

NZ
Numeracy
Project

Activities

Stage

Four

Adding and Subtracting with Counters – Stage Four

Skill Number: 4:8

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:8	Recalling the facts up to 10, and the teen facts	MCC.1.OA.6

Required Resource Materials:

- Counters

Activity:

Addition Problem to 10 (*groupings within 10*):

State the following problem:

"Fred jumped 4 times in the morning and then jumped 6 times in the afternoon. How many times did he jump in all?"

Record $4 + 6$ on the board. The students can begin by using counters to solve the problem. However, the goal for a stage 4 student is to gradually remove the use of counters and image the collections to solve the problem.

Record $4 + 6 = 10$ on the board. Have student record $4 + 6 = 10$ on paper as well.

Continue with word problem stories and recordings for: $0 + 10, 1 + 9, 2 + 8, 3 + 7, 5 + 5, 6 + 4, 7 + 3, 8 + 2, 9 + 1, 10 + 0$

Addition Problem - Pattern to 10 (*doubles and 5-based*):

State the following problem:

"Janice has 3 apples. She buys 3 more apples. How many apples does she have now?"

Record $3 + 3$ on the board. The students can begin by using counters to solve the problem. However, the goal for a stage 4 student is to gradually remove the use of counters and image the collections to solve the problem.

Record $3 + 3 = 6$ on the board. Have student record $3 + 3 = 6$ on paper as well.

Continue with word problem stories and recordings for: $1 + 1, 2 + 2, 4 + 4, 5 + 5$

Addition Problem with 10 (*groupings with 10 and recalls "tens and" facts*):

State the following problem:

"Jose caught 10 baseballs in April and 3 baseballs in May. How many baseballs did he catch in all?"

Record $10 + 3$ on the board. The students can begin by using counters to solve the problem. However, the goal for a stage 4 student is to gradually remove the use of counters and image the collections to solve the problem.

Record $10 + 3 = 13$ on the board. Have student record $10 + 3 = 13$ on paper as well.

Continue with word problem stories and recordings for: $10 + 0, 10 + 1, 10 + 2, 10 + 4, 10 + 5, 10 + 6, 10 + 7, 10 + 8, 10 + 9, 10 + 10$

Addition Problem to 20 (*groupings within 20 and addition facts to 20*):

State the following problem

"Tracy read 15 pages on Monday and 5 pages on Tuesday. How many pages did she read in all?"

Record $15 + 5$ on the board. The students can begin by using counters to solve the problem. However, the goal for a stage 4 student is to gradually remove the use of counters and image the collections to solve the problem.

Record $15 + 5 = 20$ on the board. Have student record $15 + 5 = 20$ on paper as well.

Continue with word problem stories and recordings for: $0 + 20, 1 + 19, 2 + 18, 3 + 17, 4 + 16, 5 + 15, 6 + 14, 7 + 13, 8 + 12, 9 + 11, 10 + 10, 11 + 9, 12 + 8, 13 + 7, 14 + 6, 16 + 4, 17 + 3, 18 + 2, 19 + 1, 20 + 0$

Subtraction Problem from 20 (*subtraction facts from 20*):

State the following problem:

"Jenny had 20 coins but she lost 6 of them. How many coins does she have left?"

Record $20 - 6$ on the board. The students can begin by using counters to solve the problem. However, the goal for a stage 4 student is to gradually remove the use of counters and image the collections to solve the problem.

Record $20 - 6 = 14$ on the board. Have student record $20 - 6 = 14$ on paper as well.

Continue with word problem stories and recordings for: $20 - 0, 20 - 1, 20 - 2, 20 - 3, 20 - 4, 20 - 5, 20 - 7, 20 - 8, 20 - 9, 20 - 10, 20 - 11, 20 - 12, 20 - 13, 20 - 14, 20 - 15, 20 - 16, 20 - 17, 20 - 18, 20 - 19, 20 - 20$

Addition Problem - Doubles to 20:

State the following problem

"Grace received \$6 for her birthday from her grandmother. Her mom also gave her \$6. How much money does she have in all?"

Record $6 + 6$ on the board. The students can begin by using counters to solve the problem. However, the goal for a stage 4 student is to gradually remove the use of counters and image the collections to solve the problem.

Record $6 + 6 = 12$ on the board. Have student record $6 + 6 = 12$ on paper as well.

Continue with word problem stories and recordings for: $1 + 1, 2 + 2, 3 + 3, 4 + 4, 5 + 5, 7 + 7, 8 + 8, 9 + 9, 10 + 10$

Source URL: <http://nzmaths.co.nz/resource/adding-and-subtracting-counters>

Adding Tens and Ones – Stage 4

Skill Number: 4:12

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:12	Solving addition and subtraction problems using groups of tens	<i>MCC.1.NBT.4</i> <i>MCC.1.NBT.6</i> <i>MCC.2.NBT.8</i>

Required Resource Materials:

- Ones and tens materials. E.g. Beans, play money, sticks in bundles

Activity:

Using Manipulatives:

Problem: "Ray has \$34, and he gets \$25 for a birthday present. How much money does Ray have now?"

Record $34 + 25$ on the board. The students model 34 and 25 using the chosen materials and group the ones and tens. Discuss the answer and record $34 + 25 = 59$ on the board.

Examples: Create word stories and recording for: $45 + 22$, $52 + 13$, $42 + 25$, $35 + 43$, $53 + 25$, $43 + 22$...

Using Representation:

Bridging from Manipulatives to Representation Only:

Examples: Create word stories and recording for: $14 + 43$, $31 + 25$, $23 + 41$, $24 + 25$, $32 + 26$, $38 + 21$, $13 + 41$, $25 + 23$, $44 + 24$...

Using Number Properties (Abstract):

Examples: Create word stories and recording for: $87 + 12$ $73 + 26$ $24 + 52$ $16 + 62$ $81 + 17$...

Challenging examples: The students will need to understand the meaning of three-digit numbers to do these: $241 + 21$ $342 + 44$ $643 + 21$ $27 + 210$ $303 + 44$ $25 + 510$...

Source URL: <http://nzmaths.co.nz/resource/adding-tens-and-ones>

Adding Tens - Stage Four

Skill Number: 4:12

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:12	Solving addition and subtraction problems using groups of tens	<i>MCC.1.NBT.4</i> <i>MCC.1.NBT.6</i> <i>MCC.2.NBT.8</i>

Required Resource Materials:

- Dark cover (black construction paper or dark fabric can be used)
- Ones and tens materials (base ten blocks, sticks in bundles, play money, etc.)

Activity:

Required Knowledge: Before attempting this activity check that students can:

- Instantly recall the addition facts with answers up to 10
- Interchange instantly the "ty" words with "tens" e.g., sixty means six tens, fifty means five tens

The activities that follow are important because they simultaneously help develop addition, subtraction and place value concepts.

Using Materials:

State the following problem:

"Hemi has 39 pieces of bubble gum and buys a packet of 20 more pieces of bubble gum. How many does he have altogether?"

Record $39 + 20$ on the board. Have student model 39 then 20 on tens and ones material. The students work out the answer using material and then discuss the answer.

Record $39 + 20 = 59$ on the board. Have student record $39 + 20 = 59$ on paper.

Continue with word problem stories and recordings for: $35 + 20$, $42 + 10$, $20 + 34$, $21 + 50$, $40 + 27$...

Using Materials and Shielding:

Write $51 + 30$ on the board and have student **build and show** each number separately. Cover the two built numbers under a shield (dark paper, cloth, etc.). Have student imagine the two built numbers in his head. Ask him how many tens are in each number. Discuss the idea that because $5 + 3 = 8$ then 5 tens and 3 tens = 8 tens so $51 + 30$ must be 81. *(It is here that the instant recall of basic facts is needed).*

Record $51 + 30 = 81$ on the board. Have student record $51 + 30 = 81$ on paper.

Continue with word problem stories and recordings for: $37 + 30$, $63 + 20$, $70 + 25$, $41 + 40$, $60 + 11$...

Using Imaging:

Write $34 + 20$ on the board and have student **explain** how he would build 34 and 20 separately. Have him imagine the two built numbers in his head. Ask him how many tens are in each number. Discuss the idea that because $3 + 2 = 5$ then 3 tens and 2 tens = 5 tens so $34 + 20$ must be 54. (*It is here that the instant recall of basic facts is needed*). Record $34 + 20 = 54$ on the board. Have student record $34 + 20 = 54$ on paper. Continue with word problem stories and recordings for: $45 + 20$, $72 + 10$, $60 + 34$, $11 + 50$, $40 + 53$...

Using Number Properties:

Continue by creating word stories and recordings for: $18 + 20$, $30 + 24$, $23 + 40$, $13 + 50$, $10 + 46$, $87 + 10$, $78 + 20$, $20 + 62$, $46 + 50$, $80 + 17$.

Challenging examples. The students will need to understand the meaning of three-digit numbers to do these: $340 + 20$, $640 + 30$, $423 + 20$, $50 + 204$...

Source URL: <http://www.nzmaths.co.nz/resource/adding-tens>

Addition Dice - Stage Four

Skill Number: 4:10

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:10	Solving addition problems to 100 by counting on in their head	MCC.2.NBT.5

Required Resource Materials:

- Number dice or spinner (1 to 6, 7 to 12, 13 to 18)
- A dot die with the six obscured counters

Activity:

The teacher throws the number die, counts out counters to match the number thrown, and then covers the counters with a piece of paper.

The student throws the dot die. Example: The teacher asks: "There are 6 dots under here and 3 dots on the die. How many dots are there altogether?"

The teacher allows time to solve the problem and might re-pose it, or briefly display the counters under the card.

Continue the activity using different numbers generated by the dice.

As children become familiar with the activity, counting out the counters from the first throw is not needed. The range of numbers on the number die can be increased.

Notes:

- The numbers chosen for this activity should take account of children's facility with the forward number word sequence (FNWS).
- An extension of this activity is to have two numbered dice with the numbers on the second die restricted to the range 1 to 5.
- Activity is suitable for small groups or pairs.

The context can be varied by using, for example, cubes and paper clips.

Source: Martland, James; Stafford, Ann; Stanger, Garry; Wright, Robert, *Teaching Number in the Classroom with 4-8-year-olds*, SAGE, Los Angeles, p. 56.

