

NZ
Numeracy
Project

Activities

Stage

Three

Adding and Subtracting with Counters – Stage Three

Skill Number: 3:9; 3:10

Teacher Learning and Understanding: STAGE THREE

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:9	Recalling facts within 5, and doubles to 10	MCC.K.OA.5; MCC.1.OA.6
3:10	Solving addition problems to 20 by counting all the objects in their head	MCC.1.OA.6

Required Resource Materials:

- Counters

Activity:

Addition Problem to 5 (groupings within 5 and addition facts to 5):

State the following problem:

"Gary has 2 drinks in the cupboard and he buys 3 more drinks for his birthday party. How many drinks does Gary have now?"

Record $2 + 3$ on the board. The students use counters to solve the problem.

Record $2 + 3 = 5$ on the board.

Continue with word problem stories and recordings for: $0 + 5$, $1 + 4$, $3 + 2$, $4 + 1$, $5 + 0$

Subtraction Problem from 5 (subtraction facts from 5):

State the following problem:

"Susan has 5 marbles. She gives her sister 3 marbles. How many marbles does she have left?"

Record $5 - 3$ on the board. The students use counters to solve the problem.

Record $5 - 3 = 2$ on the board.

Continue with word problem stories and recordings for: $5 - 0$, $5 - 1$, $5 - 2$, $5 - 4$, $5 - 5$

Addition Problem with 5 (groupings with 5):

State the following problem

"Lou has 5 pictures. His mother gives him 3 more pictures. How many pictures does Lou have now?"

Record $5 + 3$ on the board. The students use counters to solve the problem.

Record $5 + 3 = 8$ on the board.

Continue with word problem stories and recordings for: $5 + 0$, $5 + 1$, $5 + 2$, $5 + 4$, $5 + 5$

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 use counters to solve the problem.

Record $4 + 6 = 10$ on the board.

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 use counters to solve the problem.

Record $3 + 3 = 6$ on the board.

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

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 use counters to solve the problem.

Record $15 + 5 = 20$ on the board.

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 use counters to solve the problem.

Record $20 - 6 = 14$ on the board.

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

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

Adding and Subtracting with One Hand – Stage Three

Skill Number: 3:8; 3:9

Teacher Learning and Understanding: STAGE THREE

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:8	Instantly recognizing patterns to 10, including doubles	<i>MCC.K.OA.1</i>
3:9	Recalling facts within 5, and doubles to 10	<i>MCC.K.OA.5; MCC.1.OA.6</i>

Required Resource Materials:

- None

Activity:

Adding on One Hand:

State the following problem:

"Jill has 3 apples and she buys 2 more apples. How many apples does she have altogether?"

Record $3 + 2$ on the board. Have student model 3 fingers then 2 more fingers **on the same hand**. Be sure the student recognizes that 3 fingers and 2 fingers equal 5 **without counting** to solve the problem.

Record $3 + 2 = 5$ on the board. Have student record $3 + 2 = 5$ on paper.

Continue with word problem stories and recordings for: $5 + 0, 4 + 1, 2 + 3, 1 + 4, 0 + 5, 4 + 0, 3 + 1, 2 + 2, 1 + 3, 0 + 4, 3 + 0, 2 + 1, 1 + 2, 0 + 3, 2 + 0, 1 + 1, 0 + 2, 1 + 0, 0 + 1$

Subtracting on One Hand:

State the following problem:

"Norman had 5 cars. He sold 2 of his cars. How many cars does he have now?"

Record $5 - 2$ on the board. Have student model 5 fingers then taking away 2 fingers **on the same hand**. Be sure the student recognizes that 5 fingers minus 2 fingers equal 3 **without counting** to solve the problem.

Record $5 - 2 = 3$ on the board. Have student record $5 - 2 = 3$ on paper.

Continue with word problem stories and recordings for: $5 - 0, 5 - 1, 5 - 3, 5 - 4, 5 - 5, 4 - 0, 4 - 1, 4 - 2, 4 - 3, 4 - 4, 3 - 0, 3 - 1, 3 - 2, 3 - 3, 2 - 0, 2 - 1, 2 - 2, 1 - 0, 1 - 1$

Adding on One Hand to Find the Missing Number:

State the following problem:

"When Paula goes to sleep she has 3 baby dolls in her bedroom. While she is asleep her mother gives her more baby dolls. She wakes up in the morning to find she has 5 baby dolls. How many baby dolls did her mother give her?"

Discuss and record $3 + ? = 5$ on the board. Have student "act out" the problem using materials (blocks, dolls, etc.). Then have the student create a finger pattern for the problem. Explain how to find the missing number by showing 3 fingers and then 5 fingers (**using the same hand**). Have student recognize that 2 fingers were added to 3 fingers to make 5.

Record $3 + 2$ on the board. Have student model 3 fingers then 2 more fingers **on the same hand**. Be sure the student recognizes that 3 fingers and 2 fingers equal 5 **without counting** to solve the problem.

