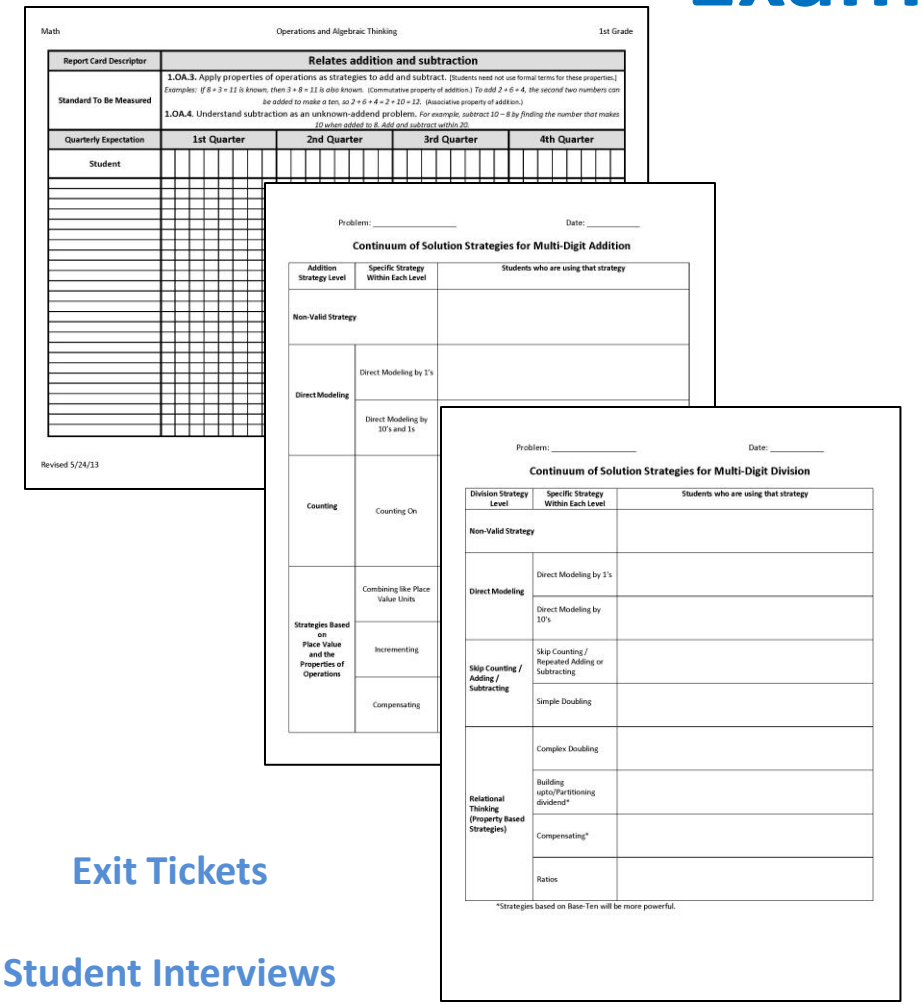
We felt that we would use our scoring guide for K.MD.3.

Formative Assessment *is used during the learning process. It's purpose is to inform the teacher and the students how well the learning is going.*

- Anne R. Reeves



Examples:



Math — Operations and Algebraic Thinking — 1st Grade

Report Card Descriptor	Relates addition and subtraction			
Standard To Be Measured	**1.OA.3.** Apply properties of operations as strategies to add and subtract. (Students need not use formal terms for these properties.) *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)* **1.OA.4.** Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8. Add and subtract within 20.*			
Quarterly Expectation	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Student				

Revised 5/24/13

Problem: _____ Date: _____

Continuum of Solution Strategies for Multi-Digit Addition

Addition Strategy Level	Specific Strategy Within Each Level	Students who are using that strategy
Non-Valid Strategy		
Direct Modeling	Direct Modeling by 1's	
	Direct Modeling by 10's and 1s	
Counting	Counting On	
Strategies Based on Place Value and the Properties of Operations	Combining like Place Value Units	
	Incrementing	
	Compensating	

