

LESSON PLAN

Grade 1

October 6, 2009

Rochester Area Colleges Center for Excellence in Math & Science
Collaboration Event

WAYS TO MAKE TEN

I. QUESTION: What are some ways we can put two numbers together to make ten?

II. RATIONALE AND GOALS FOR THE UNIT:

Rationale:

- Ten is the foundation of our number system.
- Recognizing the numbers 1 through 10 with ten frames assists the transition from concrete to more abstract thinking about numbers.
- Decomposing and composing numbers is the basis for understanding regrouping in addition and subtraction.
- Composition and decomposition of ten is a key idea/skill in our base ten system.
- Gaining fluency with ten is a critical building block in the acquisition of number sense and proficiency with operations.

Goal:

Students will develop a more internalized understanding of how to make ten and the numbers up to ten with two addends.

III. NYS STANDARDS THAT RELATE TO THE UNIT: **NYS STANDARD 3 – MATHEMATICS**

PROCESS STRAND:

COMMUNICATION:

1.CM.3 Share mathematical ideas through the manipulation of objects, drawings, pictures, charts, and symbols in both written and verbal explanation

CONTENT STRAND:

NUMBER SENSE AND COMPUTATION:

1.N.17 Develop an initial understanding of the base 10 system:
10 ones = 1 ten, 10 tens = 1 hundred

1.N.29 Understand that different parts can be added to get the same whole

**IV. WHERE THE TOPIC FITS IN THE ELEMENTARY CURRICULUM,
K-6 NYS STANDARDS:**

Kindergarten	K.CM.2 Share mathematical ideas through the manipulation of objects, drawings, pictures, and verbal explanations K.N.9 Write numbers 1 – 10 to represent a collection K.N.13 Determine sums and differences by various means
1 st Grade	1.CM.3 Share mathematical ideas through the manipulation of objects, drawings, pictures, charts, and symbols in both written and verbal explanation 1.N.17 Develop an initial understanding of the base 10 system: 10 ones = 1 ten, 10 tens = 1 hundred 1.N.29 Understand that different parts can be added to get the same whole
2 nd Grade	2.CM.3 Share mathematical ideas through the manipulation of objects, drawings, pictures, charts, and symbols in both written and verbal explanation 2.N.6 Develop an understanding of the base 10 system: 10 ones = 1 ten, 10 tens = 1 hundred, 10 hundreds = 1 thousand 2.N.15 Determine sums and differences of number sentences by various means (e.g., families, related facts, inverse operations, addition doubles, and doubles plus one)
3 rd Grade	3.CM.5 Share organized mathematical ideas through the manipulation of objects, drawings, pictures, charts, graphs, tables, diagrams, models, symbols, and expressions in written and verbal form 3.N.6 Understand the place value structure of the base ten number system: 10 ones = 1 ten, 10 tens = 1 hundred, 10 hundreds = 1 thousand 3.N.18 Use a variety of strategies to add and subtract 3-digit numbers (with and without regrouping)
4 th Grade	4.CM.5 Share organized mathematical ideas through the manipulation of objects, drawings, pictures, charts, graphs, tables, diagrams, models, symbols, and expressions in written and verbal form 4.N.6 Understand the place value structure of the base ten number system: 10 ones = 1 ten, 10 tens = 1 hundred, 10 hundreds = 1 thousand, 10 thousands = 1 ten thousand 4.N.14 Use a variety of strategies to add and subtract numbers up to 10,000
5 th Grade	5.CM.4 Share organized mathematical ideas through the manipulation of objects, numerical tables, drawings, pictures, charts, graphs, tables, diagrams, models, and symbols in written and verbal form 5.N.3 Understand the place value structure of the base ten number system: 10 ones = 1 ten, 10 tens = 1 hundred, 10 hundreds = 1 thousand, 10 thousands = 1 ten thousand, 10 ten thousands = 1 hundred thousands, 10 hundred thousands = 1 million 5.N.21 Use a variety of strategies to add and subtract fractions with like denominators. 5.N.22 Add and subtract mixed numbers with like denominators. 5.N.23 Use a variety of strategies to add, subtract, multiply, and divide decimals to thousandths
6 th Grade	6.CM.4 Share organized mathematical ideas through the manipulation of objects, numerical tables, drawings, pictures, charts, graphs, tables, diagrams, models, and symbols in written and verbal form 6.N.16 Add and subtract fractions with unlike denominators. 6.N.18 Add, subtract, multiply, and divide mixed numbers with unlike denominators.