Addition Flash Cards – Stage Four

Skill Number: 4:8

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	<p>Counting from One by Imaging</p> <p>The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.</p>
4	<p>Advanced Counting</p> <p>The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.</p>

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:8	Recalling the facts up to 10, and the teen facts	<i>MCC.1.OA.6</i>

Required Resource Materials:

- Flash cards +/-

Activity:

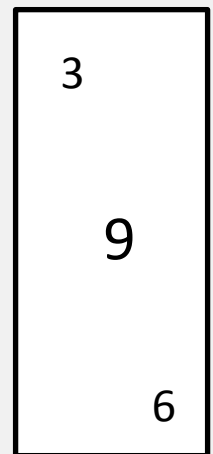
Show the students a flash card and follow the example below:

Example: the card to the right shows 3, 9, 6. Practice all 12 combinations of every basic fact.

Ask problems like: $6 + 3$, $9 - 6$, $9 - 3$, $6 + ? = 9$

The complete list of 12 questions needed for each card is like this:

$3 + 6 = ?$	$? + 6 = 9$	$3 + ? = 9$
$6 + 3 = ?$	$? + 3 = 9$	$6 + ? = 9$
$9 - 6 = ?$	$? - 6 = 3$	$9 - ? = 3$
$9 - 3 = ?$	$? - 3 = 6$	$9 - ? = 6$



Source URL: <http://www.nzmaths.co.nz/resource/addition-flash-cards>

Array Games – Stage Four

Skill Number: 4:13

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4.13	Solving multiplication problems using skip counting by twos, fives, and tens.	<i>MCC.3.OA.1</i> <i>MCC.3.OA.3</i>

Required Resource Materials:

- 2 dice
- Grid for recording

Activity:

- Students play in pairs, each with their own grid.
- Each player rolls the dice and colors in a rectangular area on the grid indicated by the dice. For example if they roll a 2 and a three they color in any 2x3 rectangle.
- The students should write the number of squares in the rectangle to indicate the product of the two sides.
- The first player to color in all the squares in their grid wins.
- As the grids fill up players will roll totals that will not fit on the grid, you can allow them to break up the factors if you choose. For example a student might identify that 6x4 is the same as 2x4 and 4x4. This implicitly reinforces the distributive law of multiplication.

The size of the grid will determine the length of the game. Players could use pre-drawn and photocopied grids provided by the teacher.

Source URL: <http://nzmaths.co.nz/resource/array-game>

Arrow Cards – Stage Four

Skill Number: 4:5

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:5	Ordering the numbers in the range 0-100	<i>MCC.1.NBT.3</i>

Required Resource Materials:

- Arrow Cards 1-100

Activity:

Give student a set of arrow cards 1-100. Have him make the number 49 by overlapping the arrow cards of '40' and '9'. Be sure the student knows that the points of both cards must be lined up. Have student state "40 and 9 make 49."

Call out the following set of numbers (one at a time): 45, 32, 89, 71, 26, 14, 93, 57, 78, 60

Have the student make each number with the arrow cards. Be sure the student says the two numbers plus the total number when constructing each number.

When finished constructing all of the numbers, have the student put them in order from least to greatest and then from greatest to least.

Continue with other number sets:

- 31, 79, 80, 12, 94, 23, 45, 57, 66, 8
- 59, 92, 11, 6, 27, 82, 33, 70, 44, 65
- 90, 58, 26, 5, 72, 19, 34, 47, 61, 83
- 64, 46, 90, 9, 31, 13, 28, 82, 57, 75

Source URL: <http://www.nzmaths.co.nz/resource/arrow-cards>

Bead Strings - Stage Four

Skill Number: 4:2; 4:4; 4:5; 4:7; 4:9

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:2	Saying the forwards and backwards number word sequence in the range 0-100, starting and ending with any number	MCC.K.CC.2
4:4	Number order: What comes before and after a given number in the range 0-100	MCC.K.CC.2
4:5	Ordering the numbers in the range 0-100	MCC.1.NBT.3
4:7	Saying the forwards and backwards number word sequences in the range 0-100 for twos, fives, and tens	MCC.2.NBT.2
4:9	Recalling the number of 10s within decades that add to 100	MCC.1.NBT.4

Required Resource Materials:

- Bead strings with 100 beads in groups of five
- Twisty ties (from bread wrappers)

Activity:

Show the student a bead string. Use twisty ties to label the beginning and end of the string as 0 and 100. Ask the students to use grouping strategies to locate the multiples of 10, beginning with 50 (half way), 10 and 90. Tag these numbers on the string.

Now state other numbers in the range 0-100 and have the students find efficient ways to locate the numbers. Encourage grouping strategies. For example, 75 is found by identifying the position half way between 50 and 100. When each number is found have the student do the following:

- State the number of tens in the number
- State the number that comes before the number
- State the number that comes after the number
- Begin at 0 and count up to the target number by twos, then by fives, then by tens
- Begin at 100 and count backwards to the target number by twos, then by fives, then by tens

As an independent activity, give the students bead strings and a set of tags with numbers already on them. The students place each tag in its correct position on the string. Partners check each other's' strings.

Source URL: <http://www.nzmaths.co.nz/resource/bead-strings>

Beep - Stage Four

Skill Number: 4:7

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:7	Saying the forwards and backwards number word sequences in the range 0-100 for twos, fives, and tens	

Required Resource Materials:

- Hundreds board with flip capability

Activity:

The students stand in a circle. Decide on a multiple of two or five that will be the "beep" numbers. Select a student to start counting from one. It is important that all the students count aloud. For example, for counting in fives: "1, 2, 3, 4, **beep**, 6, 7, 8, 9, **beep**, 11 ...". When a student says "**beep**", they sit down. The game continues until only one student is left standing. This activity can be used to reinforce the forwards and backwards counting sequences. Use a hundreds board to assist the students to visualize the patterns. Flip over the spoken numbers, but leave the "beep" numbers unflipped.

Extension Activity:

Have two multiples going at the same time. For example, threes (say "**beep**") and fives (say, "**buzz**"). If the number is a multiple of both three and five, then the person says "**buzz-beep**". So, the sequence goes "1, 2, **beep**, 4, **buzz**, **beep**, 7, 8, ..., 11, **beep**, 13, 14, **buzz-beep**....." Begin the counting sequences at different starting numbers. For example, "3, 7, 11 ..." or "100, 97, 94, 91," These patterns will help the students to recognize algebraic relationships.

Source URL: <http://www.nzmaths.co.nz/resource/beep>

Biscuit Boxes – Stage Four

Skill Number: 4.14

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:14	Solve division problems by equal sharing in ones, twos, and fives	<i>MCC.3.OA.2</i> <i>MCC.3.OA.3</i>

Required Resource Materials:

- Unifix cubes
- Small cardboard packets (optional)

Activity:

Using Materials:

Problem: I'm giving you all a job at the biscuit factory. I want you to pretend that these cubes are biscuits. Make twenty biscuits for me. Encourage the students to make their biscuits in stacks with five breaks of color for easy counting:



Now you have to put the biscuits into packets. You are going to put five biscuits in each packet. How many packets will you be able to make with twenty biscuits?

Encourage the students to predict the number of packets. Some may do this using the color pattern of the stacks, take one cube off each group of five to form four fives.

Allow the students to divide the cubes up into fives and record the operation, $20 \div 5 = 4$. Discuss the meaning of the \div symbol as "put into sets of". Pose similar examples using the biscuit factory scenario using divisors of ones, twos, and fives. With each problem encourage the students to apply any addition and multiplication fact knowledge they have to predict the result of the operation. Record each operation to consolidate meaning of the symbols.

Suitable examples might be:

Twelve biscuits shared into packets of two ($12 \div 2 = 6$)

Fourteen biscuits shared into packets of two ($14 \div 2 = 7$)

Thirty biscuits share into packets of five ($30 \div 5 = 6$)

Twenty-four biscuits shared into packets of one ($24 \div 1 = 24$)

Using Imaging:

Shielding and Predicting: Set up problems in which the batch of biscuits is made and hidden under container. Ask the students to predict how many packets of a given number can be formed. For instance, tell students there are 18 biscuits in packets of 2. Ask how many packets there will be. Record the operation on a post-it or piece of paper fastened to the top of the container, eg. $18 \div 2 =$

Challenge the students to find answers using the number fact knowledge they have. For example: "If you made two packets of two, how many of the biscuits would you use?" "What about three packets of five?" "Can you use this to think ahead and work out how many packets can be made using 18 biscuits?"

Note that the difficult part of a skip-counting strategy is to track how many repeated additions are made. If necessary, unmask the materials and share the cubes to confirm the students' predictions. Suitable examples might be: $10 \div 2 =$ □ $15 \div 5 =$ □ $16 \div 1 =$ □ $20 \div 5 =$ □ $60 \div 2 =$ □

Using Number Properties:

Ask other division problems, using the biscuit company scenario, for example: $16 \div 2 =$ □
 $24 \div 2 =$ □ $12 \div 2 =$ □ $30 \div 5 =$ □ $90 \div 5 =$ □ The students record the problems as division equations and solve them by applying their strategies and number knowledge.

Source URL: <http://nzmaths.co.nz/resource/biscuit-boxes>

Blank Grids – Stage Four

Skill Number: 4.13

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4.13	Solving multiplication problems using skip counting by twos, fives, and tens.	<i>MCC.3.OA.1</i> <i>MCC.3.OA.3</i>

Required Resource Materials:

- Blank Multiplication grid
- Whiteboard pen
- Blank Grid for students (with quadrants shaded)

Activity:

Note: This activity would be most beneficial following the use of the "Smiley Hundreds" activity.

The goal of this activity is for students to use known five facts or skip-counting by fives to help them determine facts they don't know. Have students look at the grid. Ask them to describe what they notice about the grid.

(Sections of 25 are shaded; each section is 5 rows of 5.)

X	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

Have students mark the "last" square in each section (25, 50, 50, and 100). Encourage student to use skip-counting by 5's to find the last square in each section.

Choose another square on the grid. Have students use their skip counting by fives to find the product that belongs in that square. Have the student write the fact for that square. For example, if you point to the square for 6 x 5, students could count by fives six times across to find 30. If you point to 6 x 6, students could use skip counting the 5 x 5 area within the 6 x 6 and count the extra squares surrounding this section within 6 x 6. Continue with different squares within the grid to have students find the products using their knowledge of skip-counting by

fives.