Problem: _____ Date: _____

Continuum of Solution Strategies for Multi-Digit Division

Division Strategy Level	Specific Strategy Within Each Level	Students who are using that strategy
Non-Valid Strategy		
Direct Modeling	Direct Modeling by 1's	
	Direct Modeling by 10's	
Skip Counting / Adding / Subtracting	Skip Counting / Repeated Adding or Subtracting	
	Simple Doubling	
Relational Thinking (Property Based Strategies)	Complex Doubling	
	Building upto/Partitioning dividend*	
	Compensating*	
	Ratios	

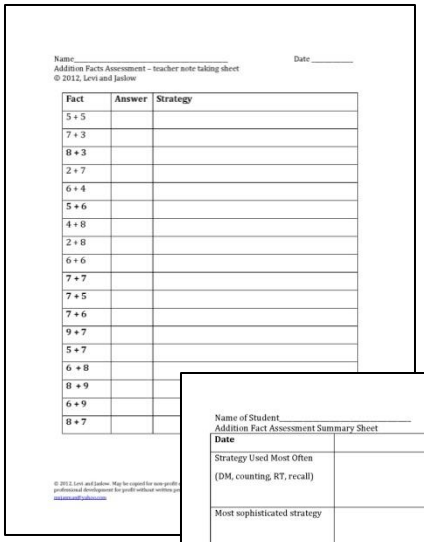
*Strategies based on Base-Ten will be more powerful.

Exit Tickets

Student Interviews

Open Ended Tasks

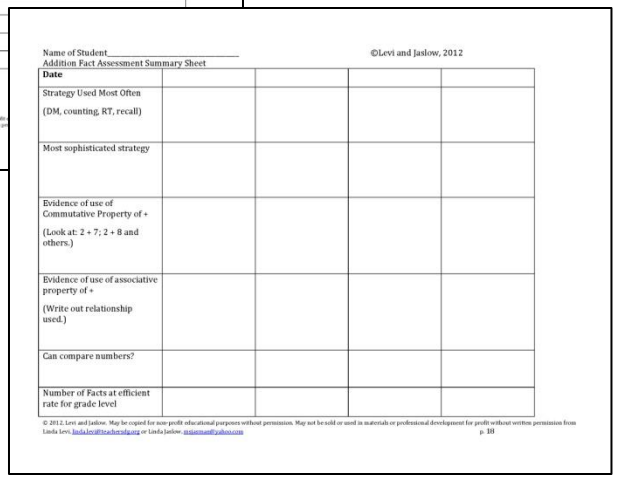
Fact Fluency Interviews/Assessment



Name_____ Date _____
Addition Facts Assessment – teacher note taking sheet
© 2012, Levi and Jaslow

Fact	Answer	Strategy
5 + 5		
7 + 3		
8 + 3		
2 + 7		
6 + 4		
5 + 6		
4 + 8		
2 + 8		
6 + 6		
7 + 7		
7 + 5		
7 + 6		
9 + 7		
5 + 7		
6 + 8		
8 + 9		
6 + 9		
8 + 7		

Plan FORMATIVE ASSESSMENT(S)



Name of Student_____ ©Levi and Jaslow, 2012
Addition Fact Assessment Summary Sheet

Date				
Strategy Used Most Often (DM, counting, RT, recall)				
Most sophisticated strategy				
Evidence of use of Commutative Property of + (Look at: 2 + 7; 2 + 8 and others.)				
Evidence of use of associative property of + (Write out relationship used.)				
Can compare numbers?				
Number of Facts at efficient rate for grade level				