Record $3 + 2 = 5$ on the board. Have student record $3 + 2 = 5$ on paper.

Continue with word problem stories and recordings for: $1 + ? = 5$, $4 + ? = 5$, $2 + ? = 5$, $5 + ? = 5$, $1 + ? = 4$, $3 + ? = 4$, $2 + ? = 4$, $4 + ? = 4$, $0 + ? = 4$, $1 + ? = 3$, $2 + ? = 3$, $3 + ? = 3$, $0 + ? = 3$, $1 + ? = 2$, $0 + ? = 2$, $2 + ? = 2$, $1 + ? = 1$, $0 + ? = 1$

Subtracting on One Hand to Find the Missing Number:

State the following problem:

"Mrs. Thomas has 5 marshmallows in a jar in her kitchen. She leaves to go shopping. When she comes home her son Bryce has eaten some of them and there are 2 marshmallows left. How many marshmallows did Bryce eat?"

Discuss and record $5 - ? = 2$ on the board. Have student "act out" the problem using materials (blocks, marshmallows, etc.). Then have the student create a finger pattern for the problem. Explain how to find the missing number by showing 5 fingers and then 2 fingers (**using the same hand**). Have student recognize that 3 fingers were taken away from 5 to make 2 **without counting** to solve the problem.

Record $5 - 3 = 2$ on the board. Have student record $5 - 3 = 2$ on paper.

Continue with word problem stories and recordings for: $5 - ? = 4$, $5 - ? = 3$, $5 - ? = 2$, $5 - ? = 1$, $5 - ? = 0$, $5 - ? = 5$, $4 - ? = 3$, $4 - ? = 2$, $4 - ? = 1$, $4 - ? = 0$, $4 - ? = 4$, $3 - ? = 2$, $3 - ? = 1$, $3 - ? = 0$, $3 - ? = 3$, $2 - ? = 1$, $2 - ? = 0$, $2 - ? = 2$, $1 - ? = 0$, $1 - ? = 1$

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

Arrow Cards – Stage Three

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

Teacher Learning and Understanding: STAGE THREE

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:1	Rote counting 0-50	MCC.K.CC.1
3:2	Saying the forwards and backwards number word sequence in the range 0-50, starting and ending with any number	MCC.K.CC.3
3:3	Numeral recognition 0-50	MCC.1.NBT.1

Required Resource Materials:

- Arrow Cards 1-100 (*you will only need the Arrow Cards up to the number 50 for this activity*)

Activity:

Give student a set of arrow cards 1-100. Have him make the number 32 by overlapping the arrow cards of '30' and '2'. Be sure the student knows that the points of both cards must be lined up. Have student state "30 and 2 make 32."

Call out the following set of numbers (one at a time): 27, 50, 49, 14, 8, 32

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, 12, 23, 45, 9, 50
- 11, 6, 27, 50, 33, 44
- 50, 26, 5, 19, 34, 47
- 46, 50, 9, 31, 13, 28

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

Bead Strings – Stage Three

Skill Number: 3:2; 3:4; 3:5; 3:6

Teacher Learning and Understanding: STAGE THREE

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:2	Saying the forwards and backwards number word sequence in the range 0-50, starting and ending with any number	<i>MCC.K.CC.3</i>
3:4	Number order: What comes before and after a given number in the range 0-50	<i>MCC.K.CC.2</i>
3:5	Ordering the numbers in the range 0-50	<i>MCC.K.CC.2</i>
3:6	Counting up to 50 objects by grouping the objects in tens	<i>MCC.1.NBT.2</i>

Required Resource Materials:

- Bead strings with 50 beads in groups of five
- Twisty ties (from bread wrappers)

Activity:

Show the student a bead string (with 50 beads). Use twisty ties to label the beginning and end of the string as 0 and 50. Ask the students to use grouping strategies to locate the multiples of 10 on the string.

Now state other numbers in the range 0-50 and have the students find efficient ways to locate the numbers. Encourage grouping strategies. For example, 25 is found by identifying the position half way between 0 and 50. 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 50 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>

Birthday Cakes – Stage Three

Skill Number: 3:3

Teacher Learning and Understanding: **STAGE THREE**

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:3	Numeral recognition 0-50	<i>MCC.1.NBT.1</i>

Required Resource Materials:

- Toothpicks
- Numeral Cards 0-50
- Birthday Cake Sheet

Activity:

In pairs, the students select cards for the age of a person having a party (between the ages of 1-50) and match this with "candles" (toothpicks) on the birthday cake. Repeat this except ask questions like 'How many more candles will be needed in 2 years' time?' and "How many more candles will be needed when the person goes from 32 to 41 years of age?"

Source URL: <http://www.nzmaths.co.nz/resource/birthday-cakes-0>

Both Hands – Stage Three

Skill Number: 3:8; 3:10; 3:11

Teacher Learning and Understanding: STAGE THREE

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:8	Instantly recognizing patterns to 10, including doubles	MCC.K.OA.1
3:10	Solving addition problems to 20 by counting all the objects in their head	MCC.1.OA.6
3:11	Solving subtraction problems from 20 by counting all the objects in their head	MCC.1.OA.6

Required Resource Materials:

- None

Activity:

Addition Using Imaging (*shielding*):

State the following problem:

"Margaret has 5 stickers on her school bag and she adds 3 more. How many stickers does she have now?"