V. RATIONALE AND GOALS FOR THE STUDY LESSON:

Rationale:

- Children at this developmental level need many opportunities to practice composing and decomposing ten.
- Recognizing and using numbers in this lesson moves along the continuum of semi concrete (flower counters) to the semi abstract (ten frame) and then the abstract, symbolic (numerals).
- Students will explore in a structured way the ideas that 10 can be represented by the sum of two numbers and that there are multiple ways to use two addends to make ten.
- Students are beginning the journey toward a deep level understanding of ten that over time will enable them to acquire number and computational fluency.

Goals: Students will...

- find a variety of ways to put two numbers together to make 10.
- use counters and a ten frame to help them think about and solve the problem.
- record their thinking by a) coloring a ten frame with two colors to match the two addends, and b) writing the numbers represented by the two colors on the ten frame.
- talk about (explain/justify) their solutions to making ten.
- listen to their classmates explain their work and think about what they did.

VI. PRIOR UNDERSTANDINGS/EXPERIENCES, PREVIOUS LESSONS:

The focus is Unit 3 in the Tokyo Shoseki textbook, pages 21 – 23. Practice to reinforce the routines and procedures for using math tools (Toolkit A) on a work mat as well as recording and presenting their work continues.

Day 1: Making 5, page 21

Day 2: Making 6 and 7, page 22

Day 3: Making 8 and 9, page 23

Day 4: Games with the work mat, number cards, ten frame cards, magnetic flowers and the white magnetic board

Day 5: Using a five frame to find 2 addends that total 5

Day 6: Study lesson

VII. STUDY LESSON:

TEACHER	STUDENTS (anticipated responses)	NOTES AND EVALUATION POINTS
Good morning, First Grade! Let's wave to welcome our visitors. Are you ready for some fun with math? Okay..., let's get started!!	Good morning, Ms. Vaccaro and Ms. Colon! Hands wave. Yes! Uh-huh!! Silent applause	Students will have gathered on the rug/floor space). In front of each student is a laminated work mat (11 x 18" piece of construction paper), the green box that contains only number cards 1 to 10, and name plates with their first names. These are the materials they will need for the opening portion of the lesson.

<p>Please listen to all of the directions, and wait until I say, “<i>Do it now</i>,” before you do anything.</p> <p>Here is the first set of directions... Open the box, take out your number cards, and put the lid back on your box. Then set the box on the floor above your work mat. Do it now.</p> <p>Next, put out your number cards on your work mat so you can see all of them. Do it now.</p> <p>I will show you a ten frame, and I want you to hold up the number that matches it.</p> <p>Who can tell me, what will you do when I hold up a ten frame?</p> <p>Okay... Here is the first ten frame. What number is this? Show me the number card that matches it.</p>	<p>Students mostly prepare manipulatives as directed. Partners help each other as needed.</p> <p>We hold up the number card that matches.</p> <p>Children hold up the number card 3.</p> <p>An incorrect number card is held up for a ten frame.</p>	<p>Students are sitting next to the partner they will work with during the workshop. At the tables (desks?) the materials for each team of partners will need for the workshop are also in place - one work mat, one white magnetic board, a yellow box containing 10 red and 10 blue magnetic flowers, 1 red and 1 blue crayon and two name plates.</p> <p>Teachers use the word “<i>Freeze</i>” when needed to stop the action and gain students’ attention, e.g., for more directions or to move on to the next activity. Expected student response is to stop what they are doing and hold their empty hands up in front of them. Teachers, then, use the phrase “<i>Do it now</i>” as a signal for students to do what was asked.</p> <p>Question for observers: How do students arrange their cards? a single horizontal row? a ten frame format? randomly? If a student needs help arranging the cards, the teacher will quietly ask their partner to help.</p> <p>The teacher shows a ten frame that represents 3 and allows about 10 seconds for children to respond with a number card.</p> <p>Are students able to find quickly the number card they are looking for? Are they gaining fluency with common representations of numbers 1 – 10?</p> <p>To the child who picks up an incorrect card, the teacher</p>
--	--	--