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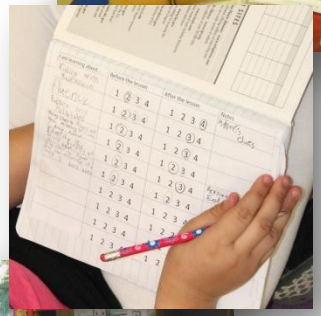
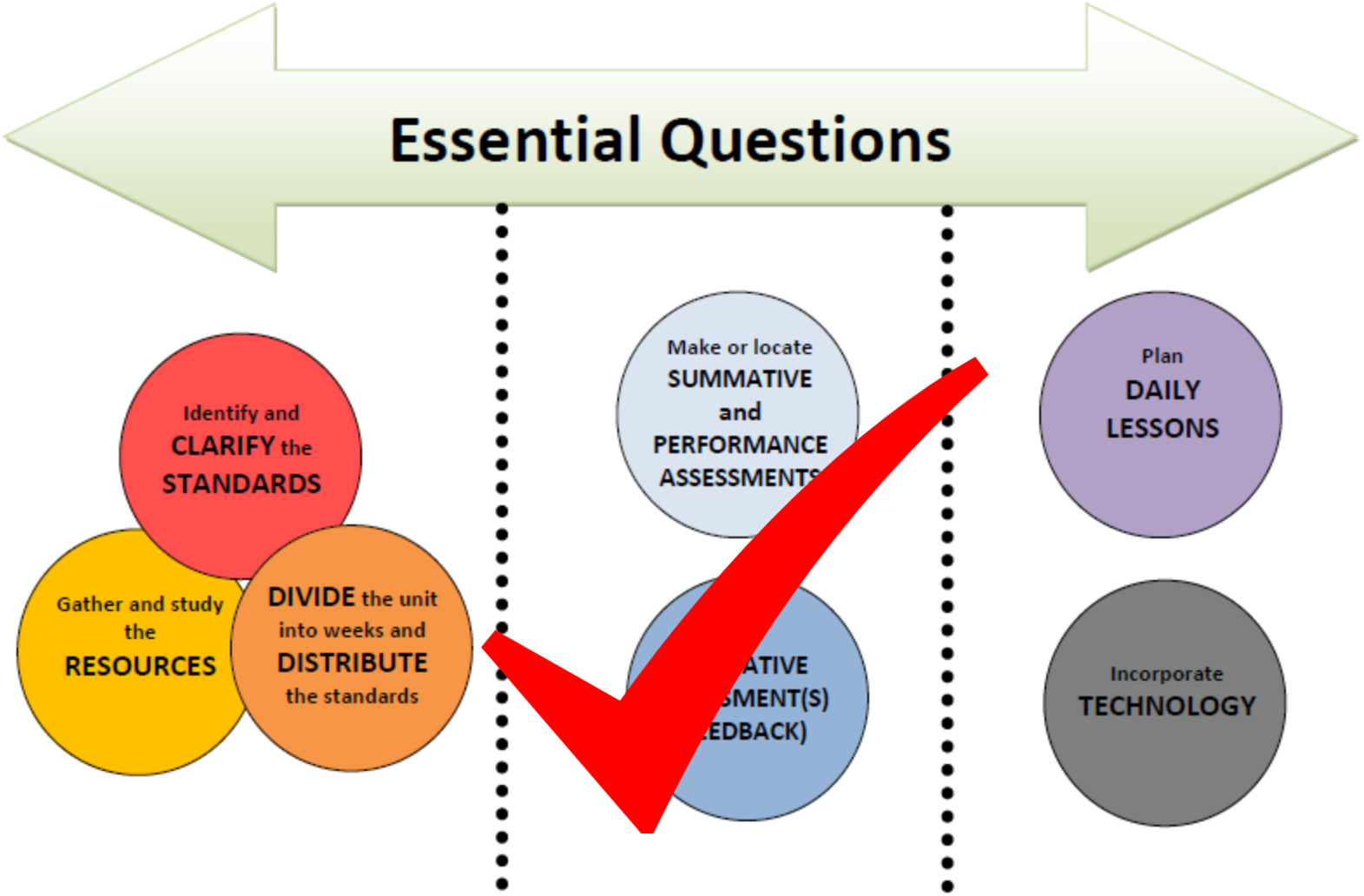
Types of Feedback

