

NZ  
Numeracy  
Project

Activities

Stage

Five

## NZ Numeracy Project Activities List – Stage Five

The following list of activities is to be used for a student who scores at Stage Five on the NZ Numeracy Assessment. Choose activities in the areas in which the student was unable to demonstrate a particular skill in order to create an "Intervention Prescription".

<b>5:1</b> <i>Identify numbers in the range 0-1,000</i>	<b>5:2</b> <i>Say the forwards and backwards number word sequences by ones, ten, hundreds, and thousands in the range of 0-1,000,000, including finding numbers that are 10, 100, and 1,000 more or less than a given number</i>	<b>5:3</b> <i>Order the numbers in the range 0-1,000</i>	<b>5:4</b> <i>Recall the number of tens and hundreds in 100s and 1,000s</i>	<b>5:5</b> <i>Round three digit whole numbers to the nearest 10 or 100</i>
<ul style="list-style-type: none"> <li>Number Hangman</li> </ul>	<ul style="list-style-type: none"> <li>Number Hangman</li> </ul>	<ul style="list-style-type: none"> <li>Rocket - Where Will I Fit?</li> <li>Who is the Richest?</li> </ul>	<ul style="list-style-type: none"> <li>Close to 1000</li> <li>How Many Ten Dollar Bills?</li> <li>Saving Hundreds</li> <li>Zap</li> </ul>	<ul style="list-style-type: none"> <li>Can You Guess?</li> </ul>
<b>5:6</b> <i>Recall the multiples of 100 that add up to 1,000</i>	<b>5:7</b> <i>Identify the symbols for halves, quarters, thirds, fifths, and tenths including fractions greater than 1</i>	<b>5:8</b> <i>Order fractions with the same denominator</i>	<b>5:9</b> <i>Know the number 1, 10, and 100 before and after a given number in the range 0-1,000</i>	<b>5:10</b> <i>Recall addition and subtraction facts to 20</i>
<ul style="list-style-type: none"> <li>Close to 1000</li> <li>Zap</li> </ul>	<ul style="list-style-type: none"> <li>Creating Fractions</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>Number Hangman</li> </ul>	<ul style="list-style-type: none"> <li>Bowl a Fact</li> <li>Bridges</li> <li>Bridges Game</li> <li>Comparisons</li> <li>Dinosaur Stomp</li> <li>What's Hidden?</li> </ul>
<b>5:11</b> <i>Recall groupings within 100</i>	<b>5:12</b> <i>Solve addition and subtraction problems by using doubles</i>	<b>5:13</b> <i>Solve addition problems by using compatible numbers</i>	<b>5:14</b> <i>Solve addition and subtraction problems by using place value partitioning</i>	
<ul style="list-style-type: none"> <li>Adding in Parts</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>Compatible Numbers</li> </ul>	<ul style="list-style-type: none"> <li>Adding in Parts</li> <li>On and Off the Train</li> <li>Saving Hundreds</li> <li>Zap</li> </ul>	
<b>5:15</b> <i>Solve addition and subtraction problems by compensating with tidy numbers</i>	<b>5:16</b> <i>Solve multiplication problems by using repeated addition</i>		<b>5:17</b> <i>Solve fives times tables by doubling and halving</i>	
<ul style="list-style-type: none"> <li>Jumping the Number Line</li> </ul>	<ul style="list-style-type: none"> <li>Adding Tens</li> <li>Animal Arrays</li> <li>Bowl a Fact</li> <li>Multidice Five</li> </ul>		<ul style="list-style-type: none"> <li></li> </ul>	
<b>5:18</b> <i>Find unit fractions of sets</i>	<b>5:19</b> <i>Find unit fractions of regions</i>		<b>5:20</b> <i>Solve division problems by sharing</i>	
<ul style="list-style-type: none"> <li>Creating Fractions</li> <li>Fraction Animals</li> </ul>	<ul style="list-style-type: none"> <li>Creating Fractions</li> <li>Hot Stuff!</li> <li>Playdough Fractions</li> <li>Playdough Fractions - Feeding Animals</li> <li>Playdough Fractions - Same but Different</li> </ul>		<ul style="list-style-type: none"> <li></li> </ul>	