Record $5 + 3 = ?$ on the board. Have the student put both hands behind his/her back to imagine the answer. *If the student is unable to solve the problem using imaging, review the 'Both Hands' activity from stage One where the student uses materials (fingers) to solve problems.*

Record $5 + 3 = 8$ on the board. Have student record $5 + 3 = 8$ on paper.

Continue with word problem stories and recording for: $1 + 6$, $3 + 4$, $6 + 2$, $5 + 2$, $7 + 1$, $2 + 8$, $4 + 6$, $3 + 3$, etc.

Subtraction Using Imaging (*shielding*):

State the following problem:

"Rebekah bought 10 pencils. She gave some of her pencils to friends. She now has 3 pencils. How many pencils did she give away?"

Record $10 - ? = 3$ on the board. Have the student put both hands behind his/her back to imagine and give the answer.

Record $10 - 7 = 3$ on the board. Have student record $10 - 7 = 3$ on paper.

Continue with word problem stories and recording for: $9 - ? = 2$, $7 - ? = 4$, $6 - ? = 5$, $8 - ? = 4$, $10 - ? = 6$, $6 - ? = 3$, $9 - ? = 9$, $6 - ? = 1$, etc.

Addition and Subtraction Using Imaging Only:

State the following problem:

"What is the missing number: $9 - ? = 4$ "

Record $9 - ? = 4$ on the board. Have the student imaging the solution without using fingers behind his/her back.

Record $9 - 5 = 4$ on the board. Have student record $9 - 5 = 4$ on paper.

Continue with additional problems for $6 - ? = 5$, $9 - ? = 4$, $1 + ? = 6$, $5 + ? = 7$, $7 + ? = 10$, etc.

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

Bowl a Fact – Stage Three

Skill Number: 3.10, 3.11

Teacher Learning and Understanding: STAGE THREE

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:10	Solving addition problems to 20 by counting all the objects in their head	MCC.1.OA.6
3:11	Solving subtraction problems from 20 by counting all the objects in their head	MCC.1.OA.6

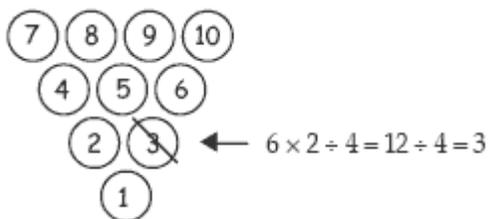
Required Resource Materials:

- 3 dice
- Whiteboard and whiteboard markers

Activity:

Each player draws the 10-pin bowling triangle with the numbers 1 to 10 inside each circle. They take turns to roll three dice and record the numbers that come up. The students use the three numbers once only and combine them using addition and/or subtraction, and brackets if needed, to make up a number sentence that "bowls out" numbers in the triangle. (You could also use only 2 dice to simplify this activity.)

For example, 8 might be bowled out with $6 + 4 - 2$. The students try to "bowl out" as many numbers as possible with each turn, but need to wait for their next turn to have another throw when they are stuck. For the students at the early strategy stages, the focus should be on addition and subtraction, but the activity can be extended for more able students. (Example of using all four operations shown below.)



Source URL: <http://www.nzmaths.co.nz/resource/bowl-fact>

Card Ordering – Stage Three

Skill Number: 3:5

Teacher Learning and Understanding: **STAGE THREE**

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

<i>Stage</i>	<i>Behavioural Indicator</i>
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:5	Ordering the numbers in the range 0-50	<i>MCC.K.CC.2</i>

Required Resource Materials:

- Four sets of number cards 1-50.

Activity:

The object of the game is to play the cards in order and be the student to play the cards that has 50 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 50. 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 50 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 50 have been completed.

Note: If four stacks to fifty are too much, lower then amount of stacks to 3, 2, or 1.

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

Caterpillar Legs – Stage Three

Skill Number: 3:3; 3:5

Teacher Learning and Understanding: STAGE THREE

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

<i>Stage</i>	<i>Behavioural Indicator</i>
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:3	Numeral recognition 0-50	<i>MCC.1.NBT.1</i>
3:5	Ordering the numbers in the range 0-50	<i>MCC.K.CC.2</i>

Required Resource Materials:

- Toothpicks
- Numeral Cards 0-50
- Caterpillar Legs Sheet

Activity:

Place a blank caterpillar in front of the student. Explain that a numeral card (between 1 and 50) will be placed on the caterpillar and that he/she will use toothpicks to put that number of legs on the caterpillar. Continue the activity by placing new blank caterpillars in front of the student with different numbers and having him/her add the correct number of legs for each. When several are complete, have the student order the caterpillars from the smallest number of legs to the largest.