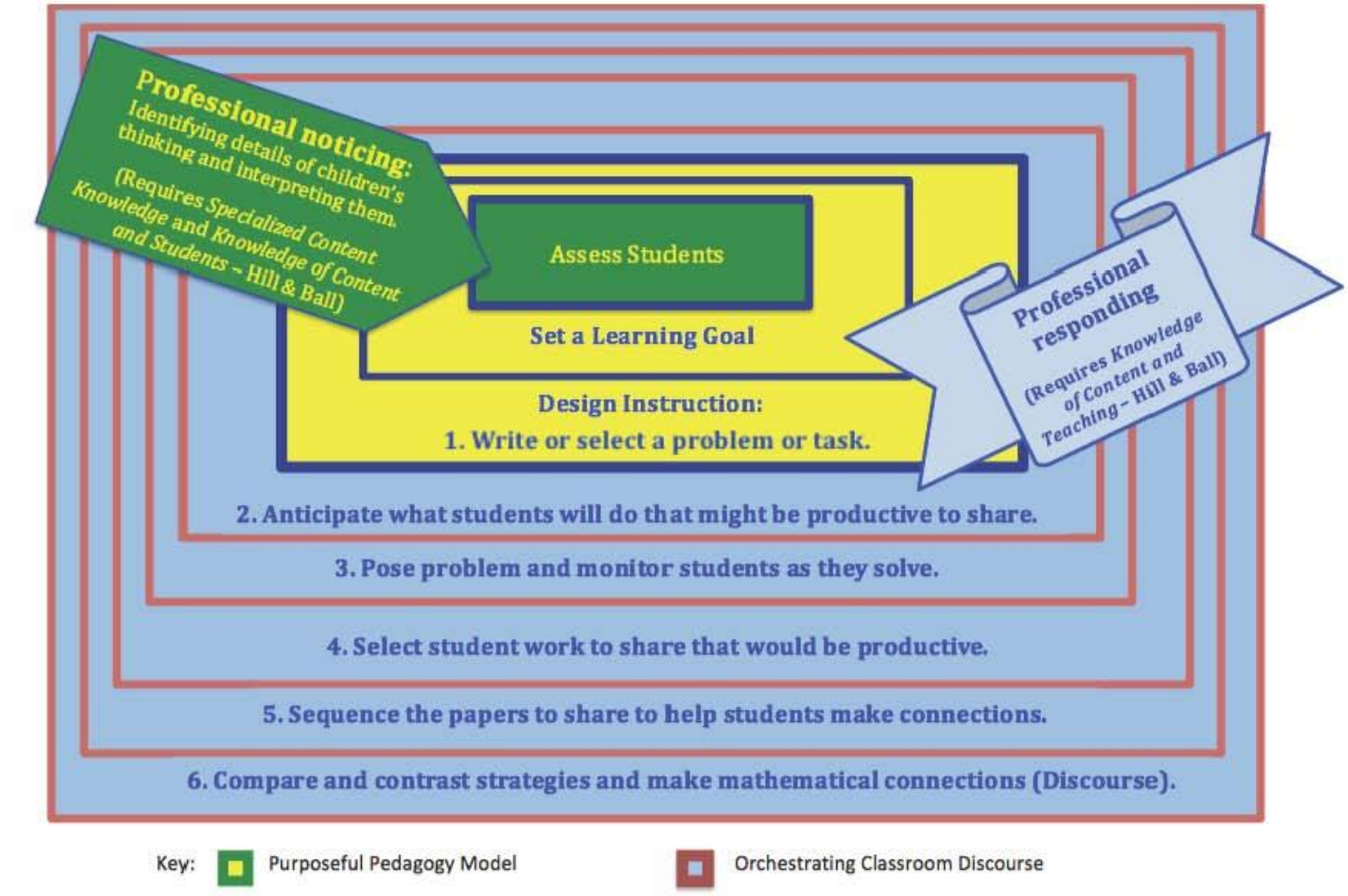


- **Expert** feedback
- Clarifying feedback from **peers**
- Reflective feedback from **self**
- **Listening in** feedback

Backward Unit Planning 1.0



Purposeful Pedagogy in Math



Written by Linda Jaslow in collaboration with Aimee L. Evans

CGI/ECM Structure:

Launch

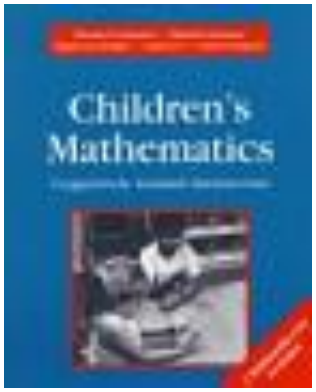
-Set the stage and pose the problem
-Time for students to think about their solution strategies/plan

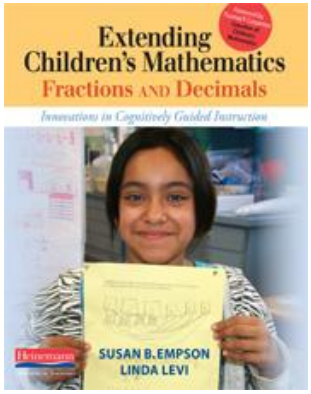
Students Independently Work

-Students work to solve the problem
-Teachers listen, notice and confer
-Teacher selects strategies to share

Discussion

-Compare and analyze strategies, mathematical understanding, notation, misconceptions, etc.