# Adding in Parts – Stage Five

Skill Number: 5:14

## Teacher Learning and Understanding: STAGE FIVE

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

### Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
5:14	Solve addition and subtraction problems by using place value partitioning	MCC.2.NBT.7

### Required Resource Materials:

- Bundled sticks or Beans in canisters (tens and ones).
- Two blank Tens Frames
- Counters or Magnetized Ten Frames board with magnets

### Activity:

#### Using Manipulatives:

**Problem:** Peter has 8 oranges and 6 apples. How much fruit does he have altogether?

Record  $8 + 6$  on the board. Model 8 on a tens frames. Ask the students, without touching the tens frames, to say where 6 more go. And then say what  $8 + 6$  equals.

Invite a student who says 14 is the answer to come and demonstrate how they got the answer. Record  $8 + 6 = 14$  on the board.

**Examples.** Create word stories and recording for:  $5 + 6$ ,  $9 + 7$ ,  $8 + 5$ ,  $7 + 6$ ,  $8 + 7$ ,  $4 + 8$ ,  $3 + 9$ ...

**Problem:** Tim has \$38 and saves \$5 more. How much money does he have left?

Record  $38 + 5$  on the board. Let students model 38 with bundled sticks or Beans in canisters. The students make a bundled ten to get the answer. Discuss how the students get 43 as the answer.

**Examples.** Create word stories and recording for:  $45 + 6$ ,  $29 + 7$ ,  $8 + 45$ ,  $7 + 46$ ,  $28 + 7$ ,  $4 + 28$ ,  $33 + 9$ ...

#### Using Representation:

##### Bridging from Concrete to

**Representational: Problem:**  $38 + 7$  equals what?

For a problem like  $38 + 7$  the students need to make the connection that removing 2 from the 7 and adding it to 38 creates a 40. There are 5 left so the answer is 45. For those students who do not make the connections go back to showing the materials and work through the solution.

##### Representation Only:

**Examples.** Create word stories and recording for:  $35 + 7$ ,  $42 + 9$ ,  $6 + 38$ ,  $6 + 35$ ,  $36 + 8$ ,  $5 + 36$ ...

##### Using Number Properties (Abstract)

**Examples.** Create word stories and recording for:  $75 + 8$ ,  $9 + 48$ ,  $6 + 67$ ,  $75 + 7$ ,  $74 + 7$ ,  $94 + 7$ ,  $9 + 89$ ...

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

# Adding Tens – Stage 5

**Skill Number:** 5:16

**Teacher Learning and Understanding: STAGE FIVE**

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

**Skill Descriptions Aligned to CCGPS:**

	Skill Descriptions	Aligned to CCGPS
5:16	Solve multiplication problems by using repeated addition	MCC.2.OA.4

**Required Resource Materials:**

- Shield (dark cloth, bucket, paper, etc.)
- Ones and tens materials (sticks in bundles, play money, base ten blocks, 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:**

**Problem:** Hemi has 39 sweets and he buys a packet of 20 sweets. How many does he have altogether?

Record  $39 + 20$  on the board. Get students to model 39 then 20 on tens and ones material. The students work out the answer using material and then discuss the answer. Write  $39 + 20 = 59$  on the board.

**Examples:** Word stories and recording for:  $35 + 20$ ,  $42 + 10$ ,  $20 + 34$ ,  $21 + 50$ ,  $40 + 27$  ...

**Using Imaging:**

**Shielding:**

Write  $34 + 20$  on the board and ask the students how they would build 34 and 20 separately. Then hide 34 and 20 under an ice cream container. Ask the students how many tens there are under the container. Discuss the idea that because  $3 + 2 = 5$  then 3 tens of 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.

