YALE NATIONAL INITIATIVE
to strengthen teaching in public schools®

Curriculum Units by Fellows of the National Initiative
2015 Volume V: Problem Solving and the Common Core

Taking the Problems out of Story Problems

Curriculum Unit 15.05.01, published September 2015
by Corrina Christmas

Overview

This is my tenth year teaching first grade in what is considered a low performing school in northeast Tulsa, Oklahoma. It is a high poverty, Title One school where 90% of the population qualifies for free breakfast and lunch. We have a diverse population of about 300 students, with forty percent African American, thirty-four percent Hispanic, eleven percent Caucasian, and ten percent multiracial. Some parents can't read and most of those who do read have minimal education or understanding of the higher level thinking that is required of 1st graders today. Over half of my students do not receive any help on homework or reading at home. Sometimes this is due to parents not understanding how to help them; sometimes it is because their parents work long hours, or students spend their night time with day care or babysitters. Most students come to 1st grade well below grade level in reading and math! Students do not have the foundational skills they need to be able to add and subtract, or even read the questions fluently. Some students come in not being able to count above 20, or recognize any of their written numerals. In addition, even when a story problem is read to them, students do not comprehend what the problem is asking them to do, or even where to begin. They do not know how to set up the equation, or understand how to figure out whether to add or subtract.

Rationale

Every year my students struggle with story problems and never really develop the ability to solve them even though they master addition and subtraction facts. EVERY YEAR! Why does this happen? Why can they not transfer what they know about addition and subtraction facts to written story problems?

Story problems are a challenging topic in first grade, even for students who are reading on grade level. First grade students are just learning to add and subtract, so doing story problems is even more difficult since they must first be able to read the problems. Once they can read, the student then must decide what the problem is asking them to do. Next, they must set up the equation, and finally solve the problem. This is a lot to ask of 1st graders and even 2nd graders.

I believe by starting story problems the very first week (with problems being read by me and then having students echo read the problem) and keeping the theme the same in the problems will help build their confidence and comprehension of math story problems and reading.

Why are story problems so hard! How can I teach it so that my students have a better understanding of what the problem is asking them? I will introduce my students to all of the fourteen types of one step addition and subtraction problems described in the Common Core taxonomy1. I will start at the beginning of school (I will read the problem and the students will then echo read the problem) and have a story problem time of day at the beginning of math every day. We will keep the theme of the problem the same for many days, but will vary the type of problem. I will lead class discussions that will give students a chance to make conclusions about how the problems are alike or different, paying close attention to inverse operations. I will ask my class, "Should we add or subtract?", and have students explain their choices, then come to a final (correct) decision with a "How do you know" discussion.

In my current curriculum, the theme of the problem changes daily and this causes students to spend so much time trying to decode the words in the problem, that they forget what the problem is asking them to do. For students to truly have an understanding of story problems they must first internalize the concepts of addition and subtraction. Memorization of facts will not accomplish this, instead students must learn to compose (put together) and decompose (taking apart) numbers. Fluency of math facts and reading will only come with time and practice, and both can be promoted through class discussion of word problems.

Objectives

My students usually come to my class well below grade level in reading and math, and to address the low math scores I will also address the reading skills. My students who are low in reading and comprehension, also struggle in math because there is a great deal of reading that goes along with math.

My goal in this unit is to give my students a good foundation for solving addition and subtraction story problems that will prepare them for the upper grades with the knowledge they will need to be successful in mathematics.

My unit will address all of the Common Core standards2 listed below, in addition to reading and comprehension skills.

Common Core Standard 1.OAA.1,Using addition and subtraction to solve problems with in twenty, in all situations including putting together, taking apart, and comparing two and three quantities with unknowns in all positions. This unit will also be working on other standards, including 1.OA.B.4: Understand subtraction as an unknown addend problem and some of the place value standards – 1.NBT.B.2 (which has A, B and C parts) and 1.NBT.C.4, adding within 100.

These are the main standards that I had in mind while writing this unit. It includes all six change problems, all six comparing problems, and both part, part, whole problems.

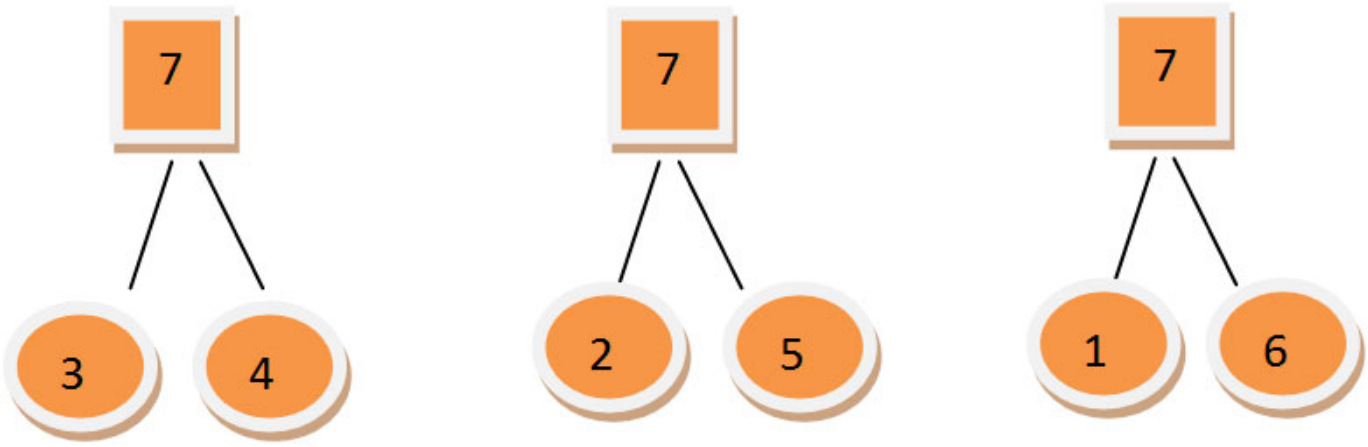
I will be relating addition to subtraction to make sure the students understand that they are inverse operations, and help students make the connections to the associative and commutative properties in word

and linear problems. I will tell my students, "It doesn't matter in which order we add two numbers, or if we have three numbers to add, it doesn't matter which two we add first". Understanding the inverse relationship between addition and subtraction will help students to master all math objectives in the first grade.

Mathematical Background

Decomposing Numbers

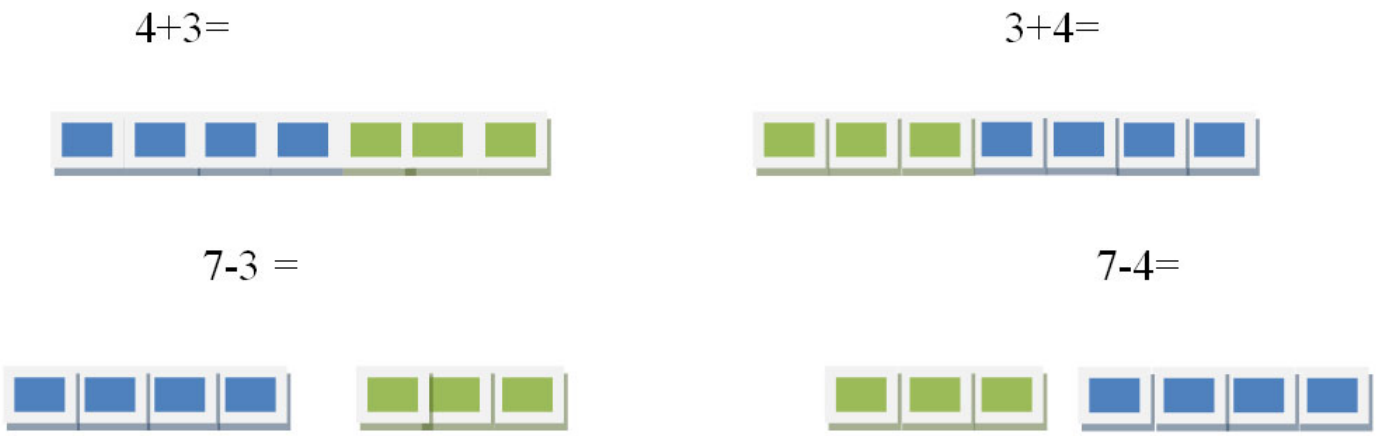
Decomposing numbers is the first step in learning addition and subtraction. This step cannot be skipped! Students cannot learn to add and subtract numbers if they don't know what makes up each of those numbers. Decomposing a number is just breaking down a number by finding out what other numbers make that number. For Instance the number 7 may be decomposed into 3 and 4, or 2 and 5, or 1 and 6.



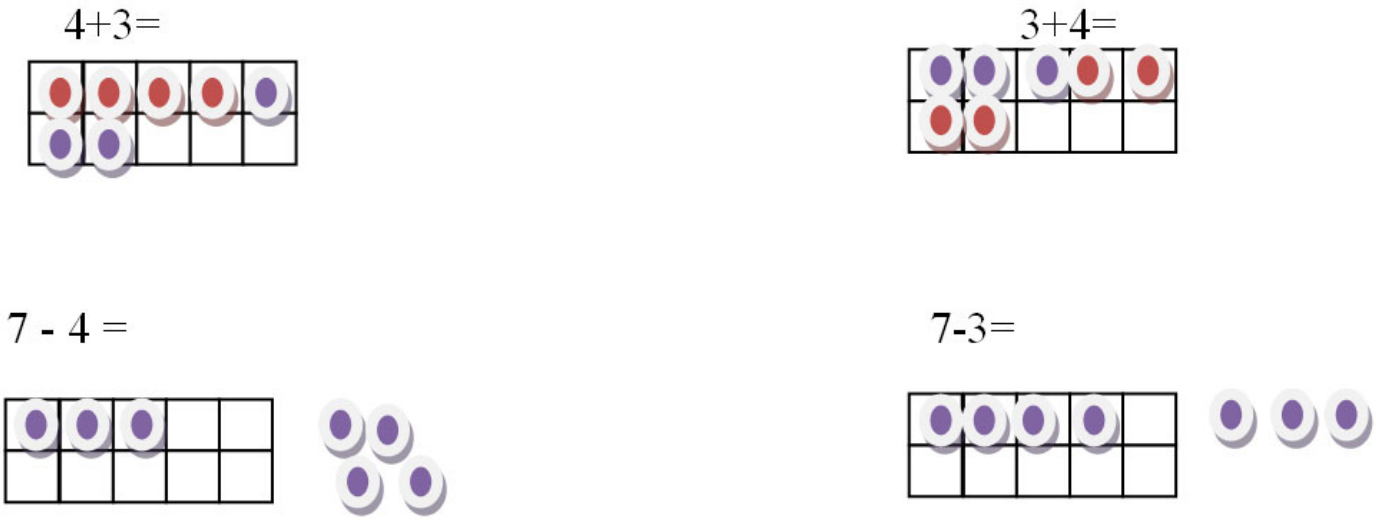
Adding and Subtracting Numbers to Ten

There are three types of problems to learn while adding and subtracting numbers to ten. The types are sum (addition), difference (subtraction) and missing addend (one of the numbers being added or subtracted in missing) and students must understand how to work each type.

Addition and subtraction are the foundational skills for teaching story problems and must be taught so they can internalize the importance of inverse operations. They must understand that 5+4 =9 is the same as 4 + 5 = 9, and the inverse operation: if you have 9 and you get rid of 4, what is left is 5. They need visual representation of these concepts and they need to be able to physically move objects to see them making the numbers. I will begin with putting unifix cubes together to make "trains" and taking them apart and then we will move to tens blocks.



The tens frame is a visual representation that helps students add and subtract because they are physically moving the counters. On addition they can see the joining happening by moving the counters and on subtraction they physically move the counters out of the tens frames.



Students need to master all of the different ways of putting numbers together and taking numbers apart within ten before moving to the next step. We will spend at least four weeks on this step alone since it is the foundational skill for all other skills in mathematics. During this step we will also discuss ways to decompose each number we are working on, this will help with fluency of facts and get them ready for doing numbers above ten later.

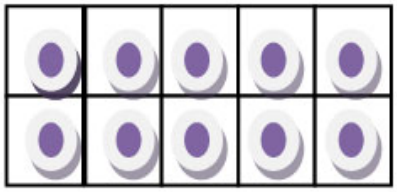
Breaking Teen Numbers into Tens and Ones

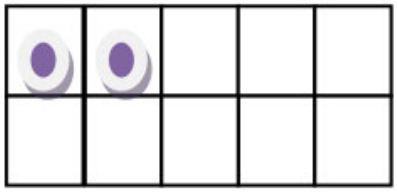
Teen numbers can be quite confusing for younger students. Numbers like fifty-five are easier to break apart because the name tells us there are fifty, meaning five groups of ten, and the five, meaning five ones. With numbers like fourteen students want to think that it is four tens because the word four comes first in fourteen. If the numbers with the word teen in them aren't confusing enough, we (English speakers) have the numbers like eleven and twelve that don't even have the word teen in them. The non-English speaking students have even more difficulties since they are also trying to learn a new language at the same time as learning the number words.

Teaching the vocabulary of the number words at the same time we are working on the teen numbers is ideal

so they can relate to what the number words mean. We will continue to use tens frames since students should be comfortable with them by this stage. They will be breaking numbers like twelve into one ten and two ones or 10 and 2.