Source URL: <http://www.nzmaths.co.nz/resource/blank-grids>

Bridges – Stage Four

Skill Number: 4.8

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4.8	Recalling the facts up to 10, and the teen facts	<i>MCC.1.OA.6</i>

Required Resource Materials:

- Strings of 100 beads in color groups of five with decades marked with supermarket tags
- Die
- Bridges game (Material Master 4-34)

Activity:

The students should play the game Bridges to consolidate up through 10 and back through 10 strategies.

Give each small group of students a bead string, a dice, and a different colored clothespin for each player. Players take turns to roll the dice and work out where their clothespin will go when the number of beads is jumped. For example, a player who has their peg at bead 8 and throws a seven must predict that jumping three beads will get their peg to 11, then check this by moving their peg.

Source URL: <http://www.nzmaths.co.nz/resource/bridges>

Bridges Game – Stage Four

Skill Number: 4.8

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4.8	Recalling the facts up to 10, and the teen facts	MCC.1.OA.6

Required Resource Materials:

- Bridges Game Boards (*Photocopy the boards using the color of card shown on the top right corner and laminate them.*)
- Standard Set of Dominoes (*Discard the following dominoes: 6-6, 0-0, 0-1, 0-2, 0-3, 0-4, 0-5, 0-6*)

Activity:

Bridges is played in pairs. Players co-operate to fill all of the domino spaces of their game boards. The color of the boards must be the same.

Step 1: Spread out the dominoes (after discarding the dominoes listed above) face up so the dots can be seen.

Step 2: The students place dominoes on their game boards to make "bridges".

The rules for placing dominoes are:

- The total number of dots on the domino must equal the difference of the two numbers between which it is placed, e.g. the 1-4, and 2-3 dominoes could be placed between 23 and 28 as the difference and total dots are five.
- Some dominoes must cross a decade bridge. For example moving from the thirties (38) to the forties (44) crosses the decade bridge of 40.
- When crossing a decade bridge the dots on each side of the domino must match the differences on each side of the decade number. For example, the 2-4 will bridge 40 as $38 + 2 = 40$, and $40 + 4 = 44$.

Players continue until all of the domino places are filled.

Source URL: <http://www.nzmaths.co.nz/resource/bridges>

Building Teens – Stage Four

Skill Number: 4:8

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:8	Recalling the facts up to 10, and the teen facts	MCC.1.OA.6

Required Resource Materials:

- Two Tens Frames for each student
- Counters
- Teacher can use a whiteboard and colored pens to show this

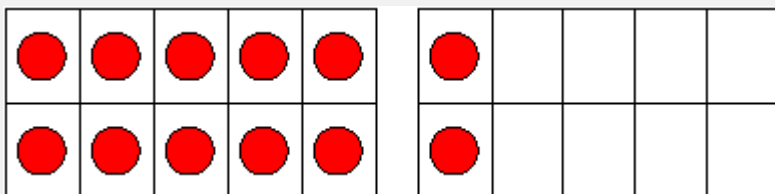
Activity:

Use two tens frames and say, "How would you arrange 12 counters on the frames? How did you decide to show 12 this way?" Then ask the group, "What do you notice about the counters on the frames?"

Encourage a variety of responses.

Ask other students to show 12 in different ways.

Use other teen numbers each time, and repeat the questions.



Source URL: <http://www.nzmaths.co.nz/resource/building-teens>

Card Ordering - Stage Four

Skill Number: 4:5

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:5	Ordering the numbers in the range 0-100	MCC.1.NBT.3

Required Resource Materials:

- Four sets of number cards 1-100.

Activity:

The object of the game is to play the cards in order and be the student to play the cards that has 100 on it.

Place the 4 ones cards face up to begin four stacks. Shuffle the cards. Deal each student five cards. A student with a two card begins by placing it on top of the one. Students take turns putting one card on a stack of their choice. They must add to the stacks in sequence from 1 to 100. After each student has had their turn, they pick up a new card from the pack.

If a student cannot go, then they keep picking up cards from the pack until they can go. The student who plays the 100 collects the stack. They receive a point and put that stack of cards to one side. The students continue to play their cards until there are no cards left and all four stacks of 1 to 100 have been completed.

Note: If four stacks to fifty are too much, lower then amount of stacks to 3, 2, or 1. Also, a specific range of numbers (for example 36 to 58) may be chosen instead of the complete set of 100.

Source URL: <http://www.nzmaths.co.nz/resource/card-ordering>

Change Unknown - Stage Four

Skill Number: 4:10

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:10	Solving addition problems to 100 by counting on in their head	MCC.2.NBT.5

Required Resource Materials:

- Set of counters

Activity:

Using Materials:

State the following problem:

"A class is growing beans from bean seeds. They leave school on Monday, six seeds have sprouted. When they come to school on Tuesday morning, they find that eight seeds have sprouted altogether. How many seeds have sprouted overnight?"

Discuss why the problem amounts to solving $6 + \square = 8$. The students solve the problem with counters and discuss their methods. Encourage the students to count on by pointing at their fingers and saying "seven, eight, so the answer is two."

Record $6 + 2 = 8$ on the board.

Examples: Word stories and recording for: $4 + \square = 6$, $5 + \square = 6$, $7 + \square = 8$, $7 + \square = 8$, $7 + \square = 9$, $6 + \square = 8$, $6 + \square = 9$...

Using Imaging:

Shielding and Imaging Only:

Examples: Word stories and recording for: $12 + \square = 14$, $8 + \square = 10$, $12 + \square = 15$, $7 + \square = 11$, $8 + \square = 11$, $9 + \square = 12$...

Using Number Properties:

Examples: Word stories and recording for: $87 + \square = 89$, $43 + \square = 45$, $79 + \square = 83$, $51 + \square = 54$, $\square + 56 = 59$, $\square + 43 = 45$, $58 + \square = 63$...

Source URL: <http://www.nzmaths.co.nz/resource/change-unknown>

Clapping - Stage Four

Skill Number: 4:1; 4:2

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:1	Rote counting 0-100	MCC.K.CC.1
4:2	Saying the forwards and backwards number word sequence in the range 0-100, starting and ending with any number	MCC.K.CC.2

Required Resource Materials:

- None

Activity:

By **clapping hands** in time, the student:

- Counts from 0 to 100
- Counts from a number other than 1 and stops at a specific number (between 1 and 100)
- Counts backwards from 100 to 0
- Counts backwards to a different number (other than 100) and stop at a specific number (between 0 and 100)

By **clapping hands and slapping knees alternately** in time, the student:

- Counts from 0 to 100
- Counts from a number other than 1 and stops at a specific number (between 0 and 100)
- Counts backwards from 100 to 0
- Counts backwards to a different number (other than 100) and stop at a specific number (between 0 and 100)

By **slapping knees, then chest, then clapping hands alternately** in time, the student:

- Counts from 0 to 100
- Counts from a number other than 1 and stops at a specific number (between 0 and 100)
- Counts backwards from 100 to 0
- Counts backwards to a different number (other than 100) and stop at a specific number (between 0 and 100)

Source URL: <http://nzmaths.co.nz/resource/clapping>

Close to 100 - Stage Four

Skill Number: 4:9

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:9	Recalling the number of 10s within decades that add to 100	MCC.1.NBT.4

Required Resource Materials:

- Ones and Tens chart (drawn by students)
- Dice

Tens	Ones

Activity:

Have each player draw a column for "tens" and a column for "ones". The aim of the game is to get a total as close to 100 as possible. The student tosses a dice and decides whether the number will be put in the ones or the tens place. For example, if a four is thrown, it could either be 40 or four. The dice is rolled a total of seven times. All seven numbers must be used. The total of all the columned numbers may exceed 100, but the students will need to decide which player has a total that is closest to 100.

Source URL: <http://www.nzmaths.co.nz/resource/close-100>

Comparisons with Number Cards - Stage Four

Skill Number: 4:6

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:6	Comparing two numbers in the range 0-100 using number cards	MCC.1.NBT.3

Required Resource Materials:

- Number Cards (one set of cards 1-100 for each student)

Activity:

Give each student a set of number cards (1-100) and pair them with a partner. Have them each shuffle their cards. Tell one of the pair to turn over a card and say the number. Tell the other student to turn over a card and say the number. Ask questions such as "*Who has the biggest number? Who has the smaller number? Which number is the greatest? Which number is the least?*"

Have the students verbalize which number is the greatest and which is the least. For example, "*The number 84 is greater than the number 57*" or "*The number 21 is less than the number 45.*"

Continue until all cards are compared. Play multiple times to practice comparing multiple pair combinations. Students may also want to play in teams of three to have more numbers to compare.

Source: Martland, James; Stafford, Ann; Stanger, Garry; Wright, Robert; *Teaching Number in the Classroom with 4-8-year-olds*, SAGE, Los Angeles, p. 54.

Counting - Stage Four

Skill Number: 4:1; 4:2

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:1	Rote counting 0-100	<i>MCC.K.CC.1</i>
4:2	Saying the forwards and backwards number word sequence in the range 0-100, starting and ending with any number	<i>MCC.K.CC.2</i>

Required Resource Materials:

- Large Hundreds Board (preferably one that is laminated and can be written on with dry erase marker)
- Rekenrek with 100 beads (one for each student)

Activity:

With Hundreds Board

Have students clap as they count in ones to 100. Mark off each number on the hundreds board as they are said. Practice the number sequences forwards and backwards. Ask the students to identify individual numbers on the hundreds board from the sequence they have just counted.

With Rekenrek

Have students count aloud as they move one bead at a time on the Rekenrek from one side to the other. Practice the number sequences forwards and backwards (moving beads from left to right and from right to left).

Source URL: <http://www.nzmaths.co.nz/resource/counting>

Counting as We Go - Stage Four

Skill Number: 4:1; 4:2; 4:4; 4:5

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

<i>Stage</i>	<i>Behavioural Indicator</i>
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:1	Rote counting 0-100	<i>MCC.K.CC.1</i>
4:2	Saying the forwards and backwards number word sequence in the range 0-100, starting and ending with any number	<i>MCC.K.CC.2</i>
4:4	Number order: What comes before and after a given number in the range 0-100	<i>MCC.K.CC.2</i>
4:5	Ordering the numbers in the range 0-100	<i>MCC.1.NBT.3</i>

Required Resource Materials:

- Objects to pass around

Activity:

The students get into groups and arrange themselves in circles. Choose a student in each group to start at 1. They then pass an object around and count as it passes each student. The students count as far as 100.

Examples. Repeat counting from 1.