Source URL: <http://nzmaths.co.nz/resource/caterpillar-legs>

Clapping – Stage Three

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

Teacher Learning and Understanding: **STAGE THREE**

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

<i>Stage</i>	<i>Behavioural Indicator</i>
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:1	Rote counting 0-50	<i>MCC.K.CC.1</i>
3:2	Saying the forwards and backwards number word sequence in the range 0-50, starting and ending with any number	<i>MCC.K.CC.3</i>
3:4	Number order: What comes before and after a given number in the range 0-50	<i>MCC.K.CC.2</i>

Required Resource Materials:

- None

Activity:

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

- Counts from 0 to 50
- Counts from a number other than 1 and stops at a specific number (between 1 and 50)
- Counts backwards from 50 to 0
- Counts backwards to a different number (other than 50) and stop at a specific number (between 0 and 50)

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

- Counts from 0 to 50
- Counts from a number other than 1 and stops at a specific number (between 0 and 50)
- Counts backwards from 50 to 0
- Counts backwards to a different number (other than 50) and stop at a specific number (between 0 and 50)

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

- Counts from 0 to 50
- Counts from a number other than 1 and stops at a specific number (between 0 and 50)
- Counts backwards from 50 to 0
- Counts backwards to a different number (other than 50) and stop at a specific number (between 0 and 50)

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

Comparisons with Number Cards – Stage Three

Skill Number: 3:7

Teacher Learning and Understanding: **STAGE THREE**

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

<i>Stage</i>	<i>Behavioural Indicator</i>
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:7	Comparing two numbers in the range 0-50 using number cards	<i>MCC.1.NBT.3</i>

Required Resource Materials:

- Number Cards (one set of cards 1-50 for each student)

Activity:

Give each student a set of number cards (1-50) 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 36 is greater than the number 27*" or "*The number 39 is less than the number 41.*"

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.

Compatible Numbers to Ten – Stage Three

Skill Number: 3:8

Teacher Learning and Understanding: **STAGE THREE**

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

<i>Stage</i>	<i>Behavioural Indicator</i>
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:8	Instantly recognizing patterns to 10, including doubles	<i>MCC.K.OA.1</i>

Required Resource Materials:

- Compatible Numbers to Ten Sheet (with exercises and answers)

Activity:

Prior Knowledge:

Use count on strategies
Use their "10 and" facts

Background:

Knowing the basic facts to 10, including the compatible numbers, is essential knowledge if students are to advance to becoming part-whole thinkers. For older students, one way to provide practice and reinforcement of these skills is for the students to play math games with two dice. (One at least of these should have a number rather than dots). Another way to prepare students for the part-whole leap is to develop their understanding around their facts to 10, so while these exercises are based around compatible numbers to ten, they include a number of other issues that are significant to the learning of students at this stage. This can introduce a level of challenge even for students who initially seem to know their compatible numbers to 10. Important learning is outlined below.

Use of the equals sign:

There are a lot of misconceptions around the use of the equals sign. Some students seem to think that it means "work out the answer". Consequently, no equals signs have been provided in exercises where simple additions are required. Students with such an understanding may also think that $4 + 6 = 10$ is a correct way to write the sentence, but not $10 = 4 + 6$ (Hence number 25 in exercise 1). Such a question may be posed as part of the practice, then discussed at a later teaching session or could be included as part of a lesson.

The second part of exercise 1 is provided to reinforce the use of the equals sign when two things are identical/equal, and that the things on the left and right balance. This meaning of equals should also be

raised as part of the teaching around this topic.

Inequalities:

It has been noted that in recent years there has not been the same emphasis on developing an understanding of inequalities in primary mathematics. This is not intended, but may mean that some students come through without the understandings they have had in the past. Consequently some teaching may need to be provided before students understand the sign and the concepts required by this exercise.

Start, Change, Result Unknown:

Students don't really know a fact until they can recognize and use it in all three formats. Exercise 3 not only provides practice in recognizing the facts in these other formats, but also introduces students to lower level algebra. Mental computation (or recall of known facts) of such simple equations is most sensible method of solution.

Use of shapes as unknowns:

Students should have been working with shapes as unknowns for quite some time before reaching secondary school, so should be conversant with what is expected in using a shape in a sentence/equation. In this example, however, the meaning of the unknown has changed. Firstly, there are two different shapes - which traditionally would mean that they represent different numbers (though there is the special case where they are the same). Students may need to discuss this before attempting the problem). However, the unknowns do not represent a single number in this context. This too may need to be introduced - that there could be lots of possibilities for such an equation (though is likely to arise naturally if you ask them all to think of two numbers that add up to 10.

The link between addition and subtraction:

A single addition fact should be able to be turned into related subtraction facts and simple subtractions should be able to be solved using knowledge of basic addition facts. However, for many students, subtraction understanding lags behind addition understanding. Making the link between addition and subtraction is thus essential teaching at this level.