**Shielding and Imaging Only:**

**Examples:** Word stories and recording for:  $18 + 20$ ,  $30 + 24$ ,  $23 + 40$ ,  $13 + 50$ ,  $10 + 46$  ...

**Using Number Properties:**

**Examples:**  $87 + 10$ ,  $78 + 20$ ,  $20 + 62$ ,  $46 + 50$ ,  $80 + 17$  ...

**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>

# Animal Arrays – Stage 5

**Skill Number:** 5:16

## Teacher Learning and Understanding: STAGE FIVE

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

### Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
5:16	Solve multiplication problems by using repeated addition	MCC.2.OA.4

### Required Resource Materials:

- Animal Strips and Number Line to 100

### Activity:

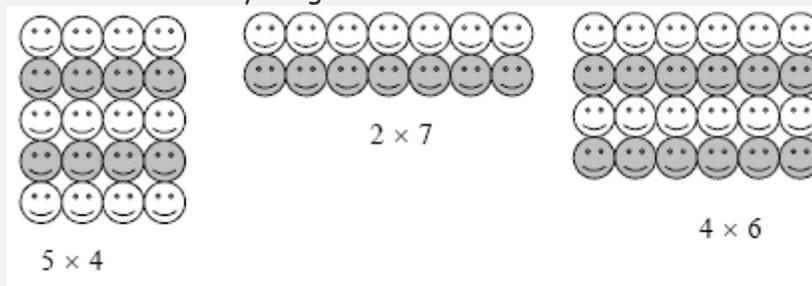
#### Using Manipulatives:

Have students close their eyes as you lay down five three-animal cards in an array (rows and columns). Ask the students to work out how many animals there are in total in any way they can. Record the strategies that they use with symbols, for example:  $3 + 3 + 3 + 3 + 3$ ,  $5 + 5 + 5$ ,  $10 + 5$ ,  $5 \times 3$ ,  $3 \times 5$

Discuss the meaning of the symbols in each expression. Ask, "What should be done to turn the animal array into  $7 \times 3$ ? (add two three-animal cards)". Ask, "What would the total number of animals be for seven rows of three?"

Students should explain how they found their answers.

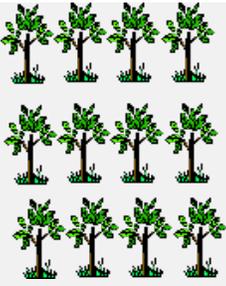
Provide other arrays for students to see. Record each array as an operation expression, as students suggest them. Suitable arrays might be:



Lay down multiplication cards, e.g.,  $6 \times 5$ . Invite students to form the array and work out the total number of animals involved.

#### Using Representation:

Form arrays with the animal cards but turn the cards upside down. Turnover one or two cards in the array to allow students to recognize one of the factors. Ask them what multiplication expression would give the total number of animals.



Allow the student to work out the total number of animals by drawing a representation. Encourage part-whole methods such as  $4 + 4 = 8$ ,  $8 + 8 = 16$ .

Place more animal strips of the same size in the array and ask students to use the previous operation to work out the next. Similarly take strips away from the array. Record the operations using multiplication statements:  $4 \times 4 = 16$ , so  $5 \times 4 = 20$ , so  $7 \times 4 = 28$ , etc. Suitable arrays might be:  $3 \times 6 = ?$  so  $4 \times 6 = ?$   $4 \times 5 = ?$  so  $6 \times 5 = ?$   $7 \times 2 = ?$  so  $6 \times 2 = ?$   $6 \times 3 = ?$  so  $5 \times 3 = ?$

### Using Number Properties (Abstract):

Provide the students with related multiplication problems. Discuss the meaning of each problem. For example  $10 \times 3 = \underline{\quad}$  so  $9 \times 3 = \underline{\quad}$ , as, "ten sets of three," and "nine sets of three." Look for students to use either knowledge of the fact or part-whole methods to solve each problem and to derive one fact from the other. For example,  $10 \times 3 = 30$  so  $9 \times 3 = 27$ , three less. Suitable problems are:

$2 \times 8 = ?$  so  $3 \times 8 = ?$   $2 \times 7 = ?$  so  $3 \times 7 = ?$   
 $5 \times 4 = ?$  so  $6 \times 4 = ?$   $5 \times 6 = ?$  so  $6 \times 6 = ?$   
 $10 \times 4 = ?$  so  $9 \times 4 = ?$   $10 \times 7 = ?$  so  $9 \times 7 = ?$

### Independent Work:

Use the animal cards and multiplication cards to play the game of "Multiplication or Out" (see "Multiplication or Out" activity for instructions)

Source URL: <http://nzmaths.co.nz/resource/animal-arrays>

# Animals– Stage 5

## Skill Number:

## Teacher Learning and Understanding: STAGE FIVE

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

## Skill Descriptions Aligned to CCGPS:

Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. <i>a. Interpret the product <math>(a/b) \times q</math> as a parts of a partition of <math>q</math> into <math>b</math> equal parts; equivalently, as the result of a sequence of operations <math>a \times q \div b</math>. For example, use a visual fraction model to show <math>(2/3) \times 4 = 8/3</math>, and create a story context for this equation. Do the same with <math>(2/3) \times (4/5) = 8/15</math>. (In general, <math>(a/b) \times (c/d) = ac/bd</math>.)</i>	MCC5.NF.4.a
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## Required Resource Materials:

- Animal counters or Unifix cubes as a substitute.

## Activity:

### Using Manipulatives:

**Problem:** "Here is a farm (draw a farm cut in two fields on a piece of paper). The farmer uses an electric fence to make her farm into two paddocks. She has 10 animals. (Get a student to count out 10 animals or cubes). She wants to put one-half of the animals in one paddock and one-half in the other. How many animals do you think will be in each paddock?"

Allow the students access to the animal counters or cubes to work out one-half of 10. Look to see if the students can use a dealing strategy to find equal parts. Ask, "Could we have worked out the number of animals in each paddock without sharing them out?" Some students may realize that they could apply their doubles knowledge ( $5 + 5 = 10$ ).

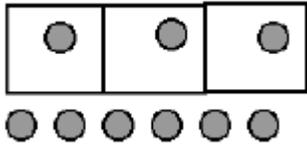
Pose similar problems and allow the students to use manipulatives to solve them. For example: "The farmer fences her farm into four paddocks.

She has 12 animals. Put one-quarter (a fourth) of the animals in each paddock."

### Using Representation:

#### Prediction:

Set up an animals and paddocks problem, such as "On this farm, there are nine animals and three paddocks. One-third of the animals have to be put in each paddock. How many animals will be in each paddock?"



"How many animals are in the paddocks at the moment?"

"How many animals are left to be put in the paddocks?"

"If you put one more in each paddock, how many animals will you have left outside the paddocks?"

"How many animals do you think will be in each paddock when you have finished sharing out the animals?"

Record the final result using symbols, i.e.,  $1/3$  of 9 is 3 (in full language, one-third of nine is three). Pose similar problems, such as: "Twenty animals. One-fifth in each paddock (five paddocks)." "Eight animals. One-quarter in each paddock (four paddocks)."

### Using Number Properties (Abstract):

The number size is increased to promote generalization. "The farmer has 40 animals and 10 paddocks. She wants to put the same number of animals in each paddock. What fraction will that be?" (one-tenth)

"How many animals will be in each paddock and why?" Look for responses like:

"There will be four in each paddock. One in each paddock is 10, two is 20, three is

30, four is 40." "If you put two animals in each paddock, that would be 10 and 10. That's 20, so four in each paddock must be 40."

