Using Place Value Strategies; Recognizing the Need for Standard Units of Measure; Relating Addition & Subtraction to Length

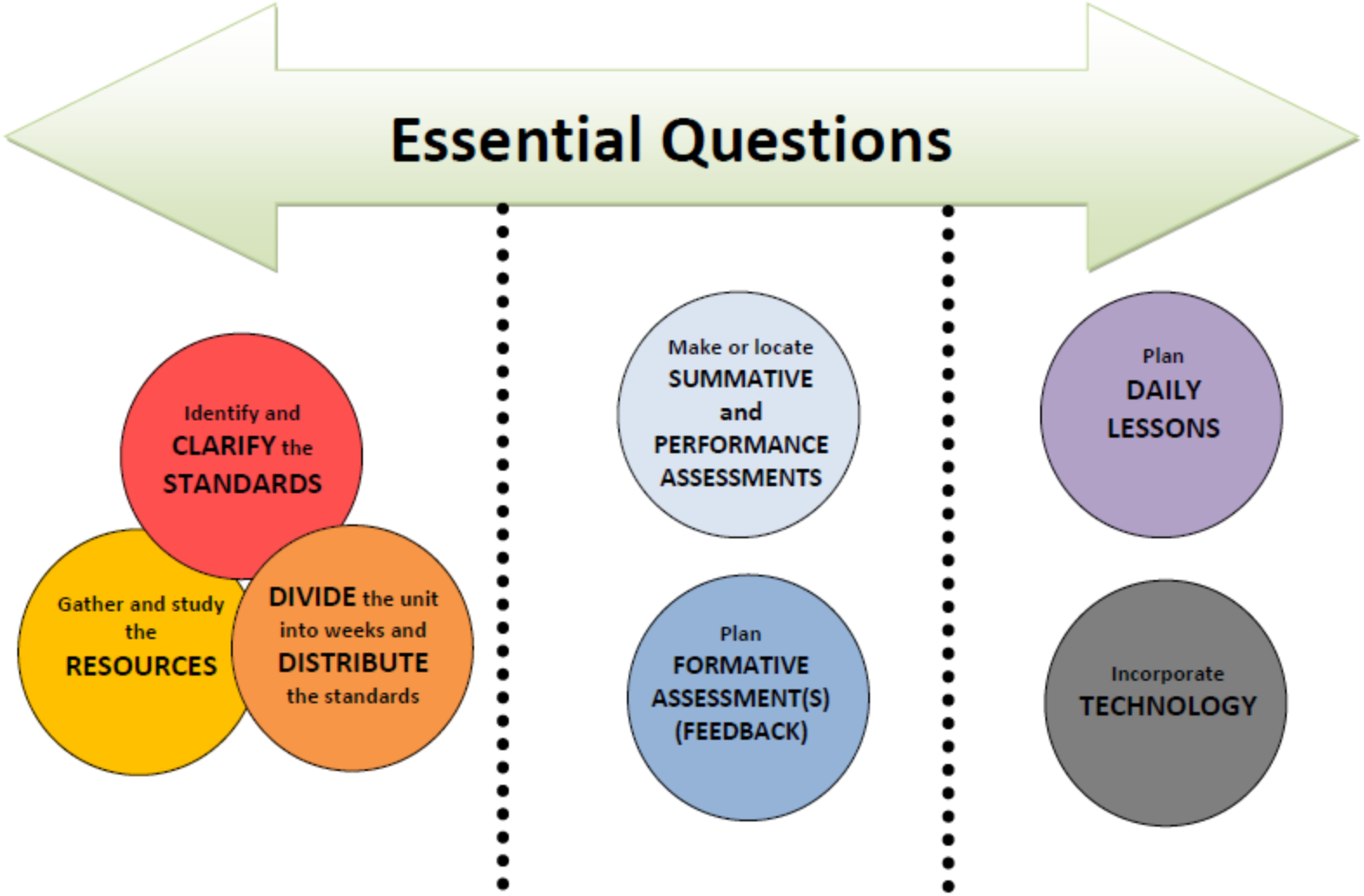
2nd Grade Unit 2

Unit Planning Team:

