

## Mathematics Lesson Plan for 3rd grade

For the lessons on Thursday Oct 15, 2009  
2009 Nueva Gifted Learning Conference  
3rd grade students from the Nueva School  
Instructor: Akihiko Takahashi

**a. Title of the Lesson: How many cards do we need to display the dates of the month on the wall?**

**b. Goals of the Lesson:**

- Students will deepen their understanding of the concept of place value notation through solving a problem related to children's everyday life.
- Students will understand that organizing their thinking processes and thinking logically are important for problem solving

**c. Instruction of the Lesson**

Understanding the base-ten place-value system is one of the most important objectives for the early grades. This notation system is based on the principles of grouping and place-value. In this system, objects are grouped by ten so that only ten symbols, the digit 0 through digit 9, are needed to represent any number of the objects. In order to represent any size of numbers in this system, the place that the digit appears in the numeral has a particular size of the group. For example, ones place represents how many of ones are there, tens place represents how many tens are there, and so on. Thus the 5 in 523 represents five hundreds and the 5 in 675 represents five ones. This means that the same digit can represent different number based on its place in the numeral.

Unless students understand that the each place in the numeral hold different value it is very difficult for students not only understanding or express numbers by using notation system but also understanding how the addition, subtraction, multiplication, and division work.

In order to deepen students' understanding of the concept of place value notation, this lesson is designed to help students think about how their previous learning of the base-ten place-value system can be used to solve problems in students' everyday life. Through the problem solving students are expected to deepen their understanding the concept of place value as well as to develop problem-solving skills. It is also expected that the solution to this problem, only six cards are sufficient to display the dates of month everyday through out a year, could attract students' interest in using mathematics in their life.

#### d. Plan of the Lessons

##### Goal of the lesson:

- Students will deepen their understanding of the place value notation through solving a problem related to students' everyday life

Steps, Learning Activities Teacher's Questions and Expected Student Reactions	Teacher's Support	Points of Evaluation
<p><b>1. Introduction</b> Encourage students to see the benefit of displaying the dates of the month on the wall in each classroom. Rather than writing the date of the month everyday, it might be a good idea to prepare some cards to display the dates so that you can use them instead of writing the dates all the time.</p>	<p>Help student awareness that you can save your effort if you prepare cards to display dates. Help student awareness that you do not need too many cards to display dates. Ask students to work in groups.</p>	<p>Do all the students understand that we do not need more than 31 cards to display the dates because the largest number of dates in a month is 31?</p>
<p><b>2. Posing the Problem</b> Think about how many cards we need to display the dates of the month on the wall in your classroom.</p> <p><b>3. Anticipated Student Responses</b> 20 cards 13 cards 12 cards 11 cards</p>	<p>Help students notice that we may not need 31 cards if we put a digit on each card and use them for ones and tens. Provide students actual blank cards if students request.</p>	<p>Do students recall what they learned previously?</p>
<p><b>4. Comparing and Discussing</b></p> <p><b>a. 20 cards</b> Cards for ones: 1, 2, 3, 4, 5, 6, 7, 8, 9, 0 Cards for tens: 1, 2, 3, 4, 5, 6, 7, 8, 9, 0</p> <p><b>b. 13 cards</b> Cards for ones: 1, 2, 3, 4, 5, 6, 7, 8, 9, 0 Cards for tens: 1, 2, 3</p> <p><b>c. 13 cards</b> Cards for ones: 1, 2, 3, 4, 5, 6, 7, 8, 9, 0 Cards for tens: 0, 1, 2</p> <p><b>d. 12 cards</b> Cards for ones: 1, 2, 3, 4, 5, 6, 7, 8, 9, 0 Cards for tens: 1, 2</p> <p><b>e. 12 cards</b> Cards for ones: 1, 2, 3, 4, 5, 6, 7, 8, 0 Cards for tens: 1, 2, 3</p> <p><b>f. 11 cards</b> Cards for ones: 1, 2, 3, 4, 5, 6, 7, 8, 0 Cards for tens: 1, 2</p>	<p>Begin the discussion with the group that shows the larger number of cards. Encourage students to share with other groups not only how many cards but also what kind of cards they want to prepare. Help other groups understand how the group came up with the idea and see if the method works for all the dates.</p> <p>For the fewest number of the cards, let each student make the cards and try one by one to make sure all the dates of a month can be displayed with 11 cards. (If a student does not want to use 6 to display 9, he/she can use 12 cards).</p>	<p>Does each student understand other students' ideas?</p> <p>Does each student understand that only 11 cards with a digit in each card are necessary to display all the dates of each month?</p>
<p><b>4. Extending the problem</b> How many cards do we need to display all the dates if you can use both sides of each card?</p>	<p>Provide students enough cards so that students can actually try to</p>	<p>Do the students understand the</p>

<p><b>5. Anticipated Student Responses</b></p> <p><b>6 cards</b></p> <ul style="list-style-type: none"> <li>• Front 1, 2, 3, 4, 5, 6</li> <li>• Back 0, 1, 2, 7, 8, 9</li> </ul> <p><b>6 cards</b></p> <ul style="list-style-type: none"> <li>• It looks like we can use only 6 cards to display the dates if we use both sides of cards.</li> <li>• What kinds of rules do we need to keep in mind so that the date cards created always work? <ul style="list-style-type: none"> <li>○ Any combination would work if the following pair of digits are not put on the same cards, 1 &amp; 1, 2 &amp; 2, 3 &amp; 0</li> </ul> </li> </ul>	<p>find how their ideas work.</p> <p>Help students understand that there are multiple correct solutions to this problem.</p>	<p>methods for display all the dates of month using both sides of six cards?</p>
<p><b>6. Summing up</b></p> <ul style="list-style-type: none"> <li>• Ask students to write what he/she learned from today's lesson.</li> </ul>	<p>Encourage students to use what is on the board to summarize what they learned from today's lesson.</p>	

**Evaluation:**

- Do students see that a digit can be used for not only ones but also tens place, i.e., 3 can be used not only for displaying 23rd but also 31st?
- Do students recall their understanding of decimal notation?
- Do students understand that organizing their thinking processes and thinking logically are important for problem solving?