Challenging examples. The group selects a single digit number. Repeat the above activity, but count backwards from the selected number. Before counting back the students predict who will be number 1. They check their prediction by passing an object and counting down out loud.

More challenging examples. Give all groups the same starting number. All groups count forward (up to 100). Play some music. When you stop the music each student draws the group's current number in the air. Record the numbers of all groups on the board and discuss whose number is biggest.

Source URL: <http://nzmaths.co.nz/resource/counting-we-go>

Counting Back - Stage Four

Skill Number: 4:11

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:11	Solving subtraction problems to 100 by counting back in their head	MCC.2.NBT.5

Required Resource Materials:

- Number cards 1 to 20

Activity:

State the following problem: "Michelle has 11 sweets and eats 4. How many are left?"

Record $11 - 4$ on the board. Model the 11 sweets with number cards labeled in order 1 to 11.

Ask which 4 sweets would Michelle eat and how many will be left. The students need to connect with the idea the removing sweets 1 to 4 does not solve the problem but removing sweets, 11, 10, 9 then 8 does because the set 1 to 7 remains. Complete $11 - 4 = 7$ on the board.

Examples: Encourage students to track on their fingers which sweets got eaten using word stories and recording for: $13 - 4$, $9 - 2$, $19 - 3$, $12 - 4$, $11 - 5$, $9 - 3$, $12 - 4$...

Using Imaging and Imaging Only:

Shielding and Imaging Only:

Examples: Word stories and recording for: $12 - 3$, $19 - 2$, $17 - 3$, $8 - 21$, $21 - 4$, $15 - 5$...

Using Number Properties:

Examples: $81 - 2$, $90 - 2$, $78 - 3$, $62 - 4$, $92 - 4$...

Source URL: <http://www.nzmaths.co.nz/resource/counting-back>

Fraction Animals – Stage Four

Skill Number: 4:15

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Description	Aligned to CCGPS
4:15	Finding halves and quarters of sets, regions, and objects by sharing	<i>MCC.3.OA.2</i> <i>MCC.3.OA.3</i>

Required Resource Materials:

- Fraction Animals sheet

Activity

Background

Halving as the opposite of doubling may be a worthwhile piece of learning that can develop from discussions around the answers to exercise 3, where students are just halving numbers.

Remember that students who have not reached stage 6 in the "basic facts" domain have not learned all of their basic multiplication facts, so a multiplicative strategy based purely on the numbers may not work for all students.

Comments on the Exercises

Exercise 1

Asks students to solve word problems that involve finding unit fractions of a set.

Exercise 2

Asks students to solve word problems. These word problems are more complex than Exercise 1. Students are asked to identify the fraction and then the answer.

Exercise 3

Asks students to solve a set of problems that asks them to find one half of a number.

Exercise 4

Asks students to solve a set of problems that asks them to find one third of a number.

Exercise 5

Asks students to solve a set of problems that asks them to find one quarter of a number.

"You have cut each wafer into three pieces. What could you call each piece?" (one third)

"How many of those pieces will each person get?"

If the students do not have the language of thirds, tell them about it.

For example, "One-third and another one-third is called two-thirds."

Record the students' findings using symbols.

For example, $1/3 + 1/3 = 2/3$.

Pose other similar problems to see if the students can image a way to anticipate the sharing of cookies.

"There are five people at the party and six wafers. How much wafer will each person get?"

Using Number Properties

The students have a good understanding of equal sharing when they can anticipate the result using the properties of the numbers involved rather than relying on images. The number size is increased to promote generalization.

"Suppose I put you in groups of six people. Each group would get four cookies. How much cookie would each person get?"

Look for responses like:

"They will get more than one-half but less than one."

"How do you know?"

"It takes three cookies to give each person one-half, but to give them each one whole cookie would take six."

"That would be the same as three people sharing two cookies."

Source URL: <http://www.nzmaths.co.nz/resource/fraction-animals>

Imaging Many Hands – Stage Four

Skill Number: 4.8

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4.8	Recalling the facts up to 10, and the teen facts	MCC.1.OA.6

Required Resource Materials:

- none

Activity:

Problem: "Leanne has 8 sweets and she buys 5 more sweets. How many does she have now?"

Discuss the context of the problem. Select two students to represent the quantities used in the problem (5 and 8). Using their fingers, students create the numbers behind their backs. Each student discusses how they made the number (I used five fingers on one hand and three on the other). Students now discuss how they could combine the two quantities as represented on their hands. They discuss how they would put 5 and 5 together to give 10 and 3 fingers. If students are unable to combine the sets through imaging, have students show their fingers. Have the group discuss their methods. Discuss and record student solution strategies on the board, such as how the eight was decomposed.

Problem: Leanne has 8 sweets and she ate 5 of them. How many does she have now?

Discuss the context of the problem. Select two students to help represent the problem by having one student represent the known part of the whole (5). The objective of the second student is to identify the missing part of the whole. The discussion should include what whole should be represented (8) and the strategies used to identify the missing part of the whole knowing that one part is 5. After the discussion, the second student should represent the unknown part behind their back. Both students reveal their parts to confirm that both parts equal the whole. Have the group discuss their methods. Discuss and record student solution strategies on the board, such as how the missing part was identified.

*Although the skill description specifically mentions counting back from twenty, thinking addition strategies is another effective way to identify differences.

Source URL: <http://www.nzmaths.co.nz/resource/imaging-many-hands>

Knocks and Taps - Stage Four

Skill Number: 4:1; 4:2; 4:3; 4:4

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:1	Rote counting 0-100	<i>MCC.K.CC.1</i>
4:2	Saying the forwards and backwards number word sequence in the range 0-100, starting and ending with any number	<i>MCC.K.CC.2</i>
4:3	Numerical recognition 0-100	<i>MCC.1.NBT.1</i>
4:4	Number order: What comes before and after a given number in the range 0-100	<i>MCC.K.CC.2</i>

Required Resource Materials:

- Number Cards 1-100

Activity:

Have the student sit directly in front of you with his back to you. Give student the number cards 1-100. Knock and tap a specific number of times on the student's back and then have him hold up the number card that corresponds (a 'knock' represents '10' and a 'tap' with one finger represents '1'). Continue with different numbers.

Once comfortable with identifying the number of knocks and taps, have the student also show the number card for the number before and the number after the specific number.

After holding up the number card for a specific number of knocks and taps, have the student rote count to that specific number starting with 1. Also have him count backwards from the specific number down to 1. Also have him start or finish on a number other than 1.

To practice skip counting, have the student count by 2's, 5's, and 10's to the specific number or backwards from the specific number.

Source URL: <http://nzmaths.co.nz>

Lily Pads - Stage Four

Skill Number: 4:1; 4:2; 4:3; 4:4

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:1	Rote counting 0-100	<i>MCC.K.CC.1</i>
4:2	Saying the forwards and backwards number word sequence in the range 0-100, starting and ending with any number	<i>MCC.K.CC.2</i>
4:3	Numeral recognition 0-100	<i>MCC.1.NBT.1</i>
4:4	Number order: What comes before and after a given number in the range 0-100	<i>MCC.K.CC.2</i>

Required Resource Materials:

- Large Number Cards 0-100 (you can use large number flashcards or write numbers on large blank index cards or create large number cards on the computer)

Activity:

Tape large number cards in order of 0-100 on the floor (or hallway) to create "lily pads". The student acts as a frog and jumps on specific numbers, sequences of numbers, or the number just after or before a given number.

Note: Due to the large number of 'lily pads' (number cards) you may choose to focus on specific sequences of numbers such as 21-30, 31-40, 41-50, etc. instead of the entire sequence of 0-100.

Source URL: <http://nzmaths.co.nz/resource/number-mat-and-lily-pads>

Lucky Dip - Stage Four

Skill Number: 4:3

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

<i>Stage</i>	<i>Behavioural Indicator</i>
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:3	Numeral recognition 0-100	<i>MCC.1.NBT.1</i>

Required Resource Materials:

- A container
- Numeral cards 0-100

Activity:

Show the students a card and ask them what number it is. "Draw" the number in the air with your hand. "Draw" the number on the table, board, or floor in large writing. Have students also "draw" the number in the air then the table, desk, floor, etc. Repeat with further cards.

Source URL: <http://nzmaths.co.nz/resource/lucky-dip>

Make Ten – Stage Four

Skill Number: 4:8

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4.8	Recalling the facts up to 10, and the teen facts	<i>MCC.1.OA.6</i>

Required Resource Materials:

- Counters

Activity:

Using Materials:

Problem: Tina catches 6 fish, Miriam catches 7 fish and Liam catches 4 fish. How many do they catch altogether?

Record $6 + 7 + 4$ on the board. The students model this with three piles of counters. Ask if there are two numbers that can be combined to make the numbers easier to add. Encourage them to add the 6 and 4 first to give 10. Add the third pile of counters to get a sum of 17. Discuss with the students the idea of seeing 10 and some more. Record the answer.

Examples: Sample problem sets to incorporate into word problems that focus on the "make tens" strategy:
 $5 + 2 + 5$, $9 + 5 + 1$, $8 + 3 + 7 + 2$, $3 + 5 + 5 + 7$, $4 + 6 + 4 + 9 + 6$, $3 + 6 + 4 + 9 + 7$...

Using Imaging:

Problem: Jonny eats 9 girl scout cookies. Lindsay eats 7 girl scout cookies. Heather eats 1 girl scout cookie. What is the total number of girl scout cookies that were eaten?

Record $9 + 7 + 1$ on the board. Encourage students to visually image these numbers. Ask if there are two numbers that can be combined to make the numbers easier to add. Encourage them to add the 9 and 1 first to make 10. Add the third number to get a sum of 17. Discuss with the students the idea of imaging the numbers and finding two numbers that make 10. It then makes it easier to add the third number mentally. Record the answer.

Examples: Sample problem sets to incorporate into word problems that focus on the "make tens" strategy:
 $6 + 2 + 4$, $8 + 5 + 2$, $8 + 9 + 2$, $1 + 5 + 9$, $4 + 6 + 4$, $5 + 5 + 7$...

Using Properties of Numbers: Write these numbers on paper and cross out pairs of ten to get the answers. Students should not be using the paper and pencil to calculate the numbers, but rather to track the sets of ten they have already used. When students become successful, try putting the numbers on the board and have the students mentally cross out the numbers as they use them.

$8 + 7 + 2$, $7 + 3 + 2$, $5 + 2 + 3 + 7$, $1 + 2 + 6 + 4$...