<p>Please put your card back on your work mat. And get ready for the next ten frame...!</p> <p>Let's do something else with your number cards. So get ready... where should all of the number cards be now? Freeze.</p> <p>Let's think about what we did in math yesterday... Raise your hand when you are ready to tell me: what was one thing we did yesterday in math?</p> <p>Show me with your number cards one way we made 5 yesterday.</p> <p>I'm curious... why do you think we did those things with the flowers and the five frames?</p> <p>Look at all this work you did yesterday!</p>	<p>On my work mat.</p> <p>I don't know. I can't remember. We used flowers and the white board. We made 5. We colored the five frame dots red and blue.</p> <p>I had 1 and 4. I had 3 and 2. I had 2 and 3.</p> <p>I don't know. To make 5. It's a math game. To show different ways to make 5. If you fill up the five frame, you can tell you have 5. It's the same thing on the top row of the ten frame... when you fill up the top row, you</p>	<p>responds, "<i>Look again. What number is this?</i>" If needed then, "<i>Let's count the dots in the ten frame together... 1, 2, 3.</i>" Pause, and if needed, "<i>The number card you need is... 3.</i>"</p> <p>The procedure is repeated for the numbers 10 and 6. Teachers support as needed, e.g., with hand signal, touch on the shoulder or hand, with a question or a similar verbal reminder.</p> <p>Teacher prompts as needed... <i>What math tools did we use?</i> <i>What number were we looking for?</i> <i>Then what did we do?</i></p> <p>If a pair of numbers shown does not equal 5, teacher asks, <i>Would that be 5 altogether?</i> <i>What number do we want to show?</i></p> <p>Will students observe & comment when they see the same numbers repeated but in a different order?</p> <p>If needed, <i>what did we find out about making 5?</i></p> <p>Teacher opens the tri-fold display board that shows student work from yesterday. Depending on the response the teacher may bring out the tri-fold earlier in the discussion, which would provide the visual prompt students would have available in</p>
---	---	--

2: We're going to use our red and blue counters to show a 10.

1: I'm so glad we're partners! My favorite color is blue, can I do the blue parts?

2: Sure, so you're blue, and I'm red. What if I do the first part and you do the next part?

1: Okay.

2: I'm red, so I'll count out 6 red flowers and put them on the ten frame.... you always start with the top row. There. Now it's your turn.

1: I'm blue, so I'm going to use blue flowers to finish filling in the ten frame on the white board.

[Stepping back into a teacher role...] Now watch what we do next.

2: Okay, I'm red, so I'm going to use the red crayon and color in the dots on the ten frame on my paper so they match the red flowers I put on the ten frame over here. Let me see, how many flowers are there? 1,2,3,4,5,6. So I am coloring 6 dots.... 1,2,3,4,5,6.

1: I know that's right, because I know there are 5 in the first row and 1 more makes 6. And I'm blue. So I will color in the rest of the dots in the ten frame for the blue flowers... 1,2,3,4.

[In teacher role] There's one more thing we need to do. Who can tell me what that is?

Write the numbers that go with the dots on the ten frame.

previous experience, teacher role play, and a poster with icons for steps in the directions.]

Each recording paper has a ten frame outline:

And boxes to write the numbers:

<input type="text"/>	and	<input type="text"/>
----------------------	-----	----------------------

Additional recording charts will be provided as teams are ready for them. Students will raise their hands to show their work to the teacher and ask for another paper.

<p>2: That's right! I'm red, so I will use the red crayon to write... How many red dots are there?</p> <p>1: And I will use the blue crayon to write... How many blue dots are there again?</p> <p>2: Look at our poster - it's finished! That was fun. Let's raise our hands to ask for another paper.</p> <p>[Returning to teacher role] What was the first thing we did on our paper?</p> <p>What was the first thing we did with our math tools?</p> <p>What did we do next?</p> <p>What did we do last?</p> <p>[To each other] I think they are ready, what do you think?</p> <p>I think you're right! Boys and girls, tell us... are you ready to get to work?</p> <p>Now, listen carefully. You are going to move to the tables to work with your partners. When you get to the table, will you touch any of the things that are there?</p> <p>What will you wait to hear us say before you touch anything?</p>	<p>Write the numbers to show how many dots are red and how many dots are blue.</p> <p>6</p> <p>4</p> <p>You wrote your names.</p> <p>.</p> <p>You put the flowers on the on the white board.</p> <p>You colored dots to match how many red flowers and blue flowers you have.</p> <p>You wrote the numbers in the boxes.</p> <p>YES! Yay!</p> <p>No!</p> <p>Do it now.</p>	<p>As students explain each step, teachers point out the icon for that step on the large visual directions poster.</p>
--	--	--