Purposeful Pedagogy and the High Yield Strategies in Math

Assessment is continuous throughout the lesson...

Lesson Component	Opportunities for Student Use of the High Yield Strategies
Launch - Set the stage (APK) and pose the problem to students - Provide time for students to mentally think about their solution strategies/plan or talk about how they plan to solve it	• Cues, Questions, and Advanced Organizers • Setting Objectives and Providing Feedback (if a goal was established before the lesson or students rated themselves before solving the problem) • Nonlinguistic Representations (if a picture was used as an APK or part of the problem launch) • Cooperative Learning (if students engaged in discussion or sharing about what they know/don't know about the problem)
Students Independently Work (Explore) - Students work to solve the problem – applying previous learning & understanding from past classroom discussions or working to gain new learning in their solution process - Teachers confer with students as they work – listen to and notice student strategies or their misconceptions while working (this will guide future instruction) - Teachers select strategies to share in the discussion that will lead to the content goal for the standard(s) selected	• Reinforcing Effort and Providing Recognition (thru teacher/student conferences) • Summarizing and Note Taking (students are recording their thinking) • Nonlinguistic Representations (students recording their thinking) • Homework and Practice (students are applying previously learned strategies, trying new strategies, etc.) • Generating and Testing Hypothesis (students generate a plan for solution, then work to solve the problem and test their plan) • Cooperative Learning (if students work together in partners or small groups to solve the problem or work on strategies to solve the problem) • Setting Objectives and Providing Feedback (thru teacher/student conferences) • Cues, Questions, and Advanced Organizers
Discussion (Summarize) - Teacher facilitates discussion of new learning by comparing strategies, looking at the mathematical understanding, notation, misconceptions, etc. - Students analyze other students' strategies, compare them to those selected for the discussion and to their strategy - Content goal/understanding is presented through the discussion - May end with a True/False Question or Open Number Sentence with a new set of numbers for student application of new learning	• Identifying Similarities and Differences (students are comparing and analyzing strategies) • Reinforcing Effort and Providing Recognition • Summarizing and Note Taking (students are summarizing what they "hear" their classmates sharing or doing mathematically) • Nonlinguistic Representations (students solutions posted during the discussion for comparison and analysis) • Cues, Questions, and Advanced Organizers • Cooperative Learning • Setting Objectives and Providing Feedback Content goal/understanding should develop thru the discussion (if a goal was established before the lesson or students rated themselves before solving the problem – generalization of that goal and their understanding would take place) • Homework and Practice (if a new set of numbers is used through a new problem, true/false question or open number sentence, students are applying previously learned strategies, trying new strategies, etc.) • Generating and Testing Hypothesis (generate hypothesis about strategies then test how or if they work in various situations)

Revised 10-4-13

Rogers Public Schools

GANAG is a daily lesson structure that allows teachers to plan for student use of research based instructional strategies.