Source URL: <http://www.nzmaths.co.nz/resource/make-ten-0>

More Ones and Tens – Stage Four

Skill Number: 4:7

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:7	Saying the forwards and backwards number word sequences in the range 0-100 for twos, fives, and tens	<i>MCC.2.NBT.2</i>

Required Resource Materials:

- Arrow cards
- Play Money (One dollar bills and Ten dollar bills)

Activity:

Problem: In pairs, one student shows a two digit number using the arrow cards. The other student creates this number using play \$1.00 and \$10.00 bills. Students count aloud to reinforce the concept of counting tens and then ones. Then students swap roles.

Challenging Examples: Repeat with three digit numbers.

Source URL: <http://www.nzmaths.co.nz/resource/more-ones-and-tens>

Number Boggle – Stage Four

Skill Number: 4.8

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4.8	Recalling the facts up to 10, and the teen facts	<i>MCC.1.OA.6</i>

Required Resource Materials:

- Number Boggle Card (Material Master 4-35)

Activity: Draw this grid on the board and give the students two or three minutes to write as many addition and subtractions equations as they can based around these digits.

15	9	6	7
3	12	8	5
7	4	13	2
5	1	11	10

The numbers in the equation must be connected vertically, horizontally, or diagonally. For example, with this grid, these are acceptable: $15 - 12 = 3$, $5 + 7 = 12$ (using the 5 and 7 from the bottom of the 1st column but not 7 and 5 from top of the 4th column), $15 - 3 - 7 = 5$

Equations involve two or more numbers, and one or more operations, but no number can be used twice. The students compare their equations in groups. They gain points for each equation that they have recorded. One point is given for each number used in the equation, for example, $15 - 3 - 7 = 4 + 1$ earns five points! The player with the most points wins.

Source URL: <http://www.nzmaths.co.nz/resource/number-boggle>

Number Fans - Stage Four

Skill Number: 4:1; 4:2; 4:3; 4:4

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:1	Rote counting 0-100	MCC.K.CC.1
4:2	Saying the forwards and backwards number word sequence in the range 0-100, starting and ending with any number	MCC.K.CC.2
4:3	Numeral recognition 0-100	MCC.1.NBT.1
4:4	Number order: What comes before and after a given number in the range 0-100	MCC.K.CC.2

Required Resource Materials:

- Fan Numbers Sheet

Activity:

The students use the fans to show numbers. Teacher states a number between 0 and 100 and the student holds up that number in the fan (student folds under the numbers not being called). Have student rote count from 0-100 showing each number with the fan. Have student count backwards from 100 showing each number. Have student show the numbers that come before and after a specific number using the fan numbers. Have student show 10 more and 10 less from a specific number. Have student create a set using objects (in the range from 1-100) then show the amount using the fan numbers.

Source URL: <http://nzmaths.co.nz/resource/number-fans>

Number Hangman – Stage Four

Skill Number: 4:3, 4:4, 4:7

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:3	Numeral recognition 0-100	<i>MCC.1.NBT.1</i>
4:4	Number order: What comes before and after a given number in the range 0-100	<i>MCC.K.CC.2</i>
4:7	Saying the forwards and backwards number word sequences in the range 0-100 for twos, fives, and tens	<i>MCC.2.NBT.2</i>

Required Resource Materials:

- Whiteboard or any type of board, chart paper, etc.

Activity:

Place dashes on the whiteboard to indicate how many digits are in the number. Numbers for this activity need to remain in the range of 0 - 120 (CCGPS Standard)

H T O
— —

The students can ask questions about specific places, like, "Is there a five in the tens place?" They may also ask digit related questions, like, "Does the number have the digit eight anywhere?" "Is the tens digit odd?" or "Is the 7 hundreds digit greater than five?"

Each time you answer "No" to their question, add a piece to the hangman. It is the teacher's discretion to have Hangman figure be as detailed as time allows (include eyes, nose, mouth, etc.) If they guess the correct digit, place that digit about the appropriate dash in the correct column.

Encourage the students to develop a way to be systematic by using lists of digits and eliminating as they receive answers.

Once the number has been guessed, have students state the number that comes before and after the given number and say the forwards and backwards number word sequences in the range 0-100's for twos, fives, and tens.

Source URL: <http://www.nzmaths.co.nz/resource/number-hangman>

Number Line Flips - Stage Four

Skill Number: 4:1; 4:2; 4:3; 4:4

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:1	Rote counting 0-100	MCC.K.CC.1
4:2	Saying the forwards and backwards number word sequence in the range 0-100, starting and ending with any number	MCC.K.CC.2
4:3	Numeral recognition 0-100	MCC.1.NBT.1
4:4	Number order: What comes before and after a given number in the range 0-100	MCC.K.CC.2

Required Resource Materials:

- Number Line Flips Sheet

Activity:

Construct the number line flaps (see 'Number Line Flips' Sheet) so that a number line can be inserted to create 'hidden' numbers. Insert any of the number lines containing the numbers 1-100 (from the 'Number Line Flips' sheet) and have the student flip up the first and last number on the number line. Point to one of the hidden numbers on the line and have the student state which number it is. Flip up the flap to check for correctness. Continue by using different numbers and number lines. Expand the activity by having the student state the number that comes before and after the hidden number. Have student count up to a certain number from the hidden number. Have student count backwards from the hidden number.

Source URL: <http://nzmaths.co.nz/resource/number-line-flips>

Number Strips– Stage Four

Skill Number: 4:7; 4:13

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:7	Saying the forwards and backwards number word sequences in the range 0-100 for twos, fives, and tens	MCC.2.NBT.2
4.13	Solving multiplication problems using skip counting by twos, fives, and tens.	MCC.3.OA.1 MCC.3.OA.3

Required Resource Materials:

- Transparent colored counters
- Number strips (1-100) (Material Master 6-1)

Activity:

Diagnostic Snapshot:

Put down counters of different colors to show, for example, 4 groups of 3 in one row. Ask the students questions such as: "How many counters are there altogether?" "If we counted them in twos, how many counters would there be?" Students who skip count for the first question and then reply 12 to the second question without re-counting need not to complete this activity.

Using Materials:

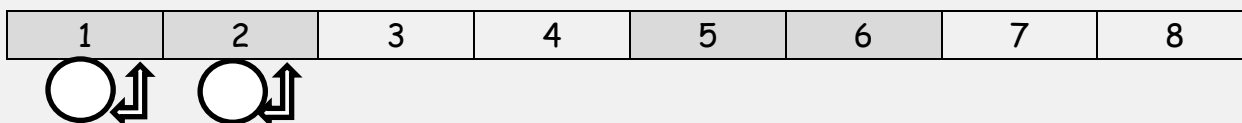
Lay down six sets of two counters. Make each set of counters the same color.



Problem: I am going to put these counters onto a number strip like this (put the first two counters onto the strip covering 1 and 2. When I put all of the counters on, what will be the last number I cover?)

Let the students try to image the process of counters being moved.

Have students take turns placing a pair of counters on the next numbers. Each time ask for predictions about the end-point number:



If I put two more counters onto the strip, how many will I have?

When all the counters are placed, point to the counter at the end of each color break and get the students to say the numbers, "2, 4, 6, 8, ..." To encourage imaging turn the strip over so the numbers are not visible and replace the counters. Point to given counters and ask students to tell you what number would be under the counter.

Record the operation using the symbols $6 \times 2 = 12$.

Ask predictive questions like, "I have six sets of two. How many counters would I have if I put on/took off a set of two?" Record the result using symbols, $7 \times 2 = 14$ or $5 \times 2 = 10$.

Pose similar problems with counters and the number strip such as: Five sets of three (5×3), four sets of four (4×4).

Using Imaging:

You will have students hide/cover materials to promote the use of imaging.

Problem: Turn over the number strip so that the numbers are face down. Ask four students to get five counters of one color and hide them under their hands. Confirm the fiveness of each set by getting students to lift their hands then replace them.

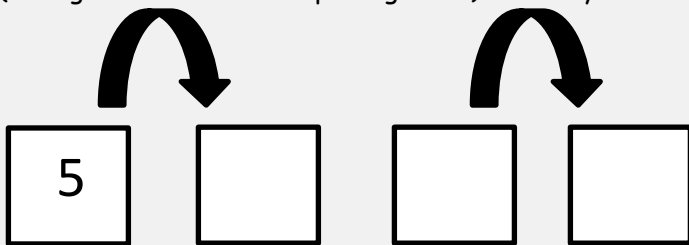
Ask: How many counters have we got altogether under these hands? If I put all of the counters on the number strip, what will be the last number I cover?

Let the students try to solve the problem through imaging. Focus them on using doubles or skip counting knowledge:

"How many counters are in these two hands altogether? (5 and 5, that's ten). How many will be in these two? (another ten). How many is that altogether? (ten and ten is twenty)."



"How many counters are under these hands? (five) Imagine I put them on the number strip. Here are another five (lifting the hands then replacing them). How many is that so far on the number strip? And another five?"



If necessary, fold back into materials by putting the sets of counters onto the number strip. Record the results using equations, for example, $4 \times 5 = 20$, or, $5 + 5 + 5 + 5 = 20$. Ask the students how many counters there would be if another five were added or taken away. Encourage them to build on from the previous total rather than counting from one. Pose similar problems using imaging, ensuring the number chosen are accessible for skip counting.

Nine sets of two ($9 \times 2 = 18$) then $8 \times 2 = 16$ and $10 \times 2 = 20$

Three sets of four ($3 \times 4 = 12$) then $4 \times 4 = 16$ and $5 \times 4 = 20$

Using Number Properties:

Students have a good understanding of *Counting On* when they can use skip counting sequences to solve multiplication problems. Write multiplication equations and discuss what they mean.

For example: $7 \times 2 = ?$ means, "seven sets of two is the same as fourteen."

Other suitable examples are: $6 \times 5 = ?$, $10 \times 2 = ?$, $5 \times 3 = ?$, $6 \times 4 = ?$.

Independent Activity:

Play a game of "Hit the Spot". Students need counters, a number strip and a 1-6 die. Decide on the spot number, 10, 12, 15, 16, 18, 20, and 24 are good choices as they have many factors. Players take turns to roll the die (say three comes up). If they can make up to the spot number exactly, in sets of that die number (three), they get a point. So in this case four sets of three makes twelve. Students can model the counts with counters if they need too (putting four sets of three on the strip will reach twelve exactly). The student with the most points after five dice rolls wins.