<p>Okay, let's have one team of partners move to the table. Listen carefully... I want you to leave your work mat and the yellow box with the number cards right where they are on the floor. Then, walk carefully so you don't step on anyone - or anything! _____ and _____, please stand up and walk to your work place at the table. Do it now.</p> <p>Great! Now that everyone is at your work place, please turn to your partner, say 'Hi,' and smile. Now, shake your partner's hand. [freeze]</p> <p>Boys and girls, you have 10 minutes to show on your papers as many different ways to make 10 as you can. Remember, you will show ONE way on each paper.</p> <p>We will give you more paper if you need more. Just raise your hand, and we will bring it to you.</p> <p>What will you do when you hear us say, "<i>Boys and girls, give me five,</i>" at the end of the workshop time?</p> <p>Good, now show me with your fingers... what number are you and your partner going to make? [freeze]</p> <p>Let's get to work. Please start by writing your names on your paper. Do it now.</p>	<p>Hi! Hi! Smiles. Handshakes.</p> <p>Freeze. Put everything down and put your hands up.</p> <p>10 fingers displayed.</p>	<p>The rest of the students are sent to their spots at the tables in partner teams or as a group, depending on what the teachers sense they need at this point.</p> <p>Once the workshop is underway, members of the writing team will</p>
--	---	--

<p>Workshop.</p> <p>Boys and girls, give me five. [Freeze]</p> <p>Listen, please, for directions. I want you to, put your counters back in the box and put the lid on it. Please leave the white metal board, the yellow box and the two crayons on top of your work mat. Do it now. [Freeze]</p> <p>Now, when I call you and your partner, please bring your work and come to the rug. Be sure to sit by your name card and next to your partner.</p> <p>Let's see some ways you found to make 10...</p> <p>_____ and _____, please bring your chart up here, and tell us the numbers you used to make ten.</p>	<p>I'll be red, if you take blue. What are we supposed to do? Remember, we're going to make ten with red and blue flowers? Oh yeah. Like this? Uh huh, except I think we can't use 6 because the teachers used 6. Are we supposed to fill the ten frame on the paper with flowers? What do we do with the extra flowers? Let's stack and play chase with them.... We're not supposed to.</p> <p>We used 5 and 5.</p>	<p>pick up the work mats and green boxes of number cards left on the carpet. Student name plates will remain to mark their places.</p> <p>There are two goals for the workshop: the academic task to find two addends to make 10 and the social skills goals to take turns doing the work and use I CARE language with each other.</p> <p>10 – 15 minutes are allotted for the workshop, allowing for at least 12 minutes of reflection and closure at the end of the lesson. Writing team members will support the few students who may need one to one adult help even when working with a partner.</p> <p>When all have assembled and settled into their places, teachers open a tri-fold display board with a big 10 at the top. Charts that have sums of 10 will be clothes-pinned onto that board as students share their work.</p> <p>A separate tri-fold labeled "Also Interesting" will be available if any students share charts where addends equal numbers other than ten.</p> <p>Each team of partners will share one of their charts, as time allows. To set the tone for the sharing, teachers begin with a</p>
--	--	--

<p>Why did you choose those numbers? Teacher calls on another team. Tell us the numbers you used. Why did you use those numbers?</p> <p>How did you know which number to put with 2?</p> <p>Who else is ready to share?</p> <p>Which team haven't we heard from yet?</p> <p>What do you mean that's the same?</p> <p>So that's how they're alike. What's different about the numbers on their charts?</p> <p>You mean you can switch the numbers around, and you still get 10?</p> <p>_____ and _____, please bring one of your charts up here so we can talk about it.</p>	<p>Because they make 10.</p> <p>We have 2 and 8.</p> <p>2 is my favorite number so I picked 2, and I made them blue because I like blue best.</p> <p>We needed 8 more to fill the ten frame. You count the circles that are not colored on the ten frame.</p> <p>We have... _____ and _____. [1 and 9, 2 and 8, 3 and 7, 4 and 6, 7 and 3, 8 and 2, 9 and 1 are possible.]</p> <p>We have 8 and 2. That's the same as _____'s.</p> <p>This one has an 8 and _____ has an 8, and over here there's 2 and there's 2.</p> <p>This one has the 8 first and that one has the 8 last. They're sort of alike and different.</p> <p>Yeah.</p> <p>We have 6 and 4 [<i>but the numbers written in the boxes are 7 and 4</i>].</p>	<p>team of students who are confident and eager. Next they choose those who completed one chart, followed by those who have two or more charts they can choose from in order to display as many ways to make 10 as we can.</p> <p>If partners struggle to tell what they did, teachers prompt as needed: <i>What can you tell us about your poster?</i> <i>What do you have on your ten frame?</i> <i>Why didn't you put a 3 with the 2 you have there?</i></p> <p>For this lesson it does not matter whether the teams started with red or blue dots in the ten frames.</p> <p>If the ten frame shows ten dots filled in accurately but the numbers in the boxes are incorrect, the teacher asks the students to count the red and blue dots with their finger. If the students recognize the error they made, they correct their papers. If students do not catch their error, teacher asks them to explain how they know it is 7, which probably was by counting. Teacher then can point out how</p>
---	---	---

