K-3	
4-5	
6-8	
9-12	

GRADE 2 — *Mathematics 4.1 - Number and Numerical Operations*

A. Number Sense
B. Numerical Operations
C. Estimation

Benchmarks **By the end of Grades 8 at developmentally appropriate levels of increasing complexity and skill, all students should:**	**Grade Specific Concepts/Skills** **By the end of the grade level listed above, to meet Grade 8 benchmarks, a student should be able to do the following using increasingly complex materials linked to increasingly skilled performance:**	**Student Activities/Evidence** **The following are examples of tasks/classroom assessments that provide evidence of a student's progress toward proficiency:**
A. Develop number sense and the ability to represent and use numbers in a variety of formats.	• Use, compare and order whole numbers through hundreds. • Develop and use whole number place value concepts. • Use ordinal numbers and number words to describe situations. • Count and perform simple computations with coins. Amounts up to $1.00 using cents notation. • Develop the concept of fractions (denominators of 2, 3, 4, 8, 10).	• Students play the *Broken Key* game on their calculators. Second graders might try to get the display to show *45* without pressing the *4* or the *5* key. • Students use numbers throughout the school day as they discuss the date, attendance, time, snacks, money, etc. • Calendar activities at the beginning of the school day incorporate a *Daily Count* feature where each day another popsicle stick is added to a collection representing all of the days of school to date. Whenever 10 single sticks are available, they are bundled with a rubber band and are thereafter counted as a *ten*. On the hundredth day of school, the ten *tens* are wrapped together to make a *hundred*, and the class celebrates the event with a party. • Students play *Spend a Dollar*. They each start with $1 (either as a bill or in change) and then roll one or two dice to find out how much they "spend" on that turn. They trade coins as needed. The student who spends all of her money first wins. • Read *Pizza Pizzazz!* By Carol A. Losi (Marilyn Burns Library) to introduce fractions as part of a whole. • Students find half of a sheet of paper by folding horizontally, by folding vertically, and by

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		folding diagonally. They compare the results and discuss how they are alike and how they are different.
B. Understand, select, and apply various methods of performing numerical operations.	• Join, separate and compare numbers. • Develop proficiency with and memorize basic addition and subtraction number facts. • Develop meaning and proficiency in addition and subtraction of 2-digit numbers. • Explore the meanings of multiplication and division.	• Students regularly use the *doubles* and *near doubles*, the *make ten*, and the *counting on* and *counting back* strategies for addition and subtraction. Practice sets of problems are structured so that use of all of these strategies is encouraged and the students are regularly asked to explain the procedures they are using. • Students use popsicle sticks bundled as tens and ones to try to find a solution to the first two-digit addition problem they have formally seen: *Our class has 27 children and Mrs. Johnson's class has 26. How many cupcakes will we need for our joint party?* Solution strategies are shared and discussed with diversity and originality praised. Other problems, some requiring regrouping and others not, are similarly solved using the student-developed strategies. • Students look forward to the hundredth day of school, on which there will be a big celebration. On each day preceding it, the students use a variety of procedures to determine how many days are left before day 100.

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		• Students find the answer to an addition or subtraction problem in as many different ways as they can. For example, they might solve *28 + 35* in the following ways: *8 + 5 = 13 and 20 + 30 = 50, so 13 + 50 = 63* *28 + 30 = 58. Two more is 60, and 3 more is 63* *25 + 35 = 60 and 3 more is 63.* • Read *Too Many Kangaroo Things To Do* by Greg Tang to explore multiplication.
C. Use a variety of estimation strategies and recognize situations in which estimation is appropriate.	• Estimate amounts and verify results of computations. • Solve real-world problems using estimation, addition and subtraction. • Develop and use systematic approaches to problem solving.	• Students play *Guess the Point*. A long number line with endpoints of 20 and 75, for example, is drawn on the board where all of the intermediary points are labeled above the line. The labels are then covered by a long piece of paper that can be lifted to reveal them. A student places a finger somewhere on the line and others must estimate the numerical label of the point chosen. The paper is then lifted to check the accuracy of their responses. • Students use estimation to find out whether a package of 40 balloons is enough for everyone in the class of 26 to have two balloons. They discuss the strategies they use to solve this problem and decide if they should buy more packages.

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		• As an assessment of students' ability to judge without counting, the teacher puts some counters (more than five) on the overhead projector, turns it on for a few seconds, and then asks the students to write whether the number of counters shown is closer to 10 or to 20. • Students are given a set of thirty cards with two-digit addition problems on them. In one minute, they must sort the cards into two piles: those problems whose answers are greater than 100 and those less than 100. The correct answers can be on the backs of the cards to allow self-checking after the task is completed. • Given a pair of real-life situations, students determine which situation in the pair is the one for which estimation is a good approach and which is the one that probably requires an exact answer. One such pair, for example, might be: *sharing a bag of peanuts among 3 friends* and *paying for 3 tickets at the movie theater*.

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RESOURCES

New Jersey Core Curriculum Content Standards - Mathematics
New Jersey Mathematics Curriculum Framework
Principles and Standards for School Mathematics by National Council of Teachers of Mathematics (NCTM)
Houghton Mifflin Math-Grade 2 Copyright 2005
Pizza Pizzazz! By Carol A. Losi
Too Many Kangaroo Things To Do by Greg Tang