Source URL: <http://www.nzmaths.co.nz/sites/default/files/Numeracy/2008numPDFs/NumBk6.pdf>
(page 8 - 10)

Number Tiles – Stage Four

Skill Number: 4:10

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:10	Solving addition problems to 100 by counting on in their head	MCC.2.NBT.5

Required Resource Materials:

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Activity:

Using Materials:

Problem: Michael has 9 sweets in one bag and 2 sweets in another bag. How many sweets does he have altogether?

Write $9 + 2$ on the board. Get students to arrange tiles 1 to 9 in order. Shield numbers 10 and 11 in your hand. Ask what are the numbers on the sweets (tiles) in your hand then what does $9 + 2$ equal. Then lay down tiles 10, 11 to check the answer is 11.

Complete $9 + 2 = 11$ on the board.

Examples: (Second number is 5 or less). Word problems and recording for: $4 + 2$, $7 + 2$, $12 + 2$, $7 + 3$, $12 + 3$, $16 + 3$

Using Imaging:

Students/Teacher will cover the materials in efforts to promote imaging.

Solve 8 oranges plus 4 oranges. Turn the tiles numbered 1 to 8 over to hide the numbers. Hold the next 4 tiles (9 to 12) in your hand ask the students to imagine what numbers you have. Ask what $8 + 4$ equals. If needed, turn the 8 tiles over and tiles 9 to 12 to the end.

Encourage students to use their fingers to count on. Write $8 + 4 = 12$ on the board.

Examples: Word stories and recording for: $12 + 2$, $9 + 2$, $11 + 3$, $12 + 3$, $13 + 3$, $8 + 4$, $7 + 4$, $11 + 5$

Imaging Only:

Examples: Word stories and recording for: $11 + 4$, $7 + 2$, $13 + 5$, $11 + 5$, $18 + 2$, $6 + 5$, $13 + 5$

Using Number Properties:

By increasing the size of the first number in addition problems students are encouraged to let go of the use of materials or imaging and instead concentrate on the properties of the numbers.

Examples: Word stories and recording for: $29 + 4$, $46 + 5$, $63 + 5$, $78 + 3$, $34 + 4$, $89 + 3$

Challenging Examples: $158 + 3$, $198 + 5$, $212 + 4$, $238 + 4$, $394 + 5$, $117 + 2$, $392 + 4$

Source URL: <http://www.nzmaths.co.nz/resource/number-tiles>

Peek-a-Boo Adding - Stage Four

Skill Number: 4:10

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:10	Solving addition problems to 100 by counting on in their head	MCC.2.NBT.5

Required Resource Materials:

- A collection of counters of one color and a collection of another color
- Two pieces of paper or cloth

Activity:

Briefly display and then hide six counters of one color. Example statement: "Here are six red counters."

Briefly display and then hide three counters of the second color. Example statement: "Here are three green counters. How many counters altogether?"

Provide time for students to solve the problem. Look for students to begin with amount of one set and count on using the amount within the second set.

Continue the activity with collections such as 8 and 2, 11 and 4, 5 and 2, and so on.

Notes:

- The purpose of these tasks is to see if the child uses counting on.
- Some children might solve these tasks by counting from one. They are apparently unable to use counting on to solve these kinds of tasks.
- In the case of children who are not able to solve these tasks, the second collection (green counters) can be uncovered.
- The general approach with these tasks is to have the number of counters in the second collection typically in the range 2 - 5, and number in the first collection larger than the number in the second collection. The number in the first collection can be in the range 4 to 20 or beyond 20.

Source: Martland, James; Stafford, Ann; Stanger, Garry; Wright, Robert; *Teaching Number in the Classroom with 4-8-year-olds*, SAGE, Los Angeles, p. 54.

Pipe Cleaner Numbers - Stage Four

Skill Number: 4:3

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

<i>Stage</i>	<i>Behavioural Indicator</i>
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:3	Numeral recognition 0-100	<i>MCC.1.NBT.1</i>

Required Resource Materials:

- Three pipe cleaners for each student

Activity:

Say a number between 0 and 100. Have the student make that number with the pipe cleaner(s). For 2-digit numbers, be sure the student has the numerals in the correct position (for example: 31 *not* 13)

Source URL: <http://nzmaths.co.nz/resource/pipe-cleaner-numbers>

Playdough Fractions – Feeding Animals – Stage Four

Skill Number: 4:15; 4:16

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Description	Aligned to CCGPS
4:15	Finding halves and quarters of sets, regions, and objects by sharing	<i>MCC.3.OA.2; CC.3.OA.3</i>
4:16	Finding simple fractions of regions	<i>MCC.1.G.3; MCC.2.G.3; MCC.3.G.3</i>

Required Resource Materials:

- 3 sets of animals (these could be models or pictures)
- Playdough Fractions – Feeding Animals sheet
- Playdough Fractions – Feeding Animals Food sheet
- Five food trays (or paper plates)
- Playdough
- Plastic knives
- Cutting boards (or paper plates)
- Five set loops (can be string or yarn to separate each set of animals)

Activity

Warm up

Count in halves up to a number such as 3. ("1/2, 2/2, 3/2, 4/2, 5/2, 6/2") Be prepared for students to carry on counting and not realize that 6/2 is equal to 3).

Ask the students:

How many halves did we count (six halves = three wholes, write on the board)

How many halves do you think would equal 6? Write on the board

How many halves do you think would equal 9? Write on the board

Relate back to their knowledge of doubles and halves.

Feeding the Animals

This is an activity for up to six students working in two teams. Its purpose is to introduce the concept described above. One team acts as animal keepers, the other works in the zoo kitchen. The latter need to be more numerous, since there is more work for them to do.

A set of animals is chosen. Suppose that this is set 1. The kitchen staff look at the menu and sets to work preparing eels. The animal keepers put the animals in their separate enclosures (set loop). They may choose how many of each.

For example:

The animal keepers, one at a time, come to the kitchen and ask for food for each kind of animal in turn. The kitchen staff cut the eels as required:

Animal Keepers may say:

Zoo Kitchen Staff may say:

"Food for 2 elephants please"

"Here it is, 2 whole bales of hay"

"Food for 5 giraffes please"

"5 third parts. Tell them not to leave any scraps."

"Food for 3 rhino please"	"Here you are. 3 half parts from 2 bales of hay. There is one half part left."
"Food for 5 zebra please"	"Here you are 5 quarters or 5 fourth parts."
"Food for 6 sheep please"	"6 fifth parts. Lucky sheep."

Each time the animal keeper checks that the amounts are correct, and then gives its ration to each animal. The keepers also check each other's work.

When feeding time is over, the food is returned to the kitchen for reprocessing. Steps 1 to 4 are then repeated with different animals, keepers and kitchen staff.

Note that the eels, slabs, and hay should be of standard sizes.

Note also that the eels, after their head and tails are removed, resemble the eels in a cylinder shape and the slabs of meat and hay are oblongs.

Source URL: http://www.nzmaths.co.nz/resource/fraction-bits-and-parts?parent_node=

Playdough Fractions - Same but Different – Stage Four

Skill Number: 4:15; 4:16

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

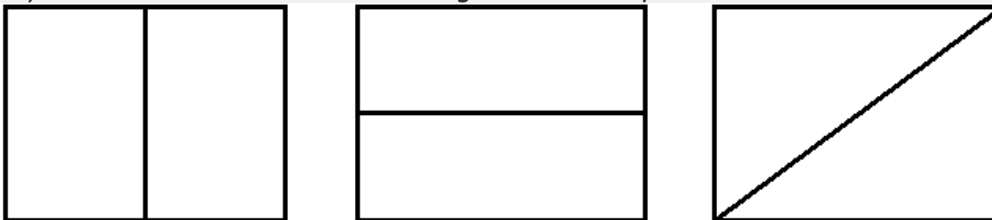
	Skill Description	Aligned to CCGPS
4:15	Finding halves and quarters of sets, regions, and objects by sharing	<i>MCC.3.OA.2; MCC.3.OA.3</i>
4:16	Finding simple fractions of regions	<i>MCC.1.G.3; MCC.2.G.3; MCC.3.G.3</i>

Required Resource Materials:

- Start - Action - Result Chart (for chocolate bars)
- Playdough (see Playdough Recipe)
- Plastic knives
- Cutting boards or paper plates to cut on

Activity

1. Review knowledge about equal parts.
What can we remember about fractions and equal parts? Write students' comments on board or chart paper.
2. Give each student or pairs of students one copy of the Start - Action - Result Chart (for chocolate bars) . Ask students to complete the first 3 lines (making halves in three different ways). *There are three simple ways see if you can find them.* The three straightforward ways are:



3. Next, they complete the next two lines (the third parts) which offers only two straightforward ways.
4. Complete the second page (the fourth-parts). There are six ways of doing this which are fairly easy to find.
5. Some students may want to go back to the halves board and see if they can find some more.

Source URL: http://www.nzmaths.co.nz/resource/fraction-bits-and-parts?parent_node=

Rocket – Where Will I Fit? – Stage Four

Skill Number: 4.5

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

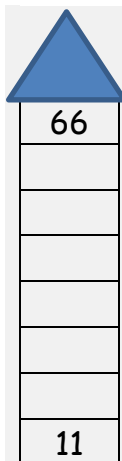
Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:5	Ordering the numbers in the range 0-100	MCC.1.NBT.3

Required Resource Materials:

- Standard 1 - 6 dice



Activity:

Each student needs to draw a "rocket" playing board like the one shown. The number of floors on the rocket can be increased where larger whole numbers are involved. The aim of the game is to fill every floor of the rocket with numbers in order.

If a player cannot place a number they have thrown, they miss that turn. Players take turns to roll a dice two times. From the numbers thrown, the students decide which two digit number they will use. For example, if five and three is thrown, the student could use 53 or 35.

The students then record the number on a level of the rocket where they think it best fits between 11 and 66. Once a number is written it cannot be moved.

Extention: If you want to extend the rocket range from 0 - 99 use a dodecahedral 0-9 dice.