Word problems:

One issue with providing words problems in an exercise alongside simple number problems is that some students learn not to read the words, and simply to pull out the numbers "and do the same to them." To address this problem, this exercise includes a variety of formats of problem. In fact, number one requires a subtraction with the numbers 6 and 4 - rather than an addition, while others include change unknown format - so could equally be an addition or a subtraction that relies on their compatible number knowledge. This exercise provides a good basis for a teaching session around "what words tell us that we should be adding the numbers ..." In this teaching session, students could be encouraged to develop a list of words commonly used to indicate that the operations of addition and subtraction are to be used.

Discovery based on patterning:

Students learn a lot of mathematics (things that are not necessarily directly taught - or intended to be taught) by identifying patterns. Often, the better we are at identifying patterns, the better we are at mathematics. These exercises look to harness patterning to help students realize that knowing these facts to 10 mean that they can also answer a whole load of other problems. Both exercises require

follow-up discussion - and additional practice built around consolidating these discoveries. For example, students could make a poster showing how to use their facts to 10 to answer other problems. They should also do some practice working in using this new skill - all three formats, start, change and result unknown.

Comments on the Exercises:

Exercise 1

Asks students to identify equations that sum to 10.

Exercise 2:

Asks students to identify if single digit additions are $<$, $>$, or $=$ to 10.

Exercise 3:

Asks students to complete compatible number equations.

Exercise 4:

Asks students to identify compatible numbers to 10.

Exercise 5:

Asks students to identify compatible numbers in subtraction equations.

Exercise 6:

Asks students to use compatible number to solve addition problems, e.g., $7 + 9 + 3 =$

Exercise 7:

Asks students to use compatible numbers to solve word problems.

Exercises 8 and 9:

Asks students to use compatible numbers to 10 with two-digit numbers, e.g.
 $47 + 3 = 50$, $10 + 90 = 100$

Exercise 10:

Extension problems.

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

Counters in a Row – Stage Three

Skill Number: 3:10

Teacher Learning and Understanding: **STAGE THREE**

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

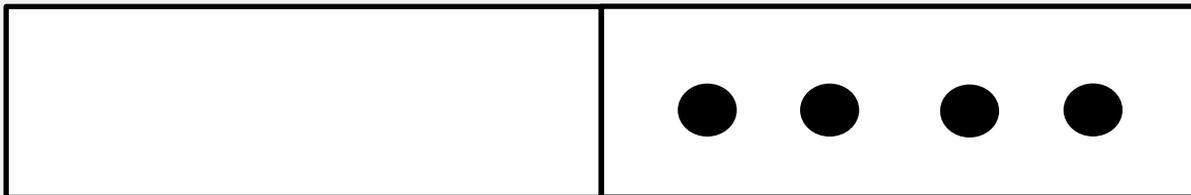
	Skill Descriptions	Aligned to CCGPS
3:10	Solving addition problems to 20 by counting all the objects in their head	MCC.1.OA.6

Required Resource Materials:

- Overhead projector
- Overhead projector counters
- Strip of card
- Individual whiteboards and marker pens

Activity:

An overhead projector and opaque counters or translucent counters (preferably the same color) are used. The teacher counts out the counters laying them in a line. Children are asked to check the number of counters in the line (counting with the teacher if necessary). The teacher uses a strip of card to screen the collection, then counts out three more counters continuing the line. The teacher poses the question; *"There are eight counters under the card and we have three more counters. How many counters are there altogether?"* The children write their answers on their whiteboards (or on scrap paper). The teacher asks the children for their answers and are asked to come to the front and explain their answers. The teacher then uses the collections of counters on the screen to talk the children through the calculation, demonstrating counting-on from the number of screened counters.



Notes:

- The numbers chosen for this activity should take account of children's facility with the forward number word sequence (FNWS).
- The range of numbers used can be varied
- The activity is suitable for whole class, small group or individuals
- This activity can help children learn to count on.

Source: Martland, James; Stafford, Ann; Stanger, Garry; Wright, Robert; *Teaching Number in the Classroom with 4-8-year-olds*, SAGE, Los Angeles, p. 57.

Counting – Stage Three

Skill Number: 3:1; 3:2

Teacher Learning and Understanding: STAGE THREE

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:1	Rote counting 0-50	MCC.K.CC.1
3:2	Saying the forwards and backwards number word sequence in the range 0-50, starting and ending with any number	MCC.K.CC.3

Required Resource Materials:

- Large Hundreds Board (preferably one that is laminated and can be written on with dry erase marker)
- Rekenrek with at least 50 beads (one for each student)

Activity:

With Hundreds Board

Have students clap as they count in ones to 50. 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 Three

Skill Number: 3:1; 3:2

Teacher Learning and Understanding: STAGE THREE

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:1	Rote counting 0-50	MCC.K.CC.1
3:2	Saying the forwards and backwards number word sequence in the range 0-50, starting and ending with any number	MCC.K.CC.3

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 50.