Note that the students' application of strategies will be dependent on their skip counting and addition knowledge. Restrict the examples used to numbers for which students will have counting sequences, like twos, fives, and tens, or doubles knowledge, in the case of halves and quarters. For example: "One hundred animals. Two paddocks." "Thirty-five animals. Five paddocks. "

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

# Bowl a Fact – Stage Five

Skill Number: 5:10; 5:16

## Teacher Learning and Understanding: STAGE FIVE

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

### Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
5:10	Recall addition and subtraction facts to 20	<i>MCC.2.OA.2</i>
5:16	Solve multiplication problems by using repeated addition	<i>MCC.2.OA.4</i>

### Required Resource Materials:

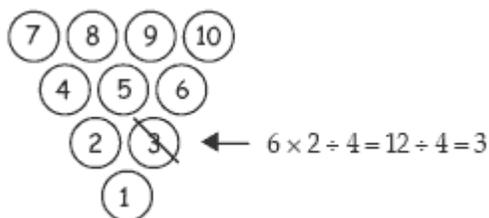
\* 3 dice

\* 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 with any of the four operations, and brackets if needed, to make up a number sentence that "bowls out" numbers in the triangle.

For example, if 6, 4, and 2 are thrown, a number sentence might be  $6 \times 2 \div 4 = 12 \div 4 = 3$ , so the ball with 3 in it is "bowled out". Similarly, 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.



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

# Bridges – Stage Five

Skill Number: 5:10

## Teacher Learning and Understanding: STAGE FIVE

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

### Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
5:10	Recall addition and subtraction facts to 20	MCC.2.OA.2

### Required Resource Materials:

- Strings of 100 beads in color groups of five with decades marked with supermarket tags
- Dice marked 5, 6, 7, 8, 9, 10
- Dominoes
- Bridges game boards

### Activity:

The students should play the game Bridges to consolidate up through 10 and back through 10 strategies (see "Bridges Game" activity for directions on how to play).

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 18 and throws a seven must predict that jumping seven beads will get their peg to 25, then check this by moving their clothespin.

Focus the students on bridging tens. For example, for  $18 + 7$ , firstly  $18 + 2 = 20$ . This leaves five of the seven. So  $20 + 5 = 25$ . If the player incorrectly predicts which bead they will land on, they lose that turn. The player who gets over 100 first wins.

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

# Bridges Game – Stage Five

Skill Number: 5:10

## Teacher Learning and Understanding: STAGE FIVE

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

### Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
5:10	Recall addition and subtraction facts to 20	MCC.2.OA.2

### 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>

# Can You Guess? – Stage 5

**Skill Number:** 5:5

**Teacher Learning and Understanding: STAGE FIVE**

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

Stage	Behavioral Indicator
4	<p><b>Advanced Counting</b></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>
5	<p><b>Early Additive Part-Whole Thinking</b></p> <p>The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.</p>

**Skill Descriptions Aligned to CCGPS:**

	Skill Descriptions	Aligned to CCGPS
5:5	Round three digit whole numbers to the nearest 10 or 100	<i>MCC.3.NBT.1</i>

**Required Resource Materials:**

- Chart paper (or white board) and markers

138	36	95
	249	185
310		

**Activity:** Draw this chart on board.

Tell the class that the aim of the activity is to locate pairs of numbers which fit the given criteria.

*Which pairs have a total between 250 and 300? (avoid exact sum or difference)*

*How do you know? How did you work that out?*

Variations

Total close to 250

Difference close to 50

Total close to 350

Difference close to 75

Source URL: <http://www.nzmaths.co.nz/resource/can-you-guess>



# Comparisons – Stage Five

Skill Number: 5:10

## Teacher Learning and Understanding: STAGE FIVE

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

### Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
5:10	Recall addition and subtraction facts to 20	MCC.2.OA.2

### Required Resource Materials:

- Counters

### Activity:

#### Using Materials:

#### State the following problem:

"Martin has \$7 and David has \$3 more than Martin. How much money does David have?"

In pairs the students build a line of 7 counters for Martin and experiment with building David's line alongside Martin's. Discuss why the answer is found by  $7 + 3$ . Write  $7 + 3 = 10$  on the board.

#### State the following problem:

"Tim has \$11 and Mary has \$8 less than Tim. How much money does Mary have?"

In groups the students build 11 for Tim and experiment with building Mary's line. Discuss why the answer is found by  $11 - 8$ . Write  $11 - 8 = 3$  on the board.