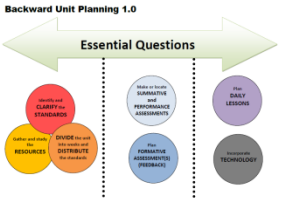
Brenda Hedrick (LW), Rea Smith (RG), Erica Bolin (RG),

Lottie Secker (BG), Kelli Piontek (FT)

Backward Unit Planning 1.0



Essential Questions



R.P.S. Common Core Math Curriculum | 2nd Grade

2nd Quarter (p. 1 of 2) **Using Place Value Strategies; Recognizing the Need for Standard Units of Measure; Relating Addition/Subtraction to Length** Students continue to develop their strategies for adding and subtracting. They will work to strengthen their fluency within 20 and within 100. They will use their understanding of place value to compare numbers and to explain why addition and subtraction strategies work. Students will apply their work in First Grade with non-standard units of measure and recognize the need for standard units of measure. They will also begin to recognize the relationship between the size of the unit used and the number of iterations needed. *(For example: the smaller the unit, the more iterations they need to cover a given length.)* Students will begin to apply their measurement experiences when creating number lines and representing their data through line plots. Experiences in measurement this quarter should lie heavily in developing the "need for standard units of measure" through the use of non-standard units and manipulatives. They will also extend their understanding of the units of time, telling and writing time to the nearest five minutes.

Essential Questions:

How can I use place value to compare numbers?

What should we consider when choosing a unit of measure?

How does the size of the unit affect the measure?

How do addition and subtraction relate to length?

Operations and Algebraic Thinking	
Represent and solve problems involving addition and subtraction	
2.OA.1	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
Add and subtract within 20	
2.OA.2	Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
Numbers and Operations in Base Ten	
Understand place value	
2.NBT.1	Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases: **a.** 100 can be thought of as a bundle of ten tens — called a "hundred." **b.** The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
2.NBT.2	Count within 1000; skip-count by 5s, 10s, and 100s.
2.NBT.3	Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
2.NBT.4	Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.
Use place value understanding and properties of operations to add and subtract	
2.NBT.5	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
2.NBT.6	Add up to four two-digit numbers using strategies based on place value and properties of operations.
	Minimum Quarterly Expectation: Add up to three 2-digit numbers
2.NBT.9	Explain why addition and subtraction strategies work, using place value and the properties of operations (explanations may be supported by drawings or objects).

How can I use place value to compare numbers?

What should we consider when choosing a unit of measure?

How does the size of the unit affect the measure?

How do addition and subtraction relate to length?

Operations and Algebraic Thinking

Represent and solve problems involving addition and subtraction

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Add and subtract within 20

2.OA.2	Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.

Numbers and Operations in Base Ten

Understand place value

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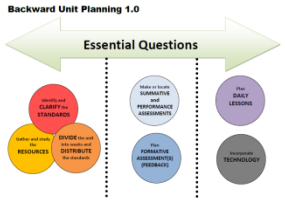
2.NBT.2	Count within 1000; skip-count by 5s, 10s, and 100s.
2.NBT.3	Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
2.NBT.4	Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.

Use place value understanding and properties of operations to add and subtract

2.NBT.5	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
2.NBT.6	Add up to four two-digit numbers using strategies based on place value and properties of operations. *Minimum Quarterly Expectation: Add up to three 2-digit numbers*
2.NBT.9	Explain why addition and subtraction strategies work, using place value and the properties of operations (explanations may be supported by drawings or objects).

2.NBT.4 - NEW this quarter (see next slide for our clarifications)
2.NBT.6 – CHANGED this quarter - increases from adding up to two 2-digit numbers in first quarter to adding up to three 2-digit numbers in second quarter

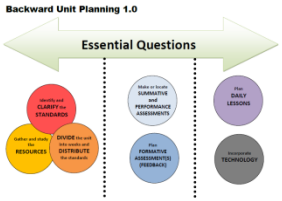


Identify and CLARIFY the STANDARDS

Standard	Clarifications on Continued Standards *Things We Want to Remember This Quarter*
2.OA.1	Pose 1 AND 2 step problems Pose varying problem types Continue to increase numbers Get deeper into subtraction
2.OA.2	Emphasize building on known facts (Number Talks as a resource)
2.NBT.1	Continue work on composing & decomposing numbers Continue posing multiplication & measurement division problems involving groups of 10 & 100
2.NBT.2	Keep increasing numbers Remember to start at non-decade numbers
2.NBT.3	Make meaningful connections to 2.NBT.1 and 2.NBT.2
2.NBT. 5 & 9	Try to move kids away from direct modeling and toward using place value and properties of operations – and explain why those strategies work