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 50). 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>

Crossing the Five Barrier – Stage Three

Skill Number: 3:10; 3:11

Teacher Learning and Understanding: STAGE THREE

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:10	Solving addition problems to 20 by counting all the objects in their head	<i>MCC.1.OA.6</i>
3:11	Solving subtraction problems from 20 by counting all the objects in their head	<i>MCC.1.OA.6</i>

Required Resource Materials:

- Counters
- Blank card
- Tens Frames

Activity:

Using Materials:

Problem: Work out $3 + 4$. Record $3 + 4$ on the board. Show a tens frame pre-printed with 3 dots. Ask the students to point where 4 more counters would go and work out $3 + 4$. Check by adding 4 counters. Record the answer.

Examples: Word stories and recording for: $3 + 3$, $6 + 3$, $2 + ? = 6$, $6 - ? = 2$, $6 - 4$, $4 + 4$, $8 - ? = 4$

Using Imaging Shielding:

Problem: Find $7 - ? = 4$.

Record $7 - ? = 4$ on the board. Hide a pre-printed tens frame showing 7 dots and ask the students to picture what you can see. Then picture removing 3 dots. Let them draw in the air if this helps. Fold back if necessary by showing 7 dots and shielding 3 of the dots. Record the answer.

Examples: Word stories and recording for: $3 = 3$, $6 + 3$, $2 + ? = 6$, $6 - ? = 2$, $6 - 4$, $4 + 4$, $8 - ? = 4$

Imaging Only:

Examples: Word stories and recording for: $2 + ? = 6$, $8 - ? = 4$...

Challenging Examples:

Problem: Angus has some money. He spends \$4.00. Now he has \$3.00. How much did he start with?

Examples: Word stories and recording for: $? - 3 = 3$, $? - 4 = 3$, $? - 3 = 6$, $? - 2 = 8$...

Source URL: <http://www.nzmaths.co.nz/resource/crossing-five-barrier>

Imaging Many Hands – Stage Three

Skill Number: 3:9, 3:10, 3:11

Teacher Learning and Understanding: **STAGE THREE**

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:9	Recalling facts within 5, and doubles to 10	<i>MCC.K.OA.5</i> <i>MCC.1.OA.6</i>
3:10	Solving addition problems to 20 by counting all the objects in their head	<i>MCC.1.OA.6</i>
3:11	Solving subtraction problems from 20 by counting all the objects in their head	<i>MCC.1.OA.6</i>

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 Three

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

Teacher Learning and Understanding: STAGE THREE

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:1	Rote counting 0-50	<i>MCC.K.CC.1</i>
3:2	Saying the forwards and backwards number word sequence in the range 0-50, starting and ending with any number	<i>MCC.K.CC.3</i>
3:3	Numerical recognition 0-50	<i>MCC.1.NBT.1</i>
3:4	Number order: What comes before and after a given number in the range 0-50	<i>MCC.K.CC.2</i>

Required Resource Materials:

- Number Cards 1-50

Activity:

Have the student sit directly in front of you with his back to you. Give student the number cards 1-50. 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.

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

Lily Pads – Stage Three

Skill Number: 3:3; 3:4

Teacher Learning and Understanding: **STAGE THREE**

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:3	Numeral recognition 0-50	<i>MCC.1.NBT.1</i>
3:4	Number order: What comes before and after a given number in the range 0-50	<i>MCC.K.CC.2</i>

Required Resource Materials:

- Large Number Cards 0-50 (*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 0-50 on the floor 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 0-50.

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

Loud and Soft – Stage Three

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

Teacher Learning and Understanding: STAGE THREE

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

<i>Stage</i>	<i>Behavioural Indicator</i>
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:1	Rote counting 0-50	<i>MCC.K.CC.1</i>
3:2	Saying the forwards and backwards number word sequence in the range 0-50, starting and ending with any number	<i>MCC.K.CC.3</i>
3:4	Number order: What comes before and after a given number in the range 0-50	<i>MCC.K.CC.2</i>

Required Resource Materials:

- Puppets

Activity:

Students will practice counting with two puppets to fifty forwards. One puppet (student) speaks loudly and the other speaks softly. Counting from zero the puppets say the numbers alternately and the students count with the puppets loudly then softly. If a puppet can squeak, get the students to close their eyes and count the squeaks the puppet made. Examples. Repeat by starting and counting forwards and backwards from different starting and ending points.

Source URL: <http://www.nzmaths.co.nz/resource/loud-and-soft>

Lucky Dip – Stage Three

Skill Number: 3:3

Teacher Learning and Understanding: **STAGE THREE**

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

<i>Stage</i>	<i>Behavioural Indicator</i>
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:3	Numeral recognition 0-50	<i>MCC.1.NBT.1</i>

Required Resource Materials:

- A container
- Numeral cards 0-50

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>

Making Tens – Stage Three

Skill Number: 3.8; 3.9

Teacher Learning and Understanding: **STAGE THREE**

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:8	Instantly recognizing patterns to 10, including doubles	<i>MCC.K.OA.1</i>
3:9	Recalling facts within 5, and doubles to 10	<i>MCC.K.OA.5</i> <i>MCC.1.OA.6</i>

Required Resource Materials:

- Counters
- Ten Frames (Material Master 4-6)

Activity:

Using Imaging:

Problem: Solve $6 + ? = 10$.

