

## *Mathematics Lesson Plan (for Grade 2)*

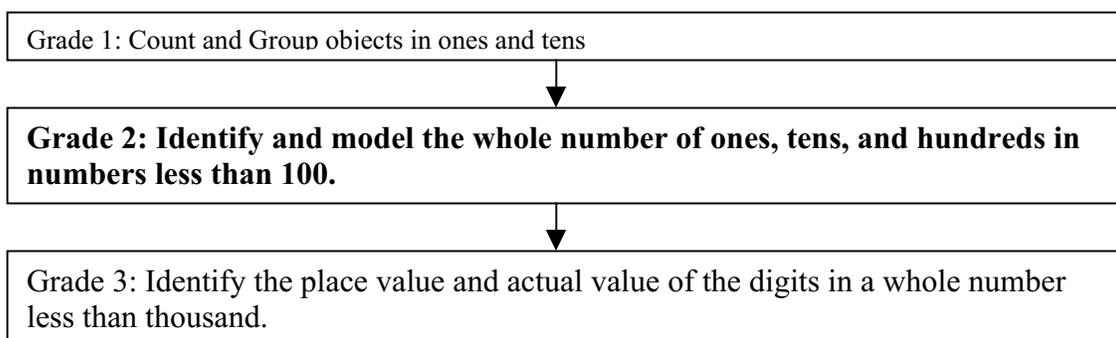
For the lesson on Thursday January, 23, 2003  
At North Marion School District, Portland, OR.  
Instructor: Aki Murata

1. Title of the lesson: Seeing Numbers in Tens and Ones.
2. Goal of the lesson

Students will develop understanding of the structure of 2-digit numbers as tens and ones (place value understanding).

3. Relationship between this lesson and Oregon Content Standards:

Oregon Mathematics Content Standards; Calculations and Estimations, Numbers



4. About the lesson:

This lesson will be taught as a part of “Branching into larger numbers: Money & place value” unit in the *Bridges in Mathematics* curriculum (The Math Learning Center, 1999). The unit is designed to provide students experiences with numbers above ten. Students have so far worked with numbers up to 20, and with this lesson being placed in the earlier part of the unit, it is assumed that they are still developing their ways to see large numbers in chunks of tens and ones.

Thinking about numbers in terms of 10 is important as it is the foundation of our number system (base-ten system). Developing the understanding of the place value system at this early age will help build the foundation for students’ future exploration with multi-digit calculations. *Bridges in Mathematics* curriculum introduces the place value concept with a child-friendly theme of parcels and presents in the initial part of the unit. This lesson is an extension of that theme by using coins (dimes, nickels, and pennies) to structure their thinking in terms of 10s, 5s, and 1s as they add numbers.

The lesson starts with the summary of the game students played earlier, “25 cents or bust!” (session 12 of the unit). The game provides opportunities for students to think about numbers in chunks of 5s and 10s with the values of coins. Two teams of students pull a card from a stack of cards that illustrate various combinations of dimes, nickels, and pennies. Each team is allowed to pull either 3 or 4 cards to get their total as close to 25 cents as possible but not to exceed it. The team whose total is closer to 25 cents wins the game. By sharing their thinking and strategies for the game, students are encouraged to see numbers in terms of 10, by using different representations (coins, base-ten representations, and numbers).

For the last half of the lesson, when students work as a pair/small group to find ways to make exactly 25 (or 50) cents, they are required to think differently from how they did as they played the game earlier. Without the cards that provided students with set values, they are to find the combinations from scratch to make 25 (or 50) cents. Some students may find this easier, while other students may have difficulty getting started with the activity. The use of different representations in the early part of the lesson may also influence their approach to this activity. For this part of the lesson, the target number (25 or 50) will be determined after my assessing student engagement and performance for the “25 cents or bust!” game. This will be decided in the actual lesson.

By synthesizing their ideas at the end of the lesson while comparing the strategies students used for the “25 cents or bust!” game and also the making-25 (or 50) activity, the reason for using 10 will be emphasized in the discussion. Along with other classroom and out-of-classroom experiences students have with large numbers, this lesson will help them develop their understanding of the place value system.

#### 5. Lesson Procedures:

<u>Activities, Teachers Questions, Anticipated Student Responses</u>	<u>Teacher Support</u>	<u>Evaluation</u>
<p>1. <b>Introduction to the Lesson:</b> Review of the results of the game (25 cents or Bust!) played in the morning will lead the students to discuss the methods they used (add the values of coins to get as close to 25 cents as possible) as they played the game.</p> <div data-bbox="207 1451 1092 1514" style="border: 1px solid black; padding: 5px; text-align: center;"> <p><i>How did we know when we were close to 25 cents?</i></p> </div> <p>(5 minutes)</p>		<p>Are students interested in the problem?</p>
<p>2. <b>Sharing of student ideas (1):</b> Using the actual game sheet used (with pictures of coins), students will describe their thinking as they played the game in the morning (2 examples?).</p> <div data-bbox="191 1686 812 1892" style="border: 1px solid black; padding: 5px;"> <p><i>Anticipated students’ responses:</i></p> <ol style="list-style-type: none"> <li>1. Adding numbers by counting on in order.</li> <li>2. Grouping all the 10s together first and counting on the rest.</li> <li>3. Grouping all the 10s together and grouping the rest to make 10.</li> </ol> </div>	<p>Using the game sheet (with pictures of coins), base-ten pieces (similar to ‘presents and parcels’ pieces students have been using in the classroom), and numbers, support sharing of students’ ideas.</p>	<p>Are all students engaged?</p>

<p><b><i>It seems that some (many) of you made 10 as you thought about this. I wonder why you did that ... Let's continue thinking about 10 as we work on the next activity.</i></b></p>		
(15 minutes)		
3. <b>Introduction to the next activity:</b> As a pair (small group), students will find ways to make 25 (or 50) cents. (5 minutes)	Briefly explain the activity and distribute papers.	Do students understand what to do?
4. <b>Pair/Small group problem solving:</b>  <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p><b><i>Anticipated students' responses:</i></b></p> <ol style="list-style-type: none"> <li>1. Start from 25 (50), subtract the values of coins one by one (or as groups of 10 and ones).</li> <li>2. Start from 0, add the values of coins one by one (or as groups of 10 and ones).</li> <li>3. Line up coins randomly and see how close the total is to 25 (50).</li> </ol> </div>	If a pair/group finds a solution right away, encourage them to find another way to solve it.  Teachers go around the classroom and choose students work for the discussion that follows (need good variety of different combinations).	Does every pair (group) find a solution to the problem?  What do students use to guide their thinking (fingers, drawing, etc.)?
(10 minutes)		
5. <b>Sharing of student ideas (2):</b> Students share their solutions. Being guided by teacher questions, students describe their thinking as they found the solutions. (15 minutes)	Teacher may need to suggest students to use different representations as they describe their thinking.	Are students attentive to others' explanations? Use of different representations?
6. <b>Synthesis of student ideas and summary:</b>  <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p><b><i>It seems that we used 10s both for the game this morning and also for making 25 cents now. Why do you think we did that? Why do we use chunks of 10?</i></b></p> </div>		Do students understand the meaning of using 10?
(10 minutes)	If there is some time left, ask students, while pointing to 25, what 2 means and what 5 means for 25. What is the meaning of different places?	

## 7. Data collection points:

- a) What strategies do students use to solve the problems?
- b) What do students use to guide their thinking (drawings, coins, fingers, etc.)?