G= goal

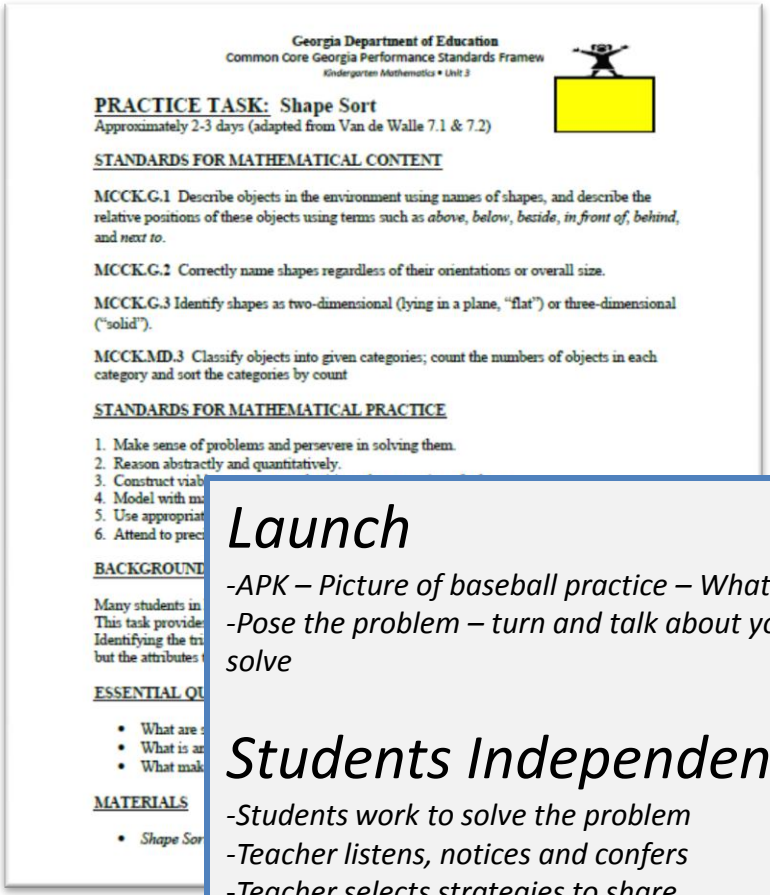
A= access prior knowledge

N= new information

A= application

G= generalize the goal

Daily Lesson Plans



Georgia Department of Education
Common Core Georgia Performance Standards Framew
Kindergarten Mathematics • Unit 3

PRACTICE TASK: Shape Sort
Approximately 2-3 days (adapted from Van de Walle 7.1 & 7.2)

STANDARDS FOR MATHEMATICAL CONTENT

MCCK.G.1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above, below, beside, in front of, behind,* and *next to*.

MCCK.G.2 Correctly name shapes regardless of their orientations or overall size.

MCCK.G.3 Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").

MCCK.MD.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viab
4. Model with m
5. Use appropriat
6. Attend to prec

BACKGROUND

Many students in
This task provide
Identifying the tri
but the attributes

ESSENTIAL QU

- What are
- What is a
- What mak

MATERIALS

- *Shape Sor*

Counting Collections

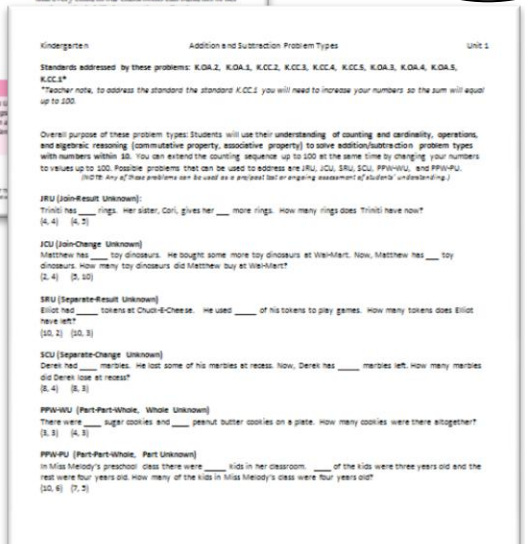
Lakeisha has lined up paintbrushes across a table and is rolling them one by one to the side. Tyler and Asveen are wrapping pencils into bundles. Maya is organizing toy kangaroos, and her partner, Max, is drawing a picture of how she is doing it. What is going on in this classroom?

Why Count Collections?

At the beginning of every school year, the five- to seven-year-olds at Corinne A. Seeds University Elementary School (UES) spend several weeks "counting collections." UES, the laboratory school of the Graduate School of Education and Information Studies at UCLA, serves a socioeconomically and ethnically diverse student population from urban and suburban Los Angeles. The classes are multiage, and the five- to seven-year-old classes include children who would be considered kindergarten and first-grade students.