Place 6 counters on a tens frame. Read the following word story aloud: There are 6 students swinging on the playground. Some more students joined them and now there are 10 students swinging on the playground. How many students joined the 6 students? Encourage the students to solve $6 + ? = 10$ by imagining the spaces needed to fill the card up. Discuss what the students are imagining. Get them to draw what they see in the air. Revert back to the materials if needed. Record the answer on the board.

Examples: Word stories and recording for: $3 + ? = 10$, $6 + ? = 10$, $1 + ? = 10$, $6 + 4$, $? + 8 = 10$, $? + 8 = 10$...

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

More Ones and Tens – Stage Three

Skill Number: 3:6; 3:12

Teacher Learning and Understanding: **STAGE THREE**

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

<i>Stage</i>	<i>Behavioural Indicator</i>
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:6	Counting up to 50 objects by grouping the objects in tens	<i>MCC.1.NBT.2</i>
3:12	Solving addition and subtraction problems with decade numbers by counting tens in their head	<i>MCC.1.NBT.5</i> <i>MCC.1.NBT.6</i>

Required Resource Materials:

- Arrow cards
- Money

Activity:

Problem: Students will work in pairs. One student creates a two digit number, up to 50, 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.

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

Number Fans – Stage Three

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

Teacher Learning and Understanding: **STAGE THREE**

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:1	Rote counting 0-50	<i>MCC.K.CC.1</i>
3:2	Saying the forwards and backwards number word sequence in the range 0-50, starting and ending with any number	<i>MCC.K.CC.3</i>
3:3	Numeral recognition 0-50	<i>MCC.1.NBT.1</i>
3:4	Number order: What comes before and after a given number in the range 0-50	<i>MCC.K.CC.2</i>

Required Resource Materials:

- Fan Numbers Sheet

Activity:

The students use the fans to show numbers. Teacher states a number between 0 and 50 and the student holds up that number in the fan (student folds under the numbers not being called). Have student rote count from 0-50 showing each number with the fan. Have student count backwards from 50 showing each number. Have student show the numbers that come before and after a specific number using the fan numbers. Have student create a set using objects (in the range from 1-50) then show the amount using the fan numbers.

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

Number Line Flips – Stage Three

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

Teacher Learning and Understanding: **STAGE THREE**

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:2	Saying the forwards and backwards number word sequence in the range 0-50, starting and ending with any number	<i>MCC.K.CC.3</i>
3:3	Numeral recognition 0-50	<i>MCC.1.NBT.1</i>
3:4	Number order: What comes before and after a given number in the range 0-50	<i>MCC.K.CC.2</i>

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 1-50 (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>

Pipe Cleaner Numbers – Stage Three

Skill Number: 3:3

Teacher Learning and Understanding: **STAGE THREE**

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

<i>Stage</i>	<i>Behavioural Indicator</i>
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:3	Numeral recognition 0-50	<i>MCC.1.NBT.1</i>

Required Resource Materials:

- Two pipe cleaners for each student

Activity:

Say a number between 0 and 50. 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>

Rekenrek Patterns to Ten – Stage Three

Skill Number: 3:8

Teacher Learning and Understanding: **STAGE THREE**

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

<i>Stage</i>	<i>Behavioural Indicator</i>
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:8	Instantly recognizing patterns to 10, including doubles	<i>MCC.K.OA.1</i>

Required Resource Materials:

- Rekenrek

Activity:

Have students take out a rekenrek. Ask them to move a small number of beads from the left to the right. Ask "How many beads did you just push over?" and "How did you know it was ____ (number) without counting the beads?"

The teacher should look for responses like "I know that one more than five is six."

Ask the student how many more are needed to make 10.

This task is reinforcing the key knowledge of pairs of numbers that add up to 10.

Source URL: <http://www.nzmaths.co.nz/resource/using-slavonic-abacus-reinforce-five-grouping>

Rekenrek Reinforcing Five Grouping – Stage Three

Skill Number: 3:8

Teacher Learning and Understanding: **STAGE THREE**

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:8	Instantly recognizing patterns to 10, including doubles	<i>MCC.K.OA.1</i>

Required Resource Materials:

- Rekenrek

Activity:

Have students take out a Rekenrek. Ask them to move a small number of beads from the left to the right. Ask "How many beads did you just push over?" and "How did you know it was ____ (number) without counting the beads?"

The teacher should look for responses like "I know that one more than five is six."

The goal of this task is for students to be able to subitize.

Source URL: <http://www.nzmaths.co.nz/resource/using-slavonic-abacus-reinforce-five-grouping>

Rekenrek Reinforcing Ten Grouping – Stage Three

Skill Number: 3:8

Teacher Learning and Understanding: **STAGE THREE**

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:8	Instantly recognizing patterns to 10, including doubles	<i>MCC.K.OA.1</i>

Required Resource Materials:

- Rekenrek

Activity:

Have students take out a rekenrek. Ask them to move a small number of beads from the left to the right. Ask "How many beads did you just push over?" and "How did you know it was ____ (number) without counting the beads?"

