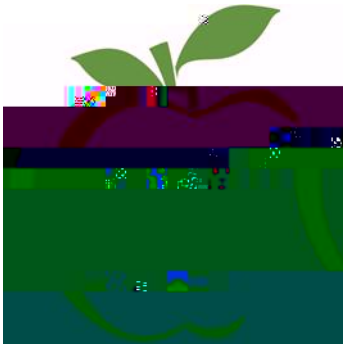


Session #1, October 2014

Grade 2

Content Standards

Standards for Mathematical Practice

California Mathematical Framework

Kansas CTM Flipbook

Learning Outcomes

Sample Assessment Items

Grade 2

Represent and solve problems involving addition and subtraction.

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.[1]

Add and subtract within 20.

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

Common Core State Standards – Mathematics
Standards for Mathematical Practice – 2nd Grade

Standard for Mathematical Practice	2nd Grade
1: Make sense of problems and persevere in solving them. Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous prob and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older	

3: Construct viable arguments and critique the reasoning of	Second graders may construct
Mathematically proficient students understand and use stated assumptions, definitions, and	arguments using concrete
previously established results in constructing arguments. They make conjectures and build a	referents, s
logical progression of statements to explore the truth of their conjectures. They are able to	
analyze situations by breaking them into cases, and can recognize and use counterexamples.	
They justify their conclusions, communicate them to others, and respond to the arguments of	
others. They reason inductively about data, making plausible arguments that take into account	
the context from which the data arose. Mathematically proficient students are also able to	
compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning	
from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary	
students can construct arguments using concrete referents such as objects, drawings, diagrams,	
and actions. Such arguments can make sense and be correct, even though they are not	
generalized or made formal until later grades. Later, students learn to determine domains to	
which an argument applies. Students at all grades can listen or read the arguments of others,	
decide whether they make sense, and ask useful questions to clarify or improve the arguments.	

7: Look for and make use of structure. Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7×8 equals the well remembered $7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $2x + 9x + 14$, older students can see the 14 as 2×7 and the 9 as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 - 3(x - y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.	Second graders look for patterns For instance, they adopt mental math strategies based on patterns (making ten, fact families, doubles).
8: Look for and express regularity in repeated reasoning. Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.	Students notice repetitive action in counting and computation, etc. When children have multiple opportunities to add and subtract, they look for shortcuts, such as rounding up and then adjusting the answer to compensate for the rounding. Students continually check their work by asking themselves,-Does this make sense?

Understand place value.

These have the same value:	Six hundreds is the same as 600:
Using Math Drawings:	
When I bundle 10 “ten-sticks” I get 1 “hundred-flat.”	The picture shows 3 hundreds, or 300.

As students represent various numbers, they associate number names with number quantities (MP.2). For example, 243 can be expressed as both “2 groups of hundred, 4 groups of ten and 3 ones” and “24 tens and 3 ones.” Students can read number names as well as place value concepts to say a number. For example, 243 should be read as “two hundred forty-three” as well as “2 hundreds, 4 tens, and 3 ones.” Flexibility with seeing a number like 240 as “2 hundreds and 4 tens” as well as “24 tens” is an important indicator of place-value understanding.

In kindergarten, students were introduced to counting by tens. In second grade they extend this to skip count by 2s, 5s, 10s and 100s (2.NBT.2 x) . Exploring number patterns can help students skip count. For example, when skip counting by 5s, the ones digit alternates between 5 and 0, and when skip counting by 10s and 100s, only the tens and hundreds digits change, increasing by one each time. In this way, skip counting can reinforce students’ place value understanding. Work with skip counting lays a foundation for multiplication;

303 comparisons in words before using only symbols to indicate greater than, less
304 than, and equal to.
305

Example: Compare 452 and 455.
Student 1: Student might explain 452 has 4 hundreds 5 tens and 2 ones and 455 has 4 hundreds 5 tens and 5 ones. They have the same number of hundreds and the same number of tens, but 455 has 5 ones and 452 only has 2 ones. So, 452 is less than 455 or 452 < 455.
Student 2: Student might think 452 is less than 455. I know this because when I count up I say 452 before I say 455.