<p>And it looks like we have two more teams. _____ and _____, please bring your chart up here and tell us about your work.</p> <p>And it looks like we have one more team....</p> <p>Let's take a quick stretch and wiggles break. Stretch your arms over your head. Wiggle your nose. Everybody, smile!!</p> <p>What did you learn in math today? Look at all this work you did today! Let's think about what you see here...</p>	<p>We have 1 and 9 [<i>their ten frame shows 9 and 1</i>].</p> <p>We have 4 and 4.</p> <p>Stretch. Wiggles. Smile.</p> <p>There are a lot of 10's up there. There are a lot of ways to make 10. You can use numbers to show</p>	<p>easy it is to miscount if we do not concentrate, so we need to be very careful when we work.</p> <p>If a team reverses the numerals from what they had on their ten frame, the teacher asks them to show where 9 are on the ten frame and where 9 the numeral is. Their paper is added to the 10 poster.</p> <p>If the addends show a sum other than 10, the teacher invites the team and class to look at their work again and check how many are there. If the pair seem on track to be able quickly to correct the error [<i>and there is sufficient time before the period ends!</i>], the teacher can suggest they go work on it a little more and come back to share. If it appears they need more support than time allows, teacher may say, <i>That's a great combination, but we can't put it with our tens. We'll put it over here and start with it tomorrow.</i></p> <p>If a combination is repeated, the teacher points out that the same combinations will result in the same sum regardless who did the work. Their work will also be posted, probably below the like one already there.</p> <p>Teachers prompt as needed... <i>What did you do today?</i> <i>What did that show?</i> <i>What do you mean?</i> <i>What do you know about using a ten frame to find numbers that make ten?</i></p>
--	---	---

<p>What does all this work show us about making ten?</p> <p>How is it easy? What makes it easy?</p> <p>Oh, I see there are others who agree with you.</p> <p>So-o-o-o-o, no matter how many flowers you have of each color, if you fill up the ten frame, how many flowers do you know have to be there?</p> <p>How do you know?</p> <p>Boys and girls, did you hear what _____ just said? That's really important math thinking.</p> <p>Let's look, at these two sets of posters again... It is pretty interesting to think about what you did yesterday and compare it to what you did today... When you look at both sets of posters, what do you notice?</p>	<p>what you have instead of all those dots. It was kind of hard when... I liked...</p> <p>Making ten is easy on a ten frame.</p> <p>When you have all the dots on a ten frame filled in, you have ten! Fill in all the dots, and you have 10.</p> <p>Children are showing the 'I agree' sign.</p> <p>10!</p> <p>When a ten frame is full, you have ten. Because it's sort of like you touched the dots with one of your fingers and you had finger paint on them. If you fill in the top row, that's 5 and then there have to be 5 in the second row because they match up. And 5 and 5 make 10. So if the whole ten frame is filled up, that's 10.</p> <p>And if you want to know for sure, you can count.... 1,2,3,... 10.</p> <p>We did more work today.</p>	<p>Teachers gesture toward the tri-fold displays, the one with yesterday's work making 5 and the ones showing today's work.</p>
--	---	---

<p>Did you have fun today in math? We did too. Thank you for working hard in math today.</p> <p>It's time for lunch. So, let's wave goodbye to our visitors.</p>	<p>There are more ways to make 10 than when you make 5. Just red and blue is boring. We should use more colors</p> <p>Yes.</p> <p>I'm hungry.</p> <p>Children wave.</p>	<p>Observers depart.</p>
--	---	--------------------------

VIII. FOLLOW UP LESSONS:

- Reviewing today's work, "What did we do yesterday?"
- Continued practice showing any number 1 through 10 on a ten frame and considering "how many more to make 10" with a variety of game formats
- "Hiding" game for 5 and 10 magnetic flowers, other items, in hand and with a ten frame
- Introduction to tiles and holders on page 25 in the textbook to find ways to make 10, beginning by arranging the five frame tracks in a ten frame format (one above the other to make a 2 x 5 grid), then moving them side by side to show a horizontal (1 x 10) row.

IX. HOMEWORK GAME FOR THE WEEK:

- Students use the ten frame kit (laminated cover stock ten frame cards that represent the numbers 1 – 10 and laminated 3 x 2 1/2 - inch numeral cards 1 – 10) to play "*How many more to make 10?*"
- For variation they can also play/practice games from previous weeks with the ten frame kit, "*Say the number for the ten frame,*" "*Say the number without counting – then count to check,*" "*Order the ten frames/number cards from smallest to largest*" and "*Concentration*" first with ten frames and number cards upside down in two separate areas, then mixed together.