Our work in counting collections was inspired by Megan Franke, a parent at our school and a researcher in mathematics education and children's thinking who has often worked in our classrooms. Megan encouraged us to try counting collections of objects with our young children, believing this would provide children with rich opportunities to practice oral counting, develop efficient counting strategies, group objects in strategic ways, record numbers, and represent their thinking. Research shows that although counting is one of the best ways we know to help children develop number sense and other important mathematical ideas, we do not do nearly enough of it in elementary schools. Children need lots of experience with counting to learn which number comes next, how this number sequence is related to the objects in front of them, and how to keep track of which ones have been counted and which still need to be counted (Fuson 1988). Experience with counting provides a solid foundation for future experience with addition, subtraction, multiplication, and division (National Research Council 2001).

Convinced by the literature as well as the outcomes we have seen with our students, we have made counting collections a fundamental part of what we do with young children at UES beginning the first week of school each fall. We hope this article will provide a window on the process of counting collections in our classrooms as well as evidence that every child in our classrooms can build his or her



Kindergarten — Addition and Subtraction Problem Types — Unit 1

Standards addressed by these problems: K.OA.2, K.OA.3, K.CC.2, K.CC.3, K.CC.4, K.CC.5, K.OA.3, K.OA.4, K.OA.5, K.CC.1*
**Teacher note, to address the standard K.CC.1 you will need to increase your numbers so the sum will equal up to 100.*

Overall purpose of these problem types: Students will use their understanding of counting and cardinality, operations, and algebraic reasoning (commutative property, associative property) to solve addition/subtraction problem types with numbers within 10. You can extend the counting sequence up to 100 at the same time by changing your numbers to values up to 100. Possible problems that can be used to address are JRU, JCU, SRU, SCU, PPW-WU, and PPW-PU.
(NOTE: Any of these problems can be used as a pre/post test or ongoing assessment of students' understanding.)

JRU (Join-Result Unknown):
Trinity has ___ rings. Her sister, Cori, gives her ___ more rings. How many rings does Trinity have now?
(4, 4) (4, 5)

JCU (Join-Change Unknown)
Matthew has ___ toy dinosaurs. He bought some more toy dinosaurs at Wal-Mart. Now, Matthew has ___ toy dinosaurs. How many toy dinosaurs did Matthew buy at Wal-Mart?
(2, 4) (5, 10)

SRU (Separate-Result Unknown)
Elliot had ____ tokens at Chuck-E-Cheese. He used ____ of his tokens to play games. How many tokens does Elliot have left?
(10, 2) (10, 3)

SCU (Separate-Change Unknown)
Derek had ____ marbles. He lost some of his marbles at recess. Now, Derek has ____ marbles left. How many marbles did Derek lose at recess?
(8, 4) (8, 3)

PPW-WU (Part-Part-Whole, Whole Unknown)
There were ___ sugar cookies and ___ peanut butter cookies on a plate. How many cookies were there altogether?
(3, 3) (4, 3)

PPW-PU (Part-Part-Whole, Part Unknown)
In Miss Melody's preschool class there were ____ kids in her classroom. ___ of the kids were three years old and the rest were four years old. How many of the kids in Miss Melody's class were four years old?
(10, 6) (7, 5)

Launch

-APK – Picture of baseball practice – What are they doing?
-Pose the problem – turn and talk about your strategy to solve

Students Independently Work

-Students work to solve the problem
-Teacher listens, notices and confers
-Teacher selects strategies to share

Discussion

-Compare and analyze strategies, mathematical understanding, notation, misconceptions, etc.
-How did they recognize "odd and even numbers"?
-Did they discover that certain numbers wouldn't give them "even number" of groups?