Source URL: <http://www.nzmaths.co.nz/resource/rocket-where-will-i-fit>

Teddy Bear Walk - Addition - Stage Four

Skill Number: 4:10

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

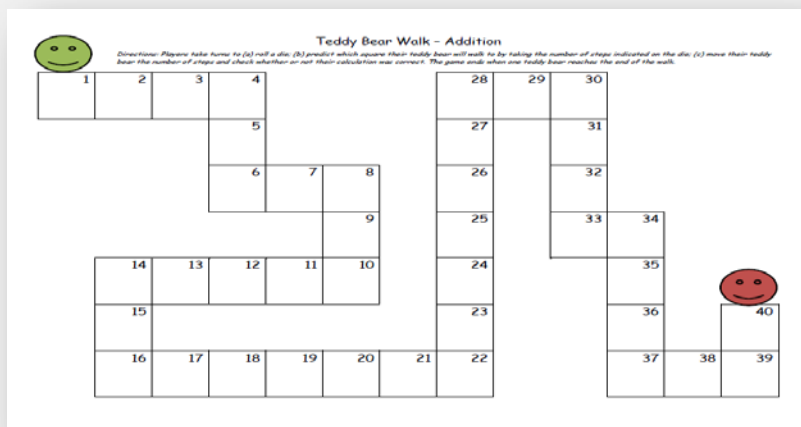
	Skill Descriptions	Aligned to CCGPS
4:10	Solving addition problems to 100 by counting on in their head	MCC.2.NBT.5

Required Resource Materials:

- Teddy Bear Walk - Addition Game Board
- A teddy bear or counter for each player
- Die or spinner with the numbers 1, 2, and 3.

Activity:

Players take turns to (a) roll a die; (b) predict which square their teddy bear will walk to by taking the number of steps indicated on the die; (c) move their teddy bear the number of steps and check whether or not their calculation was correct. The game ends when one teddy bear reaches the end of the walk.



Notes:

*Typically the die (or spinner) has the numerals 1, 2, and 3. When appropriate a die with 1 and 2 only could be used.

*If the teacher is present, observe the strategies used to solve the addition tasks.

*The board can be altered to suit the children playing.

Source: Martland, James; Stafford, Ann; Stanger, Garry; Wright, Robert; *Teaching Number in the Classroom with 4-8-year-olds*, SAGE, Los Angeles, p. 60.

Teddy Bear Walk – Addition & Subtraction - Stage Four

Skill Number: 4:10; 4:11

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:10	Solving addition problems to 100 by counting on in their head	MCC.2.NBT.5
4:11	Solving subtraction problems to 100 by counting back in their head	MCC.2.NBT.5

Required Resource Materials:

- Teddy Bear Walk – Addition & Subtraction Game Board
- A teddy bear or counter for each player
- Die or spinner with the numbers 1, 2, and 3.

Activity:

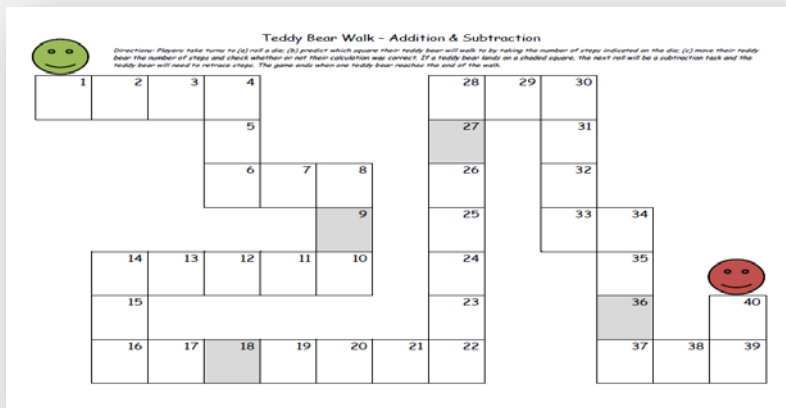
Players take turns to (a) roll a die; (b) predict which square their teddy bear will walk to by taking the number of steps indicated on the die; (c) move their teddy bear the number of steps and check whether or not their calculation was correct. The game ends when one teddy bear reaches the end of the walk.

Notes:

*Typically the die (or spinner) has the numerals 1, 2, and 3. When appropriate a die with 1 and 2 only could be used.

*If the teacher is present, observe the strategies used to solve the addition and subtraction tasks.

*The board can be altered to suit the children playing.



Source: Martland, James; Stafford, Ann; Stanger, Garry; Wright, Robert; *Teaching Number in the Classroom with 4-8-year-olds*, SAGE, Los Angeles, p. 60.

“Teen” and “Ty” Numbers - Stage Four

Skill Number: 4:8

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4.8	Recalling the facts up to 10, and the teen facts	MCC.1.OA.6

Required Resource Materials:

- Hundreds Board - Student Sheet (one for each student)
- Tens Frames
- Rekenrek
- Transparent counters

Activity:

Background:

“Teen” numbers can be very troublesome for some students because they do not realize that ‘teen’ means 10 and the usual rule of saying tens before ones is broken. For example, sixteen means literally “six and ten”, which really should be “ten and six.” Also, 11 and 12 break the “teen” pattern by not being “oneteen” and “twoteen”. Further confusion can occur for the students who fail to realize words ending in ‘ty’ are tens. In particular, many students confuse “sixty” with “sixteen”. Persistence in teaching “teen” and “ty” is needed in overcoming these problems as understanding these numbers is essential by the time part-whole thinking emerges.

“Teen” Numbers:

Seat the students in pairs. One partner shows 10 fingers. The other partner shows any number of fingers from one to nine. (for example: one partner shows 10 fingers and the other says “six”. The “ones” person says “six” and the other partner says “10”, and together they say “is sixteen”. The teacher records teen numbers as equations on the board, and has the students read them out loud. For example $10 + 6 = 16$ is on the board. The students say “Ten and six is the same as (equals) 16.”

“Teen” Numbers:

In pairs, one student points to a number between 10 and 20 on the hundreds board and the other students reads the number. Then together they show that many fingers. Repeat with the roles reversed.

“Teen” Numbers:

On the Slavonic abacus, push across 10 beads on the first row, and then push across extra beads for any amount from 11 to 19, to allow the students to practice recalling the “teen” number facts.

“Ty” Words:

Screen a Slavonic abacus from the students' view while you move complete rows of 10. Turn the abacus around and ask the students to tell you how many heads they can see. Link the number of tens to the structure of the word, for example, "eight tens is eighty" and its numeral on the hundreds board, for example, 80.

"Teen" and "Ty" Bingo

- Every student has a hundreds board and eight transparent counters. Each student places transparent counters on any eight "teen" and "ty" numbers of their choice. You show a succession of "teen" and "ty" numbers on the Slavonic abacus. If any student has a counter on the matching number, they remove that counter. The first player to remove all their counters wins.

Source URL: <http://www.nzmaths.co.nz/resource/teen-and-ty-numbers>

Teen Numbers – Stage Four

Skill Number: 4:8

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:8	Recalling the facts up to 10, and the teen facts	MCC.1.OA.6

Required Resource Materials:

- Empty Tens Frames
- Counters

Activity:

Many students fail to realize that "x-teen" in English means "x" ones and one ten. This is a serious impediment to them learning clever mental strategizing.

Ask students to place 10 counters on a frame and 7 on another frame.



Ask how many counters altogether. Watch for the students who count 10, 11, 12, 13, 14, 15, 16, 17. Such students do not understand that the seven in seventeen means seven ones and a ten.

Tell the students the code for "- teen". It is simply a crazy way to spell means ten. Invite them to show and explain how they would put out 14, 17, 19 and 18 on tens frames.

Then address the language issues of the unreliable x-teen coded numbers - fifteen meaning fiveteen, thirteen meaning threeteen. Address the language issues of the super - unreliable teen words in English. They are twelve which should be twoteen, and eleven which should be oneteen.

Source URL: <http://www.nzmaths.co.nz/resource/teen-numbers>

Teens and Fingers - Stage Four

Skill Number: 4:8

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4.8	Recalling the facts up to 10, and the teen facts	MCC.1.OA.6

Required Resource Materials:

- None

Activity:

Check students' knowledge that teen means ten so they can decode a teen word as ones plus a ten. For example, 16 means six and ten. Check that in the two teen words that do not quite fit the pattern name fifteen and thirteen that the students know "fif" means five and "thir" means three. The students need to know that the two unsystematic "teen" words twelve and eleven actually mean ten and two, and ten and one respectively.

Problem: Vincent has 14 snack packs and he eats one every day of the week for his lunch at school. How many packs does he have left at the end of the week?

Record $14 - 5$ on the board. Put the students in pairs and get them to negotiate how to show 14 fingers between them. Normally one student shows 10 as $5 + 5$ and the other shows 4. Removing 5 from 10 leaves 5. So the answer is 4 from one student and 5 from the other which together is 9. Record $14 - 5 = 9$ on the board.

Note that one of the problems below require going across a five. For example $12 - 4$ is not asked because it would require the students to use part-whole thinking by removing 2 then 2 more out of the hands showing 10. This type of problem is delayed until the part-whole sections.

Examples. Word stories and recording for: $14 - 4$, $8 + 5$, $7 + 5$, $20 - 5$, $5 + 10$, $17 - 7$, $12 - 5$

Challenging examples: Word stories and recording for $14 - ? = 9$, $8 + ? = 13$, $4 + ? = 14$, $20 - ? = 10$, $? = 4 = 14$.

Source URL: <http://www.nzmaths.co.nz/resource/teens-and-fingers>

Tens Frames - Stage Four

Skill Number: 4:3; 4:4; 4:6; 4:8

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:3	Numeral recognition 0-100	MCC.1.NBT.1
4:4	Number order: What comes before and after a given number in the range 0-100	MCC.K.CC.2
4:6	Comparing two numbers in the range 0-100 using number cards	MCC.1.NBT.3
4.8	Recalling the facts up to 10, and the teen facts	MCC.1.OA.6

Required Resource Materials:

- Tens Frames (for numbers 0-10) (*You will need 10 tens frames with all 10 dots*)

Activity:

Show a numeral card and tell the students to show the matching tens frame (use ten 10 frames with all 10 dots to represent 100). Then have them say and show the number that comes before and the number that comes after.

The students can be seated in pairs, one behind the other. Show a tens frame to one member of each pair. The student draws the pattern as dots with gentle taps on their partner's back. The partner then writes the matching number in the air with their finger then mimics the dot pattern in the air as well.

Show student two different numbers with the tens frames and have him compare the two. Ask which number has the most dots and which has the least dots. Interchange "most dots" to the word "greatest" and "least dots" to the word "least".