12 = _____ tens and _____ ones or 12 = _____ and _____



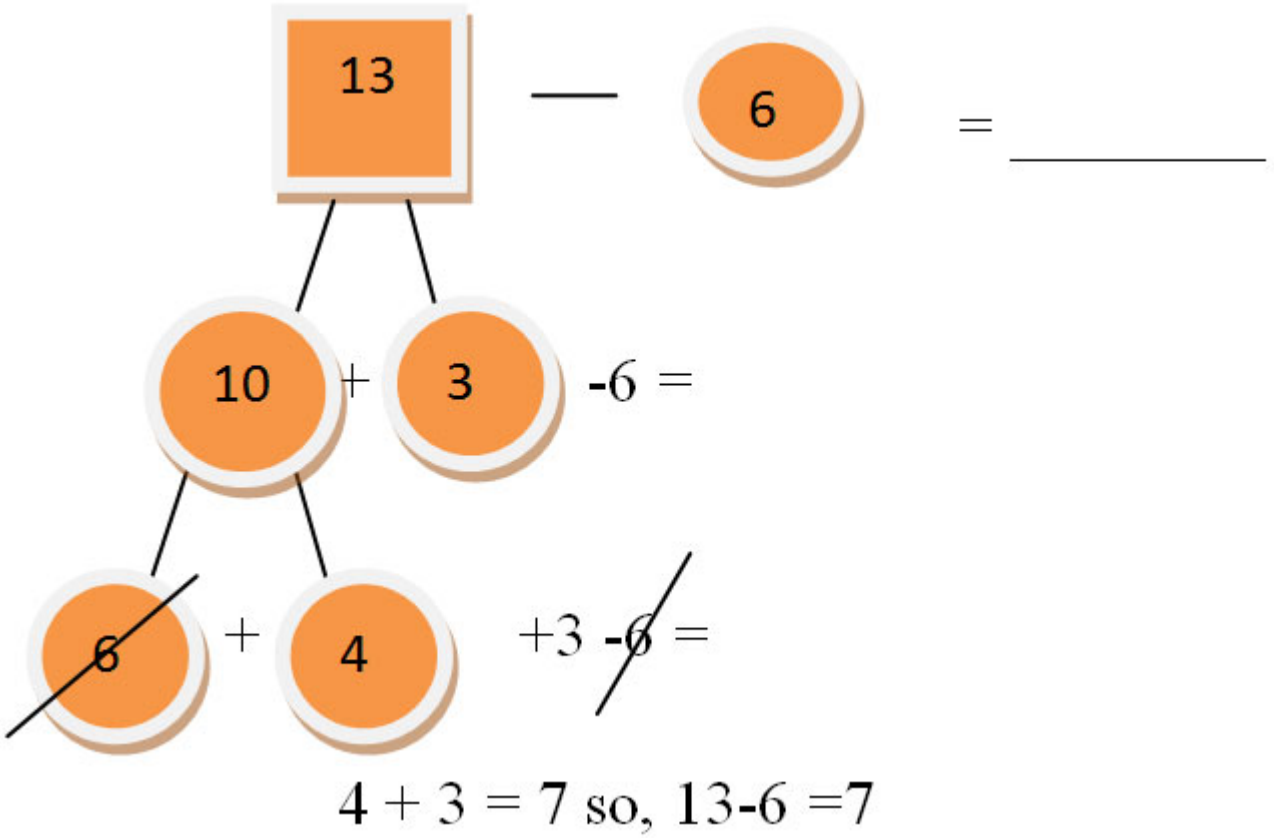


This will also include discussing decomposing of numbers. We will discuss different ways to break the ten apart and different ways to break the two apart. The more discussions around how numbers are composed and decomposed at the early stages of mathematics, the easier it will be for students to add and subtract the bigger numbers.

Students will not only be taking the numbers apart (decomposing), but time needs to be spent on putting them together(composing) also. For instance, they need to know that seventeen is one ten and seven ones but they also need to be fluent with one ten and seven ones is seventeen.

Adding and Subtracting Numbers within 20

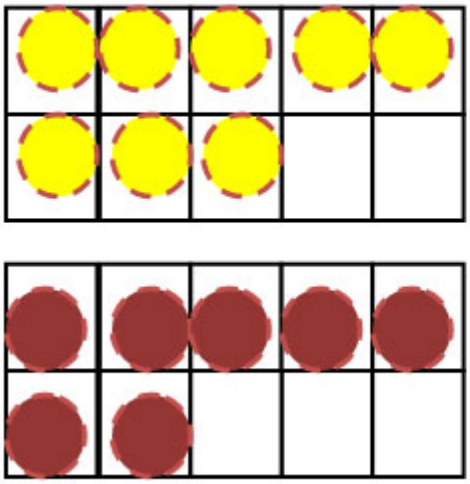
Students need to have mastered decomposing numbers and breaking numbers into tens and ones for them to be ready to add and subtract numbers within 20. This is where students must understand how numbers are put together and taken apart, and not just memorizing becomes very important. The key to adding and subtracting within twenty is making groups of ten, so that the adding and subtracting is easier to manage. In subtracting six from thirteen, they need to be able to think that ten and three is thirteen. Now I need six from the ten so I can cancel out the minus six. I need to break the ten into four and six, now the sixes will cancel out. Now, we have four and three left. Since four and three is seven I know that thirteen minus six is seven.



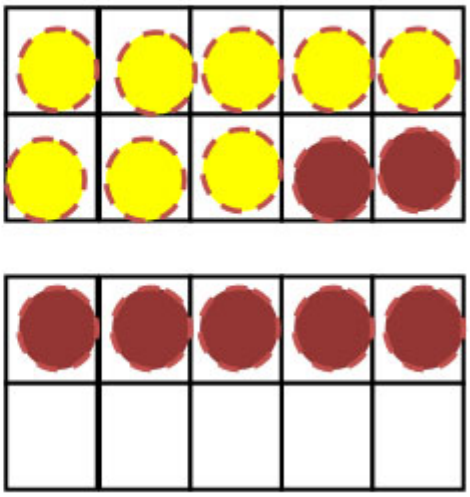
I will address adding and subtracting numbers separately on paper but they will be taught together, just like the lower numbers. It is important that students can relate to the inverse operations and the commutative property (if you know that four plus three is seven, then you know that three plus four is also seven) for them to be successful in adding and subtracting with larger numbers.

In adding eight and seven students must be able to think: What do I need to go with eight to make ten, I need two to go with eight. Now what is left when I break the seven apart? Two and Five. Therefore I have a group of ten and five left over so I have fifteen. I now know that eight and seven is fifteen. I also know that seven and eight is fifteen, and I know my inverse operations: I know that fifteen minus eight is seven and fifteen minus seven is eight.

$8 + 7 =$

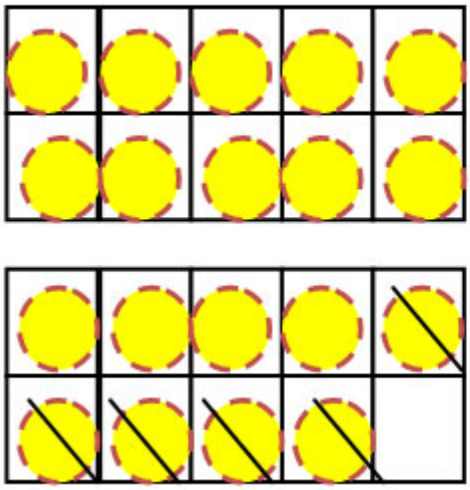


$8 + 2 + 5 = 10 + 5 = 15$

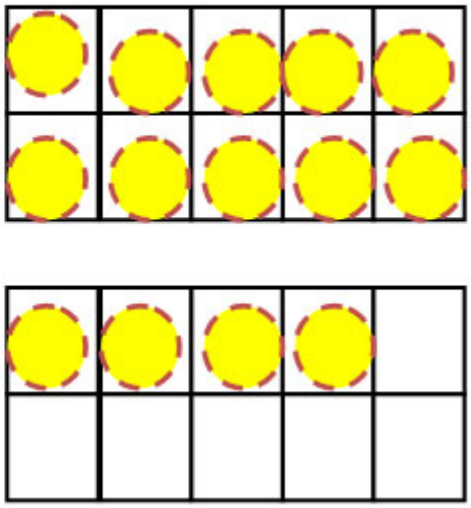


In subtracting five from nineteen students need to break the nineteen into tens and ones, so nineteen is one ten and nine ones. Nine minus five is four, and ten plus four is fourteen. Therefore, five minus nineteen is fourteen. So I know if nineteen minus five is fourteen, I also know that nineteen minus fourteen is five, and five plus fourteen is nineteen, and fourteen plus five is nineteen.

$19 - 5 = 10 + 9 - 5 =$



$10 + 4 = 14$



During the adding and subtracting of numbers the tens blocks will still be used for the visual representation and in addition this would be a good time to introduce using the one hundreds chart for mathematics. Once they are comfortable with the tens blocks, I will introduce tens rods and cubes to make trains for addition and subtraction.

My students will also learn the beginning ideas of place value: that a two-digit number has a group of tens and a group of ones. They will learn to break a two-digit number into tens and ones , and understand what ten of something means (eight groups of ten is eighty). They will also learn how to put a double digit number back together when starting with tens and ones. (nine tens and six ones is ninety-six). They will learn to add or

subtract ten from any double digit number and not just multiples of ten. (twenty-two plus ten is thirty-two).

My students will also learn the beginnings of base ten arithmetic. They will learn the addition and subtraction facts, connecting them to the beginnings of place value via the approach of addition and subtraction within 20. They will also learn that a two-digit number is made up of some tens and some ones, and some ways this is related to addition and subtraction.

In addition to linear problems, story problems will be used in the section to get them used to seeing them but they will not need to know the names of the types of story problems.

Supporting Tools and Activities

Vocabulary

Dolch words are a list of the most used sight words in the English language used in children's literature. This list was compiled by Edward William Dolch, PhD in 19483. Dolch or sight words need to be memorized and most cannot be sounded out because they do not follow the English language rules in phonics. In my classroom, I have seen higher reading and comprehension scores by students who know their sight words.

Students will be taught certain vocabulary words that will help them be successful in reading the problems. Most of the words are on the list of Dolch Words4 that they already are expected to learn. According to Katharine Sullivan5, not teaching them only to read the words but also the meaning of the words will tremendously improve their comprehension of math story problems. There is a short list of 48 words that have been identified to represent fifty one percent of the words in story problems.[1] They need to be taught in context and not in isolation.

the	is	a	are
can	on	page	who
find	one	one	ten
tens	hundred	hundreds	and
or	number	numeral	how
many	what	you	your
we	it	look	write
each	numbers	this	that
set	us	there	which
do	same	exercise	how many
these	first	have	here
times	has	all	equals

In past years, I have had my students work on the Dolch Word list, but this year I will be more focused on what words we will be working on and pick these forty- eight words to work on first. For instance, when writing my math questions I will find five or six of the ones from above and not only use them in my math problems but also use them during the reading and centers time for literacy. The more students come into contact with the words, the more familiar they will be and the faster they will internalize them.

One Hundreds Chart

A hundreds chart is made up of squares put together in rows of ten. Hundreds charts is a visual representation of groups of tens. This helps students see that if the take ten away the number is right above the number they are working on and if they add ten, the number is right below the number they are working on. The tens digit changes by one, and the ones digit does not change.

Modeling

Modeling is something we will especially be using during compare problems. Students will draw out the problem with pictures in a line formation. This will help teach one to one correspondence and get them ready for bar graphs in the second grade.

Bar Graph

We will being using an online bar graph6 for some problems but it will only be used so students have a visual representation of what the question is asking them to do. For instance if the story problem said " There were four apples and five bananas in the basket. How many fruit were in the basket? They put the 4 apples in a bar, then put 5 bananas in a bar. They can see that the total is what is missing so the problem is asking us to add the fruit together. The total will always go on the top of the bar graph. I will be using an online program to make sure that the lengths accurately match the numbers being used and this will only be used for the visual representation of the problems.

How many Fruit?

Fourteen types of Story Problems

Story problems will be taught throughout this unit in all sections but this is the section that they will learn about the each type and how it relates to other types of problems (inverse operations) but will not be learning the names of each type of problem.

The taxonomy of the Common Core[1] distinguishes three main types of problem: change problems, which involve a quantity changing over time; comparison problems, in which one quantity is described as being larger or smaller, greater or less, than another quantity; and part-part-whole problems, in which a large collection is made up of two sub-collections. There are six types of change problems, (three involving increase of a quantity, and three involving decrease), six types of compare problems, and two types of part, part, whole problems. This is just the one step problems! These problems will not be taught in isolation but instead be taught with attention to inverse operations and to the commutative property just as in the other sections. Students need to be able to make connections with these problems to truly internalize what they are learning. It is also important to keep the story scenario the same so that students can concentrate on the numbers and

not the reading. This means that when we are doing apple problems, all of the problems will have the same colors of apples and not suddenly change to truck problems (for example).

I will teach all of the change problems together. We will have lots of discussions on what the story is asking us, is there an action happening in the story, who is the action happening to, what type of problem it is, how do we know what type it is, and how can we restate the problem to make it an inverse operation.

I will have a chart to which we will add each type of problem to as we learn them so we can refer back to it when we are not sure what our problem is asking us. (Is it asking us to add or subtract?) Students will also have this information in the math notebook.

Change plus/final unknown is an addition problem with the total unknown.

Example: There were three apples in the basket at breakfast and Sam added seven apples to the basket at lunch. How many apples are in the basket?

Change plus / change unknown just means it is an addition problem and what is being added is unknown.

Example: There were three apples in the basket at breakfast, Sam added more apples at lunch. Now there are ten apples in the basket. How many apples did Sam put in the basket?

Change plus/ Initial unknown just means it is an addition problem because something is being added together but the first number is unknown. This is the hardest type of change plus problem, therefore, it will be taught last.

Example: Some apples were in the basket at breakfast. Sam put seven apples in the basket at lunch, now there are ten apples in the basket. How many apples were in the basket at breakfast?

Change minus/ final unknown is a subtraction problem with the difference unknown. Example: There were ten apples in the basket before lunch and four apples were eaten at lunch. How many apples are still in the basket?

Change minus/ change unknown is a subtraction problem where what is being subtracted is unknown.

Example: There were eight apples in the basket at breakfast and some were eaten at lunch, now there are three apples in the basket. How many apples were eaten at lunch?

Change minus/ Initial unknown just means it is a subtraction problem since something is being removed but we do not know the initial number.

Example: There were some apples in the basket before breakfast and four apples were eaten during breakfast. Now there are six apples in the basket. How many apples were in the basket before breakfast?

Part, part, whole/ whole unknown is an addition problem that is adding similar items (red and yellow apples or blue and green cars) with the total unknown.

Example: There are seven apples and two oranges in the basket. How many pieces of fruit are in the basket?

Part, part, whole/ part unknown could be an addition or subtraction problem depending on how you set the problem up.

Example: There were nine pieces of fruit in a basket on the table. The basket had four apples and the rest were oranges. How many oranges were in the basket? I would set this problem up as a subtraction problem.

Compare greater / smaller unknown is a problem that compares quantities of two things and someone has more of a quantity than someone else, and the smaller quantity is unknown.

Example: Tim has two more apples than Joe. If Tim has six apples, how many apples does Joe have?

Compare less/ smaller unknown is a problem that compares quantities of two things and someone has less of a quantity than someone else, with the smaller number unknown.

Example: Tim has six fewer apples than Joe. If Joe has nine apples, how many apples does Tim have?

Compare greater / greater unknown is a problem that compares quantities of two things and someone has more of a quantity than someone else, and the larger number is unknown.

Example: Tim has six more apples than Joe. Joe has two apples. How many apples does Tim have?

Compare less / greater unknown is a problem that compares quantities of two things and someone has less of a quantity than someone else, and the larger number is unknown. Example: Tim has one less apple than Joe. If Tim has seven apples, how many apples does Joe have?

Compare greater / difference unknown is a problem that compares quantities of two objects and one of the amounts is larger than the other one, and difference in the amounts is unknown.

Example: Tim has six apples and Joe has four apples. How many more apples does Tim have than Joe?

Compare less / difference unknown is a problem that compares two quantities and one of the amounts is smaller than the other one but the difference in the amounts is unknown.

Example: Tim has six apples and Joe has four apples. How many fewer apples does Joe have than Tim?

Problem Solving Strategy

I plan to help my students become better problem solvers by using the strategy in *How to Solve It* by George Polya7. Polya describes four steps to problem solving. Step one: Understanding the problem. Students in the lower grades need to read a problem two or three times before they comprehend what the problem is asking them. Step two: Devise a plan to solve the problem. This is where we would discuss what kind of problem it is and if we are going to need to add or subtract. I will use turn and talk so students have a chance to discuss with their peer why they believe it is a certain type of problem and how they would solve it. Step three: Implement the plan. Students will use their plan of how to solve their problem and come up with a solution. We would then share our solutions and if some students have a different solution they can explain their reasoning to their solutions. Step four: Reflecting on the problem. Students will reread the problem and put their solutions into the problem and check to see if their solution is correct. We will spend time reflecting on the problems and discussing what they are asking. Reflecting on the problem involves more than checking the correctness of the solution. Reflection is the time when you can ask, is this problem similar to other problems

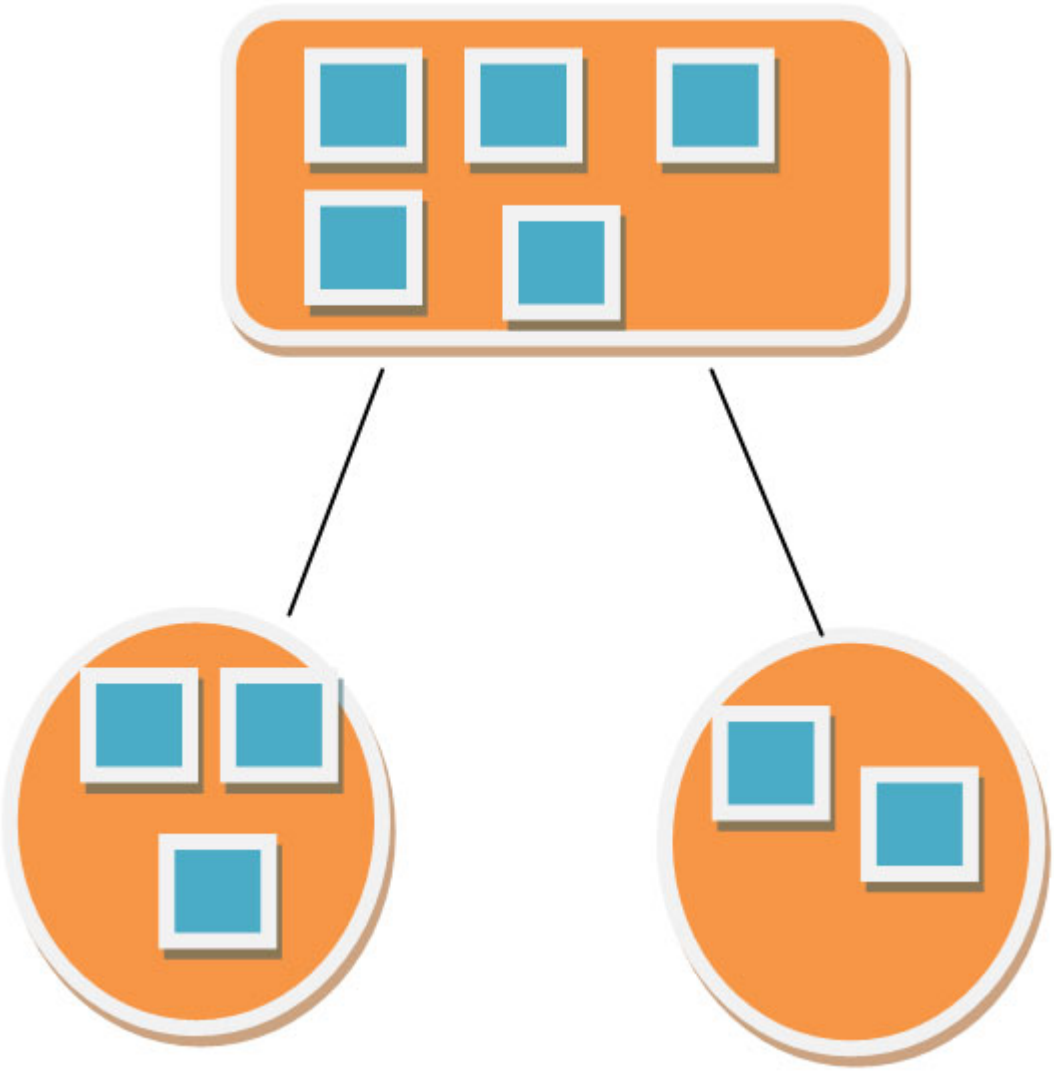
we have solved? Is it different from others. Which other problems are similar, and which are different. What are the differences?

I will have my students will keep a story problem notebook that will be used every day and they will write out these steps in the notebook and draw out their story problems. Once the problem is worked out and checked they will also label the type of problem it is. This will be a reference they can look back on when they have questions about a new problem.

Activities

Activity One

Students will make a number bonds activity mat by using a square piece of construction paper, two round pieces of construction paper, and two rectangular pieces of construction paper. This will be large enough to put unfix cubes on to compose and decompose numbers. After students master them with cubes we will start using numbers.



Activity Two

Students will make an interactive notebook with their daily story problems. I will type the story problem out and they will glue it to one side (the back of a page) of their notebook. The other side will be used for drawing and acting out their math strategy.

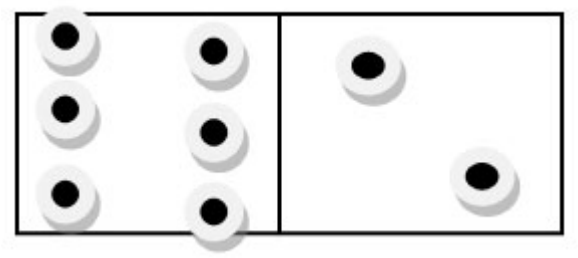
There were two apples in a basket at breakfast.
Tom put three apples in the basket at lunch.
How many apples are in the basket?

Activity Three

Students will use picture books to make their own story problems. Students will pick out a picture book in the library. Each group of students (4 per group) will find a picture and discuss ways to make a story problem. Once they have made a decision on the story problem they will write it on a piece of construction paper and illustrate the picture. Students will work together until they have made a story problem for each of the students books. We will share their stories and display them in our room.

Activity Four

Students will make story problems with dominoes by using inverse operations. If their domino has a six and a two on it, they will write an equation for each family addition and subtraction problem.



6 + 2 = 8

2 + 6 = 8

8 - 2 = 6

8 - 6 = 2

Once the equations are correct the students will write a story problem for their equations and illustrate their stories on construction paper. Students will share and display their stories in the classroom or hallway. This activity helps students learn the inverse operations of numbers.

Activity Five

Students will do addition and subtraction on mats with straight pretzels and marshmallows. The pretzels will represent the tens rods and the marshmallows will represent the ones cubes. This activity helps students

learn to add tens together and ones together. If they have a problem like twenty six plus thirteen, they will put two pretzel sticks in the tens place and six marshmallows in the ones place. Under those they will put one pretzel stick under the tens place and three marshmallows in the ones place. Now they can add the two tens and the one tens to get three tens or thirty. Then they will add the six ones and the three ones to get nine ones. This activity helps students learn to line up their tens and ones.

Appendix

There were some cookies in the cookie jar on Monday. Mom put seven cookies in the cookie jar on Tuesday. Now there are ten cookies in the cookie jar. How many cookies were in the cookie jar on Monday? (Change plus/ Initial Unknown)

There were some cookies in the cookie jar on Monday. Seven cookies were eaten on Tuesday, now there are two cookies in the cookie jar. How many cookies were in the jar on Monday? (Change minus/Initial Unknown)

There were eight cookies in the cookie jar in the morning. At lunch mom put some cookies in the cookie jar, now there are twelve cookies in the cookie jar. How many cookies did mom put in the cookie jar? (Change plus/ change unknown)

There were eighteen cookies in the cookie jar before lunch and some were eaten at lunch. There are now ten cookies in the cookie jar. How many cookies were eaten at lunch? (Change minus/change unknown)

There were six cookies in the cookie jar a lunch. Mom put ten cookies in the cookie jar at dinner. How many cookies are in the cookie jar? (Change plus/Final Unknown)

There were ten cookies in the cookie jar before lunch. Four cookies were eaten at lunch. How many cookies are in the cookie jar? (Change minus/ Final Unknown)

There were nine chocolate chip cookies and eight oatmeal cookies in the cookie jar. How many cookies are in the cookie jar? (Part, Part, Whole/Whole Unknown)

There were eight-teen cookies in the cookie jar, some are chocolate chip and some are oatmeal. If nine cookies are oatmeal, how many cookies are chocolate chip? (Part, Part, Whole/Part Unknown)

Lori has six more cookies than Sara. If Lori has eleven cookies, how many cookies does Sara have? (Compare greater / smaller unknown)

Lori has nine fewer cookies than Sara. If Sara has twelve cookies, how many cookies does Lori have? (Compare less/ smaller unknown)

Lori has seven more cookies than Sara. If Sara has five cookies, how many cookies does Lori have? (Compare greater / greater unknown)

Lori has three fewer cookies than Sara. If Lori has twelve cookies, how many cookies does Sara have? (Compare less / Greater Unknown)

Lori has fourteen cookies and Sara has six cookies. How many more cookies does Lori have than Sara? (Compare greater/ difference unknown)

Lori has nine cookies and Sara has two cookies. How many fewer cookies does Sara have than Lori? (Compare less/ difference unknown)

Notes

1. http://www.corestandards.org/Math/Content/mathematics-glossary/Table-1/
2. http://www.corestandards.org/Math/
3. http://www.mrsperkins.com/what_are_dolch_words.html
4. http://www.mrsperkins.com/dolch.htm
5. Sullivan, Kathern, " Do the Little Words Count?", *American ReadingForum 1982*, www.americanreadingforum.org, assessed July 13,2015
6. http://www.mathplayground.com/tb_addition/thinking_blocks_addition_subtraction.html
7. Polya, George, 2014. *Princeton Law Library*

Bibliography for Teachers

Forsten, Char. *Step by Step Model Drawing: Solving Word Problems the Singapore Way.* Crystal Springs Books, 2010. Describes the eight steps in teaching students how to model their problems for clear understanding.

Howe, Roger. " From Arithmetic to Algebra, Problem Soving and the Common Core." *Yale National Initiative.* May 8, 2015. https://classesv2.yale.edu/portal/site/4b1f0e04-2f69-4d2c-b3ab-862bd5b3ab50 (accessed May 10, 2015). Describes teaching techniques used in elementary that helps students understand problem solving in Algebra.

Howe, Roger. "Problem Solving and the Common Core." *Yale National Initiative .* May 8, 2015. https://classesv2.yale.edu/portal/site/4b1f0e04-2f69-4d2c-b3ab-862bd5b3ab50 (accessed May 10, 2015).

Howe, Roger. "Three Pillars of First Grade Mathematics, and Beyond." *Problem Solving and the Common Core, Yale National Initiative 2015.* May 8, 2015. https://classesv2.yale.edu/portal/site/4b1f0e04-2f69-4d2c-b3ab-862bd5b3ab50 (accessed May 10, 2015). A great resourse that describes the learning process students need to become better problem solvers.

Initiative, State Standards. *Common Core Standards.* http://www.corestandards.org/Math/Content/1/introduction/ (accessed May 14, 2015). List all of the Common Core Standards for each grade level.

NY Engage Mathematics. 2015. https://www.engageny.org/resource/grade-1-mathematics (accessed June 12, 2015). A common core math curriculum that is currently used my by district.

Polya, George. *How To Solve It.* Princeton: Princeton University Press, 1973. A book about the four steps of problem solving.

Prekins, Mrs. *Mrs. Perkins Dolch Words.* 2003. http://www.mrsperkins.com/dolch.htm (accessed September 1, 2014). A resourse that

explains about the Dolch words, list all the dolch word list by grade, and has many resources for teaching the sight words.

Sinagapore Math Inc. *Primary Mathematics Workbook 1A Common Core Edition.* Singapore: Marshall Cavendish Education, 2014.

Singapore Math Inc. *Primary Mathematics Extra Practice 1 Common Core Edition.* Singapore: Marshall Cavendish, 2014.

Singapore Math Inc. *Primary Mathematics Workbook 1B Common Core Edition.* Singapore: Marshall Cavendish Education, 2014.

Singapore Math Inc. *Primary Mathematics Textbook 1B Common Core Edition.* Singapore: Marshall Cavendish Education, 2014.

Singapore Math. *Primary Mathematics Textbook 1A Common Core Edition.* Singapore: Marshall Cavendish Education, 2014.