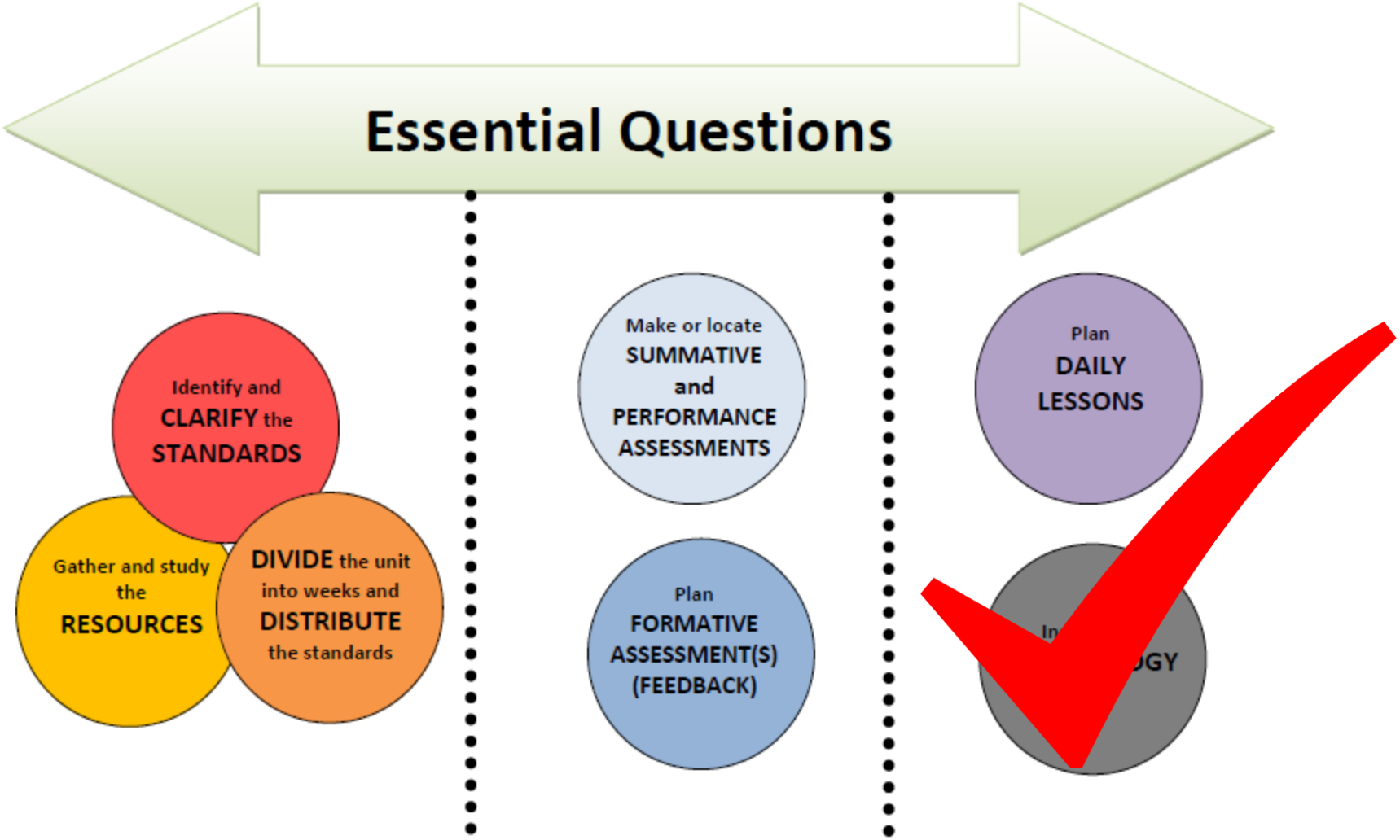
Plan
DAILY LESSONS

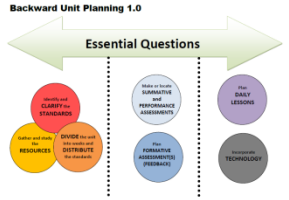
Incorporate
TECHNOLOGY

Online Resource –

Problem Solving Resources:
"Addition and Subtraction Problem Types"

Backward Unit Planning 1.0

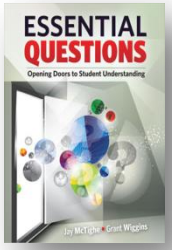




Essential Questions

1. ***How does counting help me solve problems?***
2. ***How can I show my thinking when solving story problems?***
3. ***What shapes do I see in the world around me?***
4. ***How can I sort these objects?***

Adapted with thanks to:



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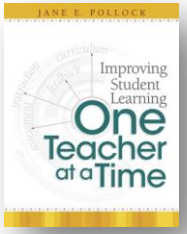

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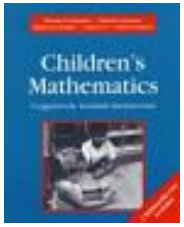

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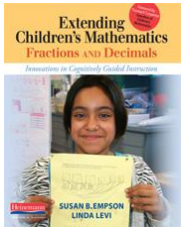

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