The teacher should look for responses like "I know that one more than five is six."

Ask the student how many more are needed to make 10.

This task is reinforcing the key knowledge of pairs of numbers that add up to 10.

Source URL: <http://www.nzmaths.co.nz/resource/slavonic-abacus>

Rocket – Where Will I Fit? – Stage Three

Skill Number: 3:5

Teacher Learning and Understanding: **STAGE THREE**

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:5	Ordering the numbers in the range 0-50	<i>MCC.K.CC.2</i>

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.

Note: Although the number range for Stage Three is 0-50, you may or may not wish to have students play up to the number 66. If not, have the students recast the dice whenever a 6 is thrown.

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

Teens and Fingers – Stage Three

Skill Number: 3:11

Teacher Learning and Understanding: **STAGE THREE**

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:11	Solving subtraction problems from 20 by counting all the objects in their head	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 Three

Skill Number: 3:3; 3:4; 3:7; 3:8

Teacher Learning and Understanding: STAGE THREE

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:3	Numeral recognition 0-50	MCC.1.NBT.1
3:4	Number order: What comes before and after a given number in the range 0-50	MCC.K.CC.2
3:7	Comparing two numbers in the range 0-50 using number cards	MCC.1.NBT.3
3:8	Instantly recognizing patterns to 10, including doubles	MCC.K.OA.1

Required Resource Materials:

- Tens Frames (for numbers 0-10) (*You will need 5 tens frames with all 10 dots*)

Activity:

Show a numeral card and tell the students to show the matching tens frame (use five 10 frames with all 10 dots to represent 50). 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 in Tens – Stage Three

Skill Number: 3:6

Teacher Learning and Understanding: **STAGE THREE**

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:6	Counting up to 50 objects by grouping the objects in tens	<i>MCC.1.NBT.2</i>

Required Resource Materials:

- 5 dimes
- Piece of paper

Activity:

What to do:

Show your child five dimes. Explain that a dime is worth ten cents. Count together to find that the 5 dimes is 50 cents ("10, 20, 30, 40, 50"). Write down the number 50. Ask student; "How many tens are in 50?" Have the student count the number of coins to answer the question. Continue for 40, 30, 20, and 10.

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

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 Three

Skill Number: 3:1; 3:2

Teacher Learning and Understanding: **STAGE THREE**

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

<i>Stage</i>	<i>Behavioural Indicator</i>
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:1	Rote counting 0-50	<i>MCC.K.CC.1</i>
3:2	Saying the forwards and backwards number word sequence in the range 0-50, starting and ending with any number	<i>MCC.K.CC.3</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 50. 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>

Walk the Bridge – Stage Three

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

Teacher Learning and Understanding: STAGE THREE

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

<i>Stage</i>	<i>Behavioural Indicator</i>
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Description	Aligned to CCGPS
3:2	Saying the forwards and backwards number word sequence in the range 0-50, starting and ending with any number	<i>MCC.K.CC.3</i>
3:3	Numeral recognition 0-50	<i>MCC.1.NBT.1</i>
3:4	Number order: What comes before and after a given number in the range 0-50	<i>MCC.K.CC.2</i>

Required Resource Materials:

- Large Numeral Cards (numbers 1-50)

Activity:

Place large numeral cards on the ground in order from 1 to 50 to form a bridge. (You may decide to only focus on a particular number sequence, for example the numbers 27 to 35). The students count as one student steps on the number. The student who is "walking the bridge" may decide to walk forwards or backwards. The other students follow closely to produce the forward or backward counting sequence. Have the student stand on a number and discuss what is before and after that number.

Source URL: <http://www.nzmaths.co.nz/resource/walk-bridge>

What's Hidden? – Stage Three

Skill Number: 3:11

Teacher Learning and Understanding: **STAGE THREE**

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

<i>Stage</i>	<i>Behavioural Indicator</i>
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Description	Aligned to CCGPS
3:11	Solving subtraction problems from 20 by counting all the objects in their head	<i>MCC.1.OA.6</i>

Required Resource Materials:

- Plastic teddies or counters (for this particular activity the number range is 0-5)
- Containers

Activity:

State the following problem:

"Here are 3 teddies and hidden under the container there are some more. Altogether there are 5 teddies. How many teddies are hidden?"

Record $3 + ? = 5$. 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 Three

Skill Number: 3:5

Teacher Learning and Understanding: STAGE THREE

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

Stage	Behavioural Indicator
2	Counting from One on Materials The student's most advanced strategy is counting from one on materials to solve addition and multiplication problems.
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.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
3:5	Ordering the numbers in the range 0-50	MCC.K.CC.2

Required Resource Materials:

- Play money (up to 50 one dollar bills per student)

Activity:

Give each student in the group a number of one dollar bills in the number range of 1-50. 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	\$48
Phil	\$32
Bryan	\$36

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