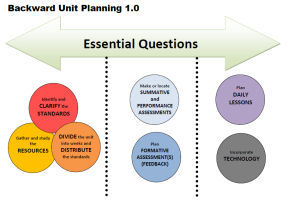
Measurement and Data	
Measure and estimate lengths in standard units	
2.MD.2	Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.
2.MD.4	Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
Relate addition and subtraction to length.	
2.MD.5	Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.
2.MD.6	Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a line diagram.
Work with time and money.	
2.MD.7	Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
Represent and interpret data.	
2.MD.9	Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

*Experiences in measurement this quarter should lie heavily in developing the "need for standard units of measure" through the use of non-standard units and manipulatives that are of "standard" length (like centimeter cubes, inch cubes/tiles, etc). Measurement using tools, such as a ruler, will come in 3rd quarter.



Identify and CLARIFY the STANDARDS

Standard	Clarifications on NEW Standards *Things We Want to Remember This Quarter*
2.NBT.4	We want to connect comparisons to decomposing numbers based on place value (2.NBT.1 & 2.NBT.3) and to the idea of comparing measurements (2.MD.4)
2.MD.2	Our summary "the smaller the unit, the more it will take"
2.MD.4	We want to connect this idea of comparing measurements to comparing numbers (2.NBT.4) and solving comparison problems (2.OA.1). *express the length difference in terms of a NON-STANDARD length unit in 2nd Quarter*
2.MD.5	NO RULER until 3rd quarter "lengths that are given in the same units" means non-standard units (paperclips, steps, etc.)
2.MD.6	Connection to strategies for solving addition and subtraction problems (2.OA.1 and 2.OA.2) Deep understanding of whole numbers on the number line will help when they learn fractions on the number line in 3rd grade
2.MD.	Progresses from hours and half hours in 1st grade
2.MD.9	Once students measure an object or distance and a class line plot is created, we see almost all the standards in this unit could be addressed (especially 2.MD.2, 2.MD.4, 2.MD.5, 2.MD.6)



Suggested Weekly Posing of Problems:

This is one way to think about clustering the standards. These ideas would be repeated each week.

Essential Question: How Can I Use Place Value to Compare Numbers?

1-2 days a week- Continue developing understanding of place value by composing and decomposing numbers and by posing multiplication and measurement division problems with groups of 10 and 100. Begin to compare numbers by applying place value understanding. (2.NBT.1, 2.NBT.2, 2.NBT.3, 2.NBT.4)

DIVIDE the unit into weeks and DISTRIBUTE the standards

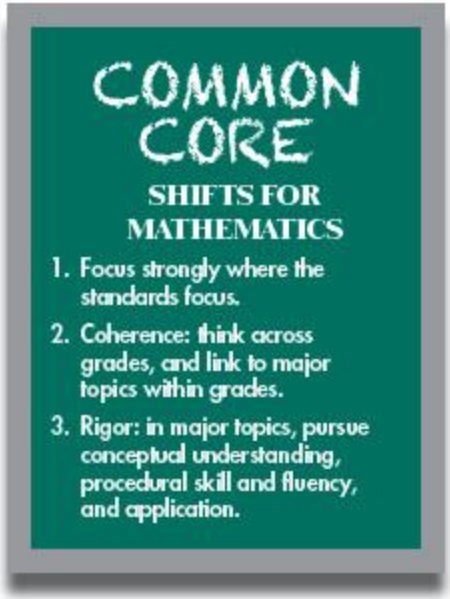
Essential Questions: What should we consider when choosing a unit of measure? How does the size of the unit affect the measure?

2-3 days a week- Work on measurement ideas using non-standard units in order to push students to generate the need for standard units of measure and to solidify important features of measure before students begin to use standard units in 3rd Quarter. (2.MD.2, 2.MD.4, 2.MD.9)

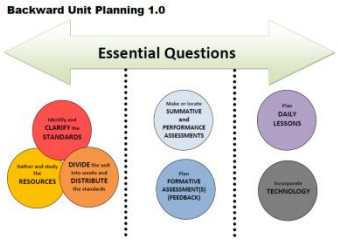
Essential Question: How do addition and subtraction relate to length?

2-3 days a week- Connect and extend addition and subtraction work from 1st Quarter to length. (2.OA.1, 2.OA.2, 2.NBT.5, 2.NBT.6, 2.NBT.9, 2.MD.5, 2.MD.6, 2.MD.9)

Because working with time (2.MD.7) is a "yellow/additional" cluster, we chose to do a daily time check/mini-lesson, rather than devoting entire lessons to telling time.

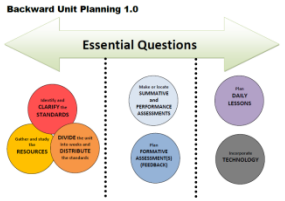


Week	Standards	Structure/Resources
1	**2.OA.1** **2.NBT.5** **2.NBT.9** **2.MD.2, 2.MD.9** **2.NBT.1 , 2.NBT.2, 2.NBT.3** **2.OA.2** **2.MD.7**	2.OA.1 1-2 times per week; Multiplication and Measurement Division Problems in groups of 10; Pose problem types to students based on student needs. Look for invented strategies to pull out in discussion. Rich Lehr Measurement Units Morning Math / Daily Practice/Time Check Number Talks
2	**2.OA.1** **2.NBT.5** **2.NBT.6 (every other week)** **2.NBT.9** **2.MD.2, 2.MD.9** **2.NBT.1 , 2.NBT.2, 2.NBT.3** **2.OA.2** **2.MD.7**	2.OA.1 1-2 times per week; Multiplication and Measurement Division Problems in groups of 10; Pose problem types to students based on student needs. Look for invented strategies to pull out in discussion. **2.NBT.6 – add up to 3 two digit numbers** Rich Lehr Measurement Units Morning Math/ Daily Practice/Time Check Number Talks
3	**2.OA.1** **2.NBT.5** **2.NBT.9** **2.MD.4, 2.MD.9 (tie in 2.NBT.4)** **2.NBT.1 , 2.NBT.2, 2.NBT.3, 2.NBT.4** **2.OA.2** **2.MD.7**	2.OA.1 1-2 times per week; Multiplication and Measurement Division Problems in groups of 10; Pose problem types to students based on student needs. Look for invented strategies to pull out in discussion. Rich Lehr Measurement Units Morning Math/ Daily Practice/Time Check Number Talks



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

Week	Standards	Structure/Resources
4	**2.OA.1 / 2.MD.5** **2.NBT.5** **2.NBT.6** **2.NBT.9**	2.OA.1 1-2 times per week; Multiplication and Measurement Division Problems in groups of 10; Pose problem types to students based on student needs. Look for invented strategies to pull out in discussion. 2.NBT.6 – add up to 3 two digit numbers **2.MD.5 – word problems involving lengths – use non-standard units to measure**
	2.MD.4, 2.MD.9 (tie in 2.NBT.4)	Rich Lehr Measurement Units
	2.NBT.1, 2.NBT.2, 2.NBT.3, 2.NBT.4 **2.OA.2** **2.MD.7**	Morning Math/ Daily Practice/Time Check Number Talks
5	**2.OA.1 / 2.MD.5** **2.NBT.5** **2.NBT.9**	2.OA.1 1-2 times per week; Multiplication and Measurement Division Problems in groups of 10; Pose problem types to students based on student needs. Look for invented strategies to pull out in discussion. 2.MD.5 – word problems involving lengths – use non- standard units to measure
	2.MD.6	Context For Learning - Ages and Timelines
	2.NBT.1, 2.NBT.2, 2.NBT.3 **2.OA.2** **2.MD.7**	Morning Math/ Daily Practice/Time Check Number Talks
6	**2.OA.1 / 2.MD.5** **2.NBT.5** **2.NBT.6** **2.NBT.9**	2.OA.1 1-2 times per week; Multiplication and Measurement Division Problems in groups of 10; Pose problem types to students based on student needs. Look for invented strategies to pull out in discussion. 2.NBT.6 – add up to 3 two digit numbers 2.MD.5 – word problems involving lengths – use non-standard units to measure
	2.MD.6	2.MD.6 Context For Learning - Ages and Timelines
	2.NBT.1, 2.NBT.2, 2.NBT.3 **2.OA.2** **2.MD.7**	Morning Math/ Daily Practice/Time Check Number Talks



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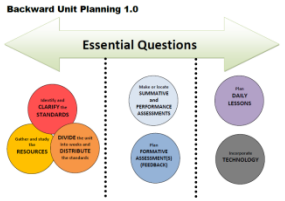
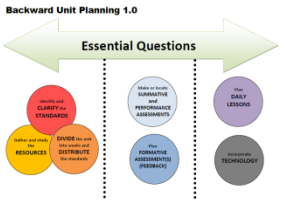
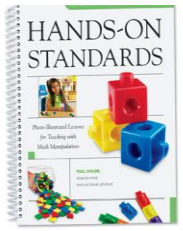
Week	Standards	Structure/Resources
7	**2.OA.1** **2.NBT.5** **2.NBT.9** **2.MD.6** **2.NBT.1 – 3** **2.MD.7** **2.OA.2**	2.OA.1 1-2 times per week; Multiplication and Measurement Division Problems in groups of 10; Pose problem types to students based on student needs. Look for invented strategies to pull out in discussion. 2.MD.6 – Contexts for Learning – Ages and Timelines Morning Math/ Daily Practice/Time Check Number Talks
8	**2.OA.1** **2.NBT.5** **2.NBT.6** **2.NBT.9** **2.MD.6** **2.NBT.1 – 3** **2.MD.7** **2.OA.2**	2.OA.1 1-2 times per week; Multiplication and Measurement Division Problems in groups of 10; Pose problem types to students based on student needs. Look for invented strategies to pull out in discussion. 2.MD.6 – Contexts for Learning – Ages and Timelines Morning Math/ Daily Practice/ Time Check/ Number Talks
9	**2.OA.1** **2.NBT.5** **2.NBT.9** **2.NBT.1-3** **2.MD.7** **2.OA.2**	2.OA.1 1-2 times per week; Multiplication and Measurement Division Problems in groups of 10; Pose problem types to students based on student needs. Look for invented strategies to pull out in discussion. Morning Math/ Daily Practice/ Time Check/ Number Talks

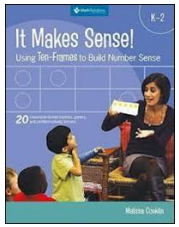


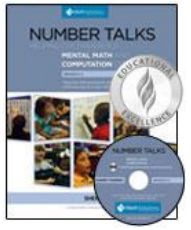
DIVIDE the unit into weeks and **DISTRIBUTE** the standards

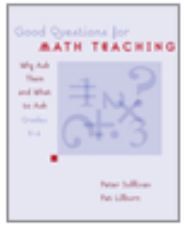
Gather and study the RESOURCES

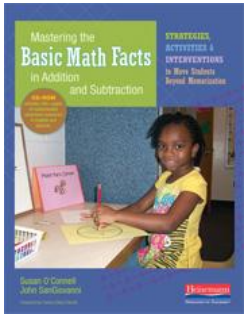


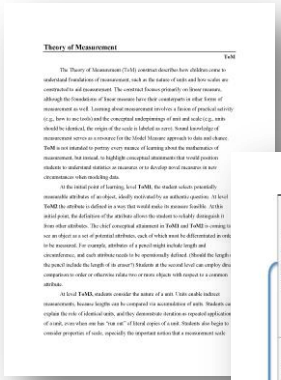


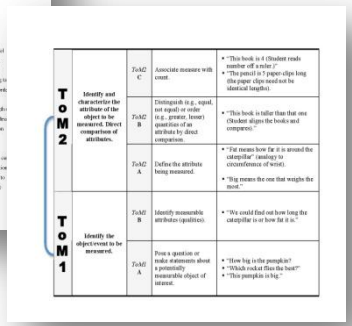


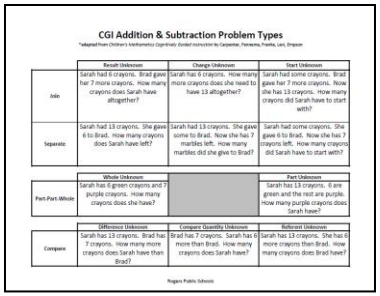






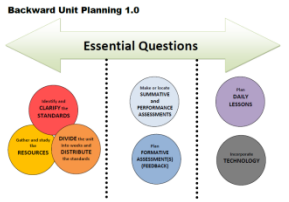






Summative Assessment *is designed and administered to "sum up" learning that has taken place during a lesson, a unit, or a course.*