306
307 As students compare numbers they also develop mathematical practices such as
308 making sense of quantities (MP.2), understanding the meaning of symbols
309 (MP.6), and making use of number patterns and structures in the number system
310 (MP.7).
311

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

5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
6. Add up to four twodigit numbers using strategies based on place value and properties of operations.
7. Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship b(hn-1.9(e)-3(v)-5.5/2T1.....(e)-3(

Cluster:

Domain:	Number and Operations in Base Ten (NBT)

Cluster:

Domain: Number and Operations in Base Ten (NBT)
Cluster: Understand place value.
Standard: 2.NBT.3 . Read and write numbers to 1000 using base -ten numerals, number names, and expanded form.
Standards for Mathematical Practices (MP) to be emphasized: MP.2. Reason abstractly and quantitatively. MP. 6 Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning.
Connections: See 2.NBT.1
Explanations and Examples: 2.NBT.3 calls for students to read, write and represent a number of objects with a written numeral (number form or standard form). These representations can include place value (base 10) blocks, pictorial representations or other concrete materials. Remember that when reading and w U L W L Q J Z K R O H Q X P E H U V ´ W K H Z R U G and should not be used. Example : 235 is written as two hundred thirty -five. Students need many opportunities reading and writing numerals in multiple ways. Examples : x Base-ten numerals 637 (standard form) x Number names six hundred thirty seven (written form) x Expanded form 600 + 30 + 7 (expanded notation) :KHQ VWXGHQWV VD\ WKH H[SDQGHG IRUP LW PD\ plus 3 tens OL SOXV RQHV´ 25 SOXV SOXV ´

Domain: Number and Operations in Base Ten (NBT)
Cluster: Understand place value.
Standard: 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.
Standards for Mathematical Practices (MP) to be emphasized: MP.2. Reason abstractly and quantitatively. MP.6. Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning.
Connections: See 2.NBT.1

Explanations and Examples:

2.NBT.4 builds on the work of 2.NBT.1 and 2.NBT.3 by having students compare two numbers by examining the amount of hundreds, tens and ones in each number. Students are introduced to the symbols greater than (>), less than (<) and equal to (=) in First Grade, and use them in Second Grade with numbers within 1,000. Students should have ample experiences communicating their comparisons in words before using only symbols in this standard.

Example: 452 __ 455

2.NBT. 1-4

SEQUENCE OF LEARNING OUTCOMES FROM CURRICULUM MAP

1.) Understand that a three-digit number represents amounts of hundreds, tens, and ones. 2.NBT.1

2.) Represent numbers within 1000 in multiple ways, (e.g., 103 = 10 tens and 3 ones; 310 = 9 tens and 13 ones). 2.NBT.1

3.) Understand that 100 = 1 hundred and no tens and no ones, 200 = 2 hundreds and no tens and no ones… 2.NBT.1b

4.) Count within 1000 by 1s, 2s, s, 10s, and 100s. 2NBT.2

5.) Read and write numbers to 1000 including number names. 2.NBT.3

6.) Read and write numbers to 1000 using expanded form. 2.NBT.3

7.) Compare three-digit numbers within 1000 based on place-value, including the use of comparison symbols. 2.NBT.4

LEARNING OUTCOMES FROM envision TOPIC 10

LESSON:

10-1 Count by hundreds to 1000. 2.NBT.1a, 2.NBT.1b, 2.NBT.2

10-2 Use place value models to show numbers up to 1000.
2.NBT.1a, 2.NBT.1b, 2.NBT.3

10-3 Identify and record threedigit numbers in expanded form, standard form, and number word form. 2.NBT.1a, 2.NBT.1b, 2.NBT.3