#### Continue with more problem examples:

Comparison word stories and recording for:  $8 + 3$ ,  $11 - 2$ ,  $7 - 3$ ,  $11 - 5$ ,  $7 + 3$ ,  $4 + 5$ ,  $10 - 8$ ...

#### Using Imaging:

#### Shielding and Imaging Only:

Examples: Comparison word stories and recording for:  $2 + 6$ ,  $12 - 4$ ,  $7 - 6$ ,  $11 - 2$ ,  $4 + 5$ ,  $2 + 11$ ,  $10 - 4$ ...

#### Using Number Properties:

Examples: Comparison word stories and recording for:  $28 + 6$ ,  $12 - 4$ ,  $7 - 6$ ,  $11 - 2$ ,  $4 + 5$ ,  $2 + 11$ ,  $10 - 4$

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

# Compatible Numbers – Stage Five

Skill Number: 5:13

## Teacher Learning and Understanding: STAGE FIVE

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

### Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
5.13	Solve addition problems by using compatible numbers	MCC.2.NBT.7

### Required Resource Materials:

- Counters

### Activity:

#### Using Materials:

**Problem:** Tina has 6 tomatoes, Miriam has 2 tomatoes and Liam has 3 tomatoes. They use 9 tomatoes for a salad. How many tomatoes are left?

Discuss how to record the problem then record  $6 + 2 + 3 - 9$  on the board. The students model piles of 6, 2 and 3 counters. Discuss which two piles make 9 and remove them to leave 2. Record 2 on the board.

**Examples:** Word stories and recording for:  $5 + 2 + 5 - 10$ ,  $9 + 5 + 1 - 6$ ,  $8 + 2 + 7 - 9$ ,  $4 + 5 - 9$ ,  $3 + 5 + 5 - 8$ ,  $4 + 6 + 4 + 3 - 7$ ...

#### Using Imaging:

**Examples:** Word stories and recording for:  $4 + 2 + 5 - 9$ ,  $8 + 5 + 2 - 7$ ,  $10 + 2 + 7 - 12$ ,  $10 + 5 - 15$ ,  $3 + 2 + 6 - 5$ ,  $2 + 6 + 4 + 3 - 7$

#### Using Number Properties:

**Examples:** Write these numbers on paper and cross out pairs and the numbers subtracted to get the answers:  $8 + 6 + 4 - 10$ ,  $7 + 8 + 2 - 9$ ,  $7 + 3 + 3 + 7 - 10 - 10$ ,  $1 + 2 + 5 + 2 - 7 - 3$ ,  $9 + 6 + 4 - 7 - 2$  ...

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

# Creating Fractions – Stage Five

**Skill Number:** 5:7; 5:18; 5:19

**Teacher Learning and Understanding: STAGE FIVE**

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

Stage	Behavioral Indicator
4	<p><b>Advanced Counting</b></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>
5	<p><b>Early Additive Part-Whole Thinking</b></p> <p>The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.</p>

**Skill Descriptions Aligned to CCGPS:**

	Skill Descriptions	Aligned to CCGPS
5:7	Identify the symbols for halves, quarters, thirds, fifths, and tenths including fractions greater than 1	<i>MCC.3.NF.1</i>
5:18	Find unit fractions of sets	<i>MCC.3.NF.1</i>
5:19	Find unit fractions of regions	<i>MCC.2.G.3</i>

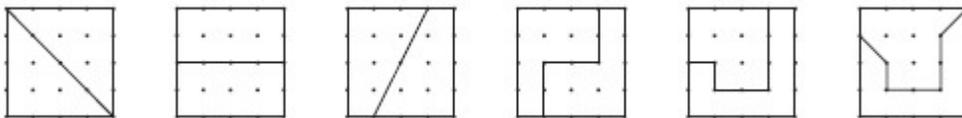
**Required Resource Materials:**

- Geoboards
- Rubber Bands
- Fractions on Geoboards Sheet

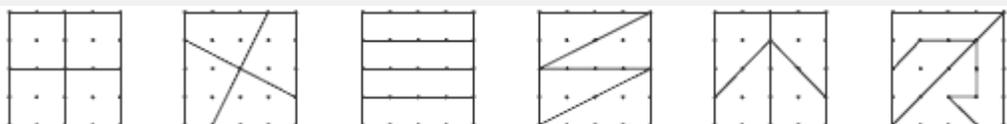
**Activity:**

Have students fold a piece of paper a number of times and name the unit fractions created after each fold: halves, quarters, and eighths.