- Anne R. Reeves



Essential Question 1

How can I use place value to compare numbers?

Make or locate SUMMATIVE and PERFORMANCE ASSESSMENTS

Illustrative Mathematics

2.NBT Comparisons 1

Alignments to Content Standards

- Alignment: 2.NBT.A.4

Tags

- *This task is not yet tagged.*

Are these comparisons true or false?

a. 2 hundreds + 3 ones > 5 tens + 9 ones

b. 9 tens + 2 hundreds + 4 ones < 924

c. 456 < 5 hundreds

d. 4 hundreds + 9 ones + 3 ones < 491

e. 3 hundreds + 4 tens < 7 tens + 9 ones + 2 hundred

f. 7 ones + 3 hundreds > 370

g. 2 hundreds + 7 tens = 3 hundreds - 2 tens

Illustrative Mathematics

2.NBT Using Pictures to Explain Number Comparisons

Alignments to Content Standards

- Alignment: 2.NBT.A.4

Tags

- *This task is not yet tagged.*

Compare each pair of numbers. Write your comparison using $<$, $=$, or $>$ and in words. Explain your answer with a picture.

a. 99 and 100

b. 154 and 231

c. 453 and 428

d. 351 and 354

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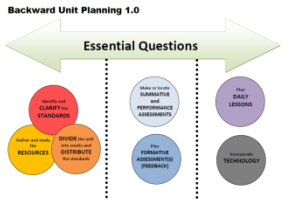

Essential Question 2

What should we consider when choosing a unit of measure?

Make or locate SUMMATIVE and PERFORMANCE ASSESSMENTS

Marco measured how tall his table was. He says his table is 3 books tall.
Do you agree with Marco? Fill in one of the boxes below.

I **agree** with Marco because	or	I **disagree** with Marco because

Properties of Units of Length Measure (Grade K) 7/03/13

Instruction Comparing Lengths U

Formative Assessment

1. Provide the child with a block of wood that is approximately 12 inches long, with "worms" that are 1 inch, 2 inches, and 4 inches long. Ask each student to find and record the measure of the length of the block of wood in a way so that someone else who read the measurement could use it to draw a line exactly the same length as the block of wood: "Just like we did in class when we had to draw a line exactly the same as someone else's."

2. The second problem is a compare difference unknown, with numbers and manipulative aides provided by the teacher. The teacher reads the problem to the group or to individuals who have different number values filled in:

   Ricardo's rope is ____ feet long and Yostena's is ____ feet long. How much longer is Yostena's rope?

Comparing Path Lengths
Measuring the Length of a Desk
Teacher's Secret Line
Mystery Line
Formative Assessment

Student _____ Date _____

Indicate the levels of mastery demonstrated for measuring the block of wood by circling those for which there is clear evidence:

Level	Description	Notes
ToM3B	Child uses identical units of measure or labels non-identical units. Labels unit(s)? Yes or No (*Circle one)*	
ToM3A	Child's method for measuring leaves no gaps.	
ToM2E	Child represents measure with a number.	
ToM2A	Identifies length of the block of wood. *Circle those that apply:* Yes No Other _____	
NL	Does not know how to measure or cannot make any sense of the task.	

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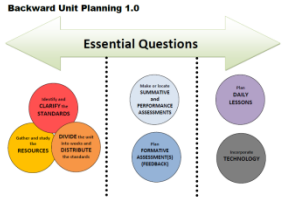


Essential Question 3

How does the size of the unit affect the measure?

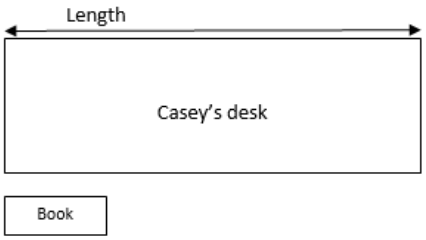
Make or locate SUMMATIVE and PERFORMANCE ASSESSMENTS

1. (2.MD.2) Jim measured the carpet in the classroom with his planner and then with a crayon. He got these two measurements: 25 and 12.

   Which measurement was the planner and which was the crayon?
   (Write crayon or planner in the blank)
   25 _____
   12 _____

   Why were the measurements different?

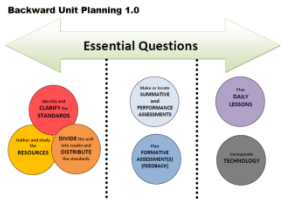
2. (2.MD.2) Casey wants to find the length of her desk with one book, but her book is not as long as her desk.



   Can Casey use only one book to measure her desk? Explain.

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



Essential Question 4

How do addition and subtraction relate to length?

2.MD Frog and Toad on the number line

Alignments to Content Standards

- Alignment: 2.MD.B.6

Tags

- *This task is not yet tagged.*

One day, Frog and Toad were sitting together on a lily pad. Some lily pads were in a line across the pond.

In the morning, Frog hopped three lily pads away. In the afternoon, he hopped two more away. In the evening, he hopped another two more.

Toad hopped four lily pads away in the morning. He rested in the afternoon and continued three further in the evening. Frog said,

Toad, we ended up at the same place!

Show each of their journeys on a number line, starting at 0. Use different colors for the morning, afternoon, and evening hops. Write a number sentence that reflects that they ended up at the same place.

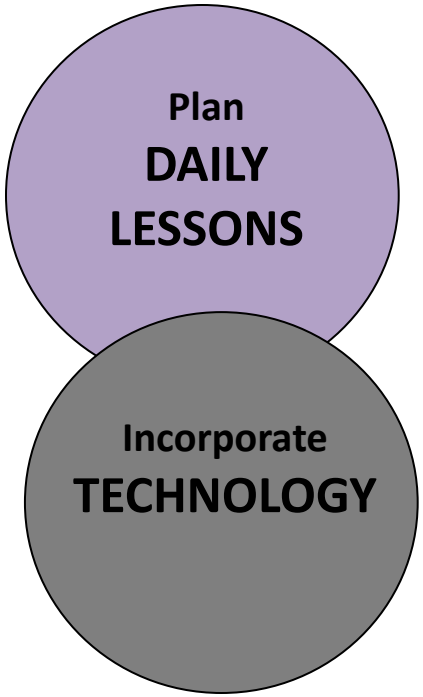
Make or locate SUMMATIVE and PERFORMANCE ASSESSMENTS

Pose a Compare Problem

Example – Compare Difference Unknown

Luke's desk is _____ paperclips long and Jasmine's is _____ paperclips long. How much longer is Jasmine's desk?

Monday Week 1	Tuesday Week 1	Wed. Week 1	Thurs. Week 1	Friday Week 1
Measurement **Formative Assessment from online*** **Daily:** **2.MD.7 (time)** **2.OA.2 (facts)** **2.NBT.1-3 (place value)**	**Measurement** **2.MD.2, 2.MD.9** Daily: 2.MD.7 2.OA.2 2.NBT.1 - 3	**Measurement** **2.MD.2, 2.MD.9** Daily: 2.MD.7 2.OA.2 2.NBT.1 - 3	Problem solving 2.OA.1 (+ or – word problem) 2.NBT.5, 9 Daily: 2.MD.7 2.OA.2 2.NBT.1 - 3	Problem Solving 2.NBT.1,2,3 (these 3 play off each other) Mult. or Measurement Division problem Daily: 2.MD.7 2.OA.2 2.NBT.1 - 3



LESSONS AND RESOURCES ARE AVAILABLE ONLINE.

Plan
DAILY LESSONS

Incorporate
TECHNOLOGY

NEW Teacher Created Resources pages!!!

RESOURCES

Beth Pesnell
Elementary Curriculum Specialist
bpesnell@rps.k12.ar.us