



# Grade 3 - Unit 1 - Addition and Subtraction Patterns within 1,000

## Unit Focus

This unit begins reviewing patterns in addition and subtraction facts to 20, the pattern of adding 10s, and problem solving which were taught in grade 2. The concept of rounding to the nearest ten and/or hundred is introduced which is then used as a strategy to estimate and partition three-digit numbers in order to add and subtract efficiently. Later in the unit, the students apply the addition and subtraction strategies they have learned to add and subtract multi-digit numbers efficiently on the open number line. They practice place value splitting with addition. Students are introduced to adding and subtracting numbers using expanded notation as well as the standard algorithm for each. Students gain experiences and strategies for making sense of problems and communicating effectively about the accuracy and efficiency of various solutions. In this unit, expectations for working cooperatively on learning tasks are established.

## Stage 1: Desired Results - Key Understandings

Standard(s)	Transfer	
<b>Standards</b> <ul style="list-style-type: none"><li>Common Core<ul style="list-style-type: none"><li><i>Mathematics: 3</i></li></ul></li><li>Solve problems involving the four operations, and identify and explain patterns in arithmetic.</li><li>Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (CCSS.MATH.CONTENT.3.OA.D.8)</li><li>Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends. (CCSS.MATH.CONTENT.3.OA.D.9)</li><li>Use place value understanding and properties of operations to perform multi-digit arithmetic.</li><li>Use place value understanding to round whole numbers to the nearest 10 or 100. (CCSS.MATH.CONTENT.3.NBT.A.1)</li><li>Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. (CCSS.MATH.CONTENT.3.NBT.A.2)</li><li>Represent and interpret data.</li><li>Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step how many more and how many less problems using information presented in scaled bar graphs. For example,</li></ul>	<i>Students will be able to independently use their learning to...</i> <b>T1</b> Represent situations using mathematical reasoning and symbols. <b>T2</b> Apply an understanding of known patterns to new problems and make connections between concepts.	
	Meaning	
	Understanding(s)	Essential Question(s)
	<i>Students will understand that...</i> <b>U1</b> Mathematicians make sense of quantities to represent situations mathematically. <b>U2</b> Mathematicians attend to the underlying meaning of quantities and symbols. <b>U3</b> Mathematicians use their knowledge from patterns and structures to apply efficient strategies to solve a problem.	<i>Students will keep considering...</i> <b>Q1</b> How can the relationship between quantities be represented? <b>Q2</b> What do the quantities mean? <b>Q3</b> How can a pattern be generalized to a rule? <b>Q4</b> How can we apply knowledge of a pattern to similar problems?
	Acquisition of Knowledge and Skill	
	Knowledge	Skill(s)
<i>Students will know...</i> <b>K1</b> number combinations to 20 fluently <b>K2</b> there are different strategies that allow us to add and subtract flexibly and visually	<i>Students will be skilled at...</i> <b>S1</b> adding and subtracting with sums and minuends to 20 using mental strategies	

## Stage 1: Desired Results - Key Understandings

<p>draw a bar graph in which each square in the bar graph might represent 5 pets. (<i>CCSS.MATH.CONTENT.3.MD.B.3</i>)</p> <ul style="list-style-type: none"> <li>▪ Mathematical Practices</li> <li>▪ Reason abstractly and quantitatively. (<i>CCSS.MATH.MP.2</i>)</li> <li>▪ Look for and express regularity in repeated reasoning. (<i>CCSS.MATH.MP.8</i>)</li> </ul> <p><b>Madison Public Schools Profile of a Graduate</b></p> <p>Analyzing: Examining information/data/evidence from multiple sources to identify possible underlying assumptions, patterns, and relationships in order to make inferences. (<i>POG.1.2</i>)</p>	<p><b>K3</b> patterns exist among addition problems</p> <p><b>K4</b> problems can be approached from a range of perspectives</p> <p><b>K5</b> numbers can be manipulated in a variety of ways</p> <p><b>K6</b> how to use a number line to round numbers to the nearest 10 or 100</p> <p><b>K7</b> mathematical concepts and ideas can be explained using visual models and written explanations</p> <p><b>K8</b> picture graphs and bar graphs represent mathematical data</p> <p><b>K9</b> Vocabulary: difference, sum, commutative property of addition, associative property of addition, friendly number, bar graph, picture graph</p>	<p><b>S2</b> recalling sums of two 1-digit numbers from memory</p> <p><b>S3</b> explaining patterns among basic addition and subtraction facts</p> <p><b>S4</b> using decomposing numbers on a number line, place value splitting, give and take and standard algorithm strategies for addition within 1,000</p> <p><b>S5</b> using decomposing numbers on a number line, place value splitting, constant difference and standard algorithm strategies for subtraction within 1,000</p> <p><b>S6</b> solving one-step addition and subtraction story problems</p> <p><b>S7</b> solving two-step word problems using addition and subtraction</p> <p><b>S8</b> writing equations to represent two-step story problems</p> <p><b>S9</b> rounding whole numbers to the nearest 10 or 100</p> <p><b>S10</b> creating a picture graph or bar graph</p> <p><b>S11</b> answering mathematical questions from data represented on a bar graph or picture graph</p>
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