10-5 Find, identify, and apply number patterns to numbers on a hundred chart.
2.NBT.2 (-digit numbers using the symbols <, =, >. 2.NBT.4

Solve problems by finding number patterns. 2.NBT.2, 2.NBT.4

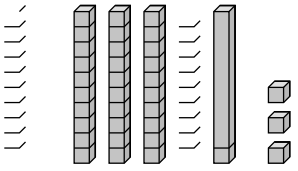
0COG

/CTM VJG DGUV CPUYGT

9JCV PWODGT KU QP9GJKEJ PWODGT KU DGHQTG ! VJKTV[UGXGP!

9JKEJ UJQYU JQY VQ9JCV PWODGT KU QP EQORCTG CPF ! CHVGT !

9JCV PWODGT FQGU VJG RKEVWTG UJQY



0 C O G

9 J C P W O D K G U T
O Q T V G J C P !

9 J C P W O D K G U T
N G V J U C P !

ESSENTIAL QUESTIONS

- How can place value help us tell which of two or more numbers is greater?
- Why should you understand place value?
- What are different ways we can show or make (represent) a number?
- What is the difference between place and value?

MATERIALS

- Carol's Number's

GROUPING

Individual

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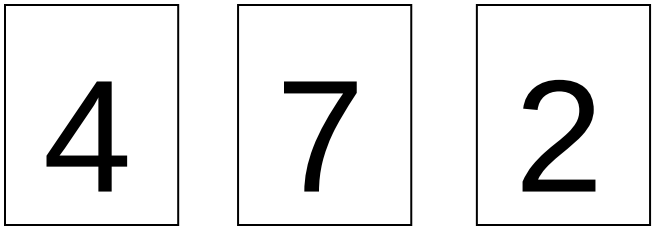
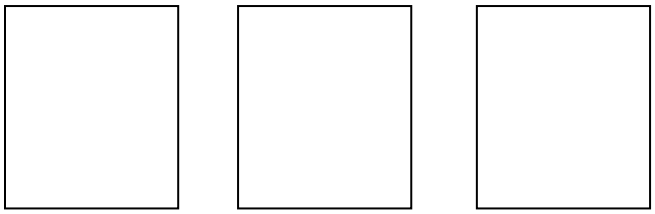
Name _____ Date: _____

CAROL'S NUMBERS - Part I – NBT1

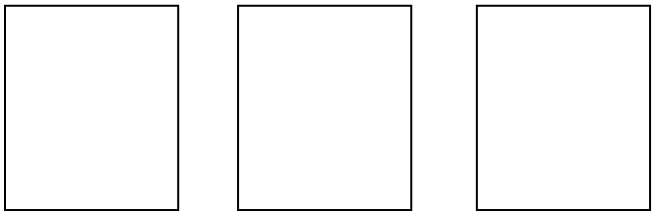
Carol has three number cards.



1. What is the largest three- digit number Carol can make with her cards?



2. What is the smallest three- digit number Carol can make with her cards?



3. Explain to Carol how she can make the smallest possible number using her three cards .

_____

_____

_____

_____

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8. Carol decided to start counting at 28 because that was the date today. She counted by tens this time. What comes next?

28, _____, _____, _____, _____, _____, _____

9. Carol jumped rope five times. She skip counted by 100 as she jumped. Think about the numbers she called out. Which place changes and which places stay the same? Explain your answer. (NBT.1)

_____

_____

_____

Carol's Numbers - Part 3 – NBT 3

10 – 12. Help Carol write in expanded notation. Write the following numbers

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Carol's Numbers - Part 4 – NBT 4

15 – 17. Carol and Mya collect stickers. They each have three books of stickers. They wrote down the number of stickers they had in each book.

Use the symbols <, >, and = to compare the number of stickers that they have.

& $ 5 2 / · 6 STICKERS	>, <, or =	0 < $ · 6 STICKERS
345		342
99		102
580		508

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