Have students create halves, quarters, and eighths on a geoboard in as many different ways as they can. For example, all of these geoboards show halves:



All of these geoboards show quarters:



Once they have created the fractions on geoboards, the students can record them on geoboard sheets.

**Extension Activity:**

Draw different-sized geoboards using dots on squared paper and show fractions on them. For example, draw an 8 x 3 dotted geoboard and show sixths on it.

**Source URL:** <http://www.nzmaths.co.nz/resource/creating-fractions>

# Dinosaur Stomp – Stage Five

**Skill Number:** 5:10

## Teacher Learning and Understanding: **STAGE FIVE**

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

### Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
5:10	Recall addition and subtraction facts to 20	<i>MCC.2.OA.2</i>

### Required Resource Materials:

- Dinosaur Stomp Game Board (1-10)
- 10 counters

### Activity:

How to play Dinosaur Stomp

This is a game for 2 teams. One team will be the Stegs (odd numbers) and the other team T-Rexs (even numbers). If only one student is playing then the teacher must be the opponent from the other team. Place the Dinosaur Stomp Game Board (11-20-) in the middle of the table. On the count of three have one student from each team show a finger pattern on two hands (student holds up 6, 7, 8, 9, or 10 fingers). Have all of the students playing the game determine the total number of fingers. Place a counter on the matching number on the game board. Continue the game in like manner until one team wins.

Winning team could be...

- First to get 3 numbers in their column
- First to get 4 numbers in their column
- First to get all 5 numbers in their column

Encourage students to share how they solved the problem.

Discuss odd and even numbers.

### Source

URL: <http://mathsleadteachers.wikispaces.com/file/view/Dinosaur%20Stomp.pdf/180682605/Dinosaur%20Stomp.pdf>

# Fraction Animals – Stage 5

Skill Number: 5:18

## Teacher Learning and Understanding: STAGE FIVE

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

### Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
5:18	Find unit fractions of sets	MCC.3.NF.1

### 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.

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

# Hot Stuff! – Stage 5

**Skill Number:** 5:19

## Teacher Learning and Understanding: **STAGE FIVE**

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

Stage	Behavioral Indicator
<b>4</b>	<b>Advanced Counting</b> 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.
<b>5</b>	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

### Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
5:19	Find unit fractions of regions	<i>MCC.2.G.3</i>

### Required Resource Materials:

- Hot Stuff! activity sheet
- Hot Stuff! Circular Fractions sheet

### Activity:

These activities provide a context for finding fractions of a whole and also introduce the idea of fractions greater than one. The prior knowledge that the students need for this activity is recognition of fractions and an understanding of how the symbols for fractions work. For example,  $\frac{3}{4}$  means there are four equal parts and three parts have been selected. Ensure that the students have been exposed to all fractions from halves to tenths. Learning to recognize fractions can be fun if they are learned through games such as bingo. Displaying fractions in your classroom would also help to make fractions more easily recognized symbols.

### Activity One

Modeling what nine pieces of pizza looks like, using commercially available fraction kits or the circular fractions sheet would be a good introduction to this activity. Ask the students to form one whole pizza and see how much is left over. Discuss ways to record this amount as  $\frac{9}{6}$ , 1 and  $\frac{3}{6}$ ,  $\frac{13}{6}$ , or  $\frac{11}{2}$ .

Establish the fact that six pieces makes one whole ( $\frac{6}{6} = 1$ ), and so  $\frac{7}{6}$  is 1 and  $\frac{1}{6}$  or  $\frac{11}{6}$ .

### Activity Two

This activity asks students to add whole numbers and fