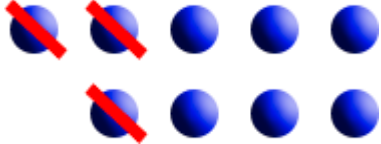


Seymour Public Schools Math Grade 1 Unit 3

<p>Grade: 1</p> <p>Unit 3- Solving equations with Unknown Numbers</p>	<p>Subject: Math</p> <ul style="list-style-type: none"> • Time Frame: 22 days • Domain: Operations and Algebraic Thinking 	
<p>Standards</p>	<p>Content Standards: 1.OA.1, 1.OA.3, 1.OA.4, 1.OA.5, 1.OA.6, 1.O.A.7, 1.OA.8 http://www.corestandards.org/wp-content/uploads/Math_Standards.pdf</p>	<p>Practice Standards: MP 1, 2, 3, 4, 5, 6, 7, 8</p>
<p>Enduring Understandings</p>	<ol style="list-style-type: none"> 1. Model the situation by composing two addend groups or decomposing a total group. 2. Model an addition or subtraction involving an unknown addend. 3. Use circle drawings, Math Mountains, and equations to represent an unknown addend problem. 4. Work toward fluency for addition and subtraction within 10. 	
<p>Essential Questions</p>	<ol style="list-style-type: none"> 1. What strategies would you use to solve addition equations? 2. What strategies would you use to solve subtraction equations? 3. How do we use addition to solve story problems and visualize equality? 4. How do we use subtraction to solve story problems and visualize equality? 5. How can we solve equations with unknown partners? 	
<p>Vocabulary</p>	<p>unknown partner, story problem, label, difference, subtraction story problem</p>	

Priority and Supporting CCSS	Explanations and Examples*
<p>1. OA.1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.</p>	<p>1. OA.1. Contextual problems that are closely connected to students' lives should be used to develop fluency with addition and subtraction. Table 1 (Appendix A) describes the four different addition and subtraction situations and their relationship to the position of the unknown. Students use objects or drawings to represent the different situations.</p> <ul style="list-style-type: none"> • <i>Take-from</i> example: Abel has 9 balls. He gave 3 to Susan. How many balls does Abel have now?  <ul style="list-style-type: none"> • <i>Compare</i> example: Abel has 9 balls. Susan has 3 balls. How many more balls does Abel have than Susan? A student will use 9 objects to represent Abel's 9 balls and 3 objects to represent Susan's 3 balls. Then they will compare the 2 sets of objects. <p>Note that even though the modeling of the two problems above is different, the equation, $9 - 3 = \underline{\quad}$, can represent both situations yet the compare example can also be represented by $3 + \underline{\quad} = 9$ (How many more do I need to make 9?)</p> <p>It is important to attend to the difficulty level of the problem situations in relation to the position of the unknown.</p> <ul style="list-style-type: none"> • <i>Result Unknown</i> problems are the least complex for students followed by <i>Total Unknown</i> and <i>Difference Unknown</i> • The next level of difficulty includes <i>Change Unknown</i>, <i>Addend Unknown</i>, followed by <i>Bigger Unknown</i> • The most difficult are <i>Start Unknown</i>, <i>Both Addends Unknown</i>,

*Source – Connecticut Core Standards for Mathematics as adapted from the Arizona Academic Content Standards

Priority and Supporting CCSS	Explanations and Examples*
	<p style="text-align: center;"><i>and Smaller Unknown</i></p> <p>Students may use document cameras to display their combining or separating strategies. This gives them the opportunity to communicate and justify their thinking.</p>

Priority and Supporting CCSS	Explanations and Examples*
<p>1. OA.5. Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).</p> <p>1. OA.6. Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).</p> <p>1. OA.7. Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$.</p>	<p>1. OA. 5. Students’ multiple experiences with counting may hinder their understanding of counting on and counting back as connected to addition and subtraction. To help them make these connections when students count on 3 from 4, they should write this as $4 + 3 = 7$. When students count back (3) from 7, they should connect this to $7 - 3 = 4$. Students often have difficulty knowing where to begin their count when counting backward.</p> <p>1. OA. 6. This standard is strongly connected to all the standards in this domain. It focuses on students being able to fluently add and subtract numbers to 10 and having experiences adding and subtracting within 20. By studying patterns and relationships in addition facts and relating addition and subtraction, students build a foundation for fluency with addition and subtraction facts. Adding and subtracting fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently. The use of objects, diagrams, or interactive whiteboards and various strategies will help students develop fluency.</p> <p>1.OA.7. Interchanging the language of “equal to” and “the same as” as well as “not equal to” and “not the same as” will help students grasp the meaning of the equal sign. Students should understand that “equality” means “the same quantity as”.</p> <p>In order for students to avoid the common pitfall that the equal sign means “to do something” or that the equal sign means “the answer is,” they need to be able to:</p> <ul style="list-style-type: none"> • Express their understanding of the meaning of the equal sign • Accept sentences other than $a + b = c$ as true ($a = a$, $c = a + b$, $a = a + 0$,

$$a + b = b + a)$$

- Know that the equal sign represents a relationship between two equal quantities
- Compare expressions without calculating

These key skills are hierarchical in nature and need to be developed over time. Experiences determining if equations are true or false help students develop these skills. Initially, students develop an understanding of the meaning of equality using models. However, the goal is for students to reason at a more abstract level. At all times students should justify their answers, make conjectures (e.g., if you add a number and then subtract that same number, you always get zero), and make estimates.

Once students have a solid foundation of the key skills listed above, they can begin to rewrite true/false statements using the symbols, $<$ and $>$.

Examples of true and false statements:

- $7 = 8 - 1$
- $8 = 8$
- $1 + 1 + 3 = 7$
- $4 + 3 = 3 + 4$
- $6 - 1 = 1 - 6$
- $12 + 2 - 2 = 12$
- $9 + 3 = 10$
- $5 + 3 = 10 - 2$
- $3 + 4 + 5 = 3 + 5 + 4$
- $3 + 4 + 5 = 7 + 5$
- $13 = 10 + 4$
- $10 + 9 + 1 = 19$

Students can use a clicker (electronic response system) or interactive whiteboard to display their responses to the equations. This gives them the

	opportunity to communicate and justify their thinking.
--	--

Priority and Supporting CCSS	Explanations and Examples*
<p>1. OA.8. Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. <i>For example, determine the unknown number that makes the equation true in each of the equations $8 + \underline{\quad} = 11$, $5 = \underline{\quad} - 3$, $6 + 6 = \underline{\quad}$</i></p>	<p>1. OA. 8. Students need to understand the meaning of the equal sign and know that the quantity on one side of the equal sign must be the same quantity on the other side of the equal sign. They should be exposed to problems with the unknown in different positions. Having students create word problems for given equations will help them make sense of the equation and develop strategic thinking.</p> <p>Examples of possible student “think-throughs”:</p> <ul style="list-style-type: none"> • $8 + \underline{\quad} = 11$: “8 and some number is the same as 11. 8 and 2 is 10 and 1 more makes 11. So the answer is 3.” • $5 = \underline{\quad} - 3$: “This equation means I had some cookies and I ate 3 of them. Now I have 5. How many cookies did I have to start with? Since I have 5 left and I ate 3, I know I started with 8 because I count on from 5 . . . 6, 7, 8.” <p>Students may use a document camera or interactive whiteboard to display their combining or separating strategies for solving the equations. This gives them the opportunity to communicate and justify their thinking.</p>

Seymour Public Schools Math Grade 1 Unit 3

Resources

Math Expressions - Unit 3, Lessons 1-12
Soar to Success Math Intervention
Mega Math
Destination Math
Common Core Mathematics-Newmark Learning- Units-1, 2, 3, 5, 6, 7, 8

Unit Assessments

Unit Test
Quick Quizzes
Formative Assessments
Performance Assessment

Technology: Videos, Websites, Links

www.learnzillion.com

www.xtramath.org

<https://www.georgiastandards.org/Common-Core/Pages/Math-K-5.aspx>

<http://exchange.smarttech.com/index.html#tab=0>

<http://nlvm.usu.edu/en/nav/vlibrary.html>

http://www.mathplayground.com/common_core_state_standards_for_mathematics.html

<https://grade1commoncoremath.wikispaces.hcpss.org/1.OA.1>

<https://grade1commoncoremath.wikispaces.hcpss.org/1.OA.3>

http://www.internet4classrooms.com/common_core/apply_properties_operations_strategies_add_subtract_operations_algebraic_thinking_first_1st_grade_math_mathematics.htm

http://mrnussbaum.com/grade_1_standards/

<http://www.youtube.com/watch?v=OWpTqaSr7e8>

http://ccssmath.org/?page_id=49

<http://www.ohiorc.org/standards/commoncore/mathematics/grade.aspx?id=5022>

<https://sites.google.com/a/bryantschools.org/math-common-core-resource-site/home-1/1st-grade/1-0a-6>

<http://www.mrmaffesoli.com/1stGrade/1stGradeCCS.html>

APPENDIX A—TABLE 1

TABLE 1. Common addition and subtraction situations.⁶

	Result Unknown	Change Unknown	Start Unknown
Add to	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? $2 + 3 = ?$	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two? $2 + ? = 5$	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before? $? + 3 = 5$
Take from	Five apples were on the table. I ate two apples. How many apples are on the table now? $5 - 2 = ?$	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat? $5 - ? = 3$	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before? $? - 2 = 3$
	Total Unknown	Addend Unknown	Both Addends Unknown ¹
Put Together/ Take Apart²	Three red apples and two green apples are on the table. How many apples are on the table? $3 + 2 = ?$	Five apples are on the table. Three are red and the rest are green. How many apples are green? $3 + ? = 5, 5 - 3 = ?$	Grandma has five flowers. How many can she put in her red vase and how many in her blue vase? $5 = 0 + 5, 5 = 5 + 0$ $5 = 1 + 4, 5 = 4 + 1$ $5 = 2 + 3, 5 = 3 + 2$
	Difference Unknown	Bigger Unknown	Smaller Unknown
Compare³	(“How many more?” version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy? (“How many fewer?” version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie? $2 + ? = 5, 5 - 2 = ?$	(Version with “more”): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? (Version with “fewer”): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? $2 + 3 = ?, 3 + 2 = ?$	(Version with “more”): Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have? (Version with “fewer”): Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have? $5 - 3 = ?, ? + 3 = 5$

¹These take apart situations can be used to show all the decompositions of a given number. The associated equations, which have the total on the left of the equal sign, help children understand that the = sign does not always mean makes or results in but always does mean is the same number as.

²Either addend can be unknown, so there are three variations of these problem situations. Both Addends Unknown is a productive extension of this basic situation, especially for small numbers less than or equal to 10.

³For the Bigger Unknown or Smaller Unknown situations, one version directs the correct operation (the version using more for the bigger unknown and using less for the smaller unknown). The other versions are more difficult.