Extension Activity:

When the students are familiar with the tens frames, ask them to identify the number of spaces on the cards as well as the number of dots. In each case, "dots" plus "spaces" equals 10. For example, seven dots plus three spaces makes 10. Record these results using numeral cards or by writing equations like $7 + 3 = 10$ on the board.

Source URL: <http://nzmaths.co.nz/resource/tens-frames>

Tens Frames Teen Numbers – Stage Four

Skill Number: 4:8

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioral Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:8	Recalling the facts up to 10, and the teen facts	MCC.1.OA.6

Required Resource Materials:

- Empty Tens Frames
- Counters

Activity:

Teacher holds up a full tens frame and asks, "How many do I have?"

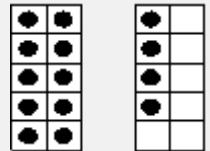
Teacher holds up another card, alongside the full tens frame, and asks "How many do I have now?"

Repeat several times ensuring that the numbers 11 - 20 have been covered.

Teacher repeats above but this time shows the students the full tens frame has been turned over so the dots are not visible.

Teacher models 11 on the tens frame and says; "Let's look at the number 11. How would we write that?"

Records: $10 + 1 = 11$. Continue in like manner for $10 + 2 = 12$, $10 + 3 = 13$ and so on. Teacher asks students to solve problems such as $10 + 4$, $10 + 9$ with a focus on quick recall.



Extension Activities

Teacher models one of the teen numbers on a tens frame. Students record the written form "15" while one student uses the expanded numeral cards to record the number. Once the recording is finished teacher asks:

What does the 1 mean? [1 group of ten]

What does the 5 mean? [5 ones]

Teacher adds further blank tens frames to the model, for example 21: two tens and a 1.

*Note: the context of a train with one full carriage and one partly full carriage can be used in this teaching sequence.

Source URL: <http://www.nzmaths.co.nz/resource/using-tens-frames-teen-numbers>

Tens in Tens - Stage Four

Skill Number: 4:9

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:9	Recalling the number of 10s within decades that add to 100	MCC.1.NBT.4

Required Resource Materials:

- 10 dimes
- Piece of paper

Activity:

What to do:

Show student seven dimes. Explain that a dime is worth ten cents. Count together to find that the 7 dimes is 70 cents ("10, 20, 30, 40, 50, 60, 70"). Write down the number 70. Ask student; "How many tens are in 70?" Have the student count the number of coins to answer the question. Continue for 10, 20, 30, 40, 50, 60, 80, 90, and 100.

When the student can do these easily, without counting the number of coins, write the number 70 and ask how many tens are in 80? Do the same for 10, 20, 30, 40, 50, 60, 80, 90, and 100.

Students will begin by counting the number of coins to find how many tens are in a decade number. Expect over time that they will see the answer from the written number.

Variation:

As an extension write other numbers, for example 43, and ask how many tens are in 43.

Source URL: <http://www.nzmaths.co.nz/content/tens-tens>

Tick Tock - Stage Four

Skill Number: 4:1

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

<i>Stage</i>	<i>Behavioural Indicator</i>
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:1	Rote counting 0-100	<i>MCC.K.CC.1</i>

Required Resource Materials:

- Weighted object on the end of a piece of string

Activity:

Have the student choose one of the following exercises: taking giant steps, taking baby steps, jumping in place, jumping jacks, or toe touches. Using the weighted object on the string (a pendulum) swing it to a specific number between 1 and 100. The student would count aloud for each swing. Then the student would do the chosen exercise for that same number while counting aloud. You can change the manner in which the swings are counted by using 'big' swings to represent '10' and 'little' swings to represent '1'. Have student do the same exercise (or a different) exercise starting on the specified number and counting backwards to 1.

Source URL: <http://nzmaths.co.nz>

Wafers – Stage Four

Skill Number: 4:16

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Description	Aligned to CCGPS
4:16	Finding simple fractions of regions	<i>MCC.1.G.3</i> <i>MCC.2.G.3</i> <i>MCC.3.G.3</i>

Required Resource Materials:

- Wafer cookies (rectangles made from grid paper can be used)

Activity:

Background

The students must realize that the symbols for fractions tell how many parts the whole has been divided into (the bottom number or denominator) and how many of those parts have been chosen (the top number or numerator). For example, $\frac{2}{3}$ shows that one (a whole) is divided into three equal parts (thirds) and that two of those parts are chosen. Note that the terminology is not as significant as the idea, although the students will acquire the correct terms if they are used consistently.

Students also need to appreciate that the most common context for fractions is division where the numbers do not divide evenly. For example, when four people share 14 things, each person will get three things but two things will remain to be shared. These two things must be divided into halves to make the equal sharing possible.

The English language presents a barrier to the students generalizing the meaning of fractions. Halves, thirds, and quarters (fourths) are special words, and it is not until fifths (five-ths), sixths, sevenths, etc. are encountered that the "ths" code becomes evident.

Using Materials

Problem: "I want you to work in pairs. You will get three wafer cookies. Think about how you might share the wafers so that each person gets half of the wafers."

Tell the students to discuss how they will cut up the wafers so that they can be shared equally. Some students will suggest cutting each wafer in half, but others will suggest giving each person a wafer and halving the remaining one. Discuss how these methods compare, that is, three halves make one and one-half wafers.

Ask, "How can we check that each person will get the same number of wafers?"

The wafers can be cut and each person's share of wafers put end on end. Ask the students how many wafers each person is getting.

Develop vocabulary like "one and one-half" and "three halves". Use symbols to record their findings:

Generalize the ideas further with similar problems, like:

"This time you will be in groups of four, but I will still give you three wafers. Find a way to share the wafers equally. How much wafer will each person get?"

Ask the students to predict how much they will get.

"It will be less than a whole wafer because four people would need four wafers for that."

"We cut each wafer into four pieces. Each person gets three pieces. What are the pieces called?" (quarters)

Provide other examples for exploration with the materials, such as:

Three people share four wafers. Four people share six wafers.

Using Imaging

Third Person: Pose this problem: "Suppose there were three people, and they had to share two wafers. How much would each person get? I want you to think about that and draw a picture to show your ideas."

Discuss the diagrams the students draw using the language of fractions.

"You have cut each wafer into three pieces. What could you call each piece?" (one third)

"How many of those pieces will each person get?"

If the students do not have the language of thirds, tell them about it.

For example, "One-third and another one-third is called two-thirds."

Record the students' findings using symbols.

For example, $1/3 + 1/3 = 2/3$.

Pose other similar problems to see if the students can image a way to anticipate the sharing of cookies.

"There are five people at the party and six wafers. How much wafer will each person get?"

Using Number Properties

The students have a good understanding of equal sharing when they can anticipate the result using the properties of the numbers involved rather than relying on images. The number size is increased to promote generalization.

"Suppose I put you in groups of six people. Each group would get four cookies. How much cookie would each person get?"

Look for responses like:

"They will get more than one-half but less than one."

"How do you know?"

"It takes three cookies to give each person one-half, but to give them each one whole cookie would take six."

"That would be the same as three people sharing two cookies."

Source URL: <http://www.nzmaths.co.nz/resource/wafers>

What's Hidden? – Stage Four

Skill Number: 4:8

Teacher Learning and Understanding: **STAGE FOUR**

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Description	Aligned to CCGPS
4:8	Recalling the facts up to 10, and the teen facts	<i>MCC.1.OA.6</i>

Required Resource Materials:

- Plastic teddies or counters (for this particular activity the number range is 0-10)
- Containers

Activity:

State the following problem:

"Here are 6 teddies and hidden under the container there are some more. Altogether there are 9 teddies. How many teddies are hidden?"

Record $6 + ? = 9$. The students solve the problem by imagining the numbers. Fold back if needed to Using materials by showing what is hidden.

Continue with several more problems. Then put students in pairs. One student hides some teddies and the other solves the problem. Then reverse roles.

Source URL: <http://www.nzmaths.co.nz/resource/whats-hidden>

Who is the Richest? - Stage Four

Skill Number: 4:5

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
4:5	Ordering the numbers in the range 0-100	MCC.1.NBT.3

Required Resource Materials:

- Play money (up to 100 one dollar bills per student or a combination of ones, fives, and tens for students able to count money using different denominations)

Activity:

Give each student in the group an amount of money in the number range of 1-100. Have each child count their money and state the amount that they have. Record the amounts in a table (see below). Then ask the question: "Who is the richest?" The students compare their money to the amounts the other students have and as a group the students declare the richest among them. Then, using the information recorded in the table, assist the students in ordering the amounts from least to greatest and from greatest to least. Continue in like manner until each student has been the "richest" at least once.

Example of table:

Name	Amount
Emily	\$84
Phil	\$69
Bryan	\$72

Source URL: <http://www.nzmaths.co.nz/resource/who-richest>

Zap - Stage Four

Skill Number: 4:9

Teacher Learning and Understanding: STAGE FOUR

Students working on this activity are Stage Three working towards Stage Four.

Stage	Behavioural Indicator
3	Counting from One by Imaging The student's most advanced strategy is counting from one without the use of materials to solve addition and multiplication problems.
4	Advanced Counting The student's the most advanced strategy is counting-on, or counting-back to solve addition or subtraction tasks, skip counting to solve multiplication tasks, and equal sharing by ones or repeated skip counting to solve division and fraction problems.

Skill Descriptions Aligned to CCGPS:

	Skill Description	Aligned to CCGPS
4:9	Recalling the number of 10s within decades that add to 100	<i>MCC.1.NBT.4</i>

Required Resource Materials:

- Arrow Cards to 9000 (students will only use cards up to 100)
- Calculators

Activity:

The students work in pairs. One student begins by putting a number into the calculator, for example, 67. Then an instruction is given. "Zap out the 6 in 67". Here 67 - 60 "zaps" the 6. The students "zap" by using numbers and the +, -, x, or ÷ buttons. The students should also demonstrate the process that the numbers go through with Arrow Cards. For example, 67 on Arrow Cards becomes 7 by removing the card that shows 60.

Repeat for:

Zap 45 to 75	Zap 56 to 50	Zap 40 to 100	Zap 56 to 23	Zap 100 to 20	Zap 80 to 20	Zap 75 to 25
Zap 40 to 80	Zap 48 to 24	Zap 82 to 2	Zap 7 to 97	Zap 43 to 40	Zap 38 to 58	Zap 100 to 30

Make up new problems to "zap"

Source URL: <http://www.nzmaths.co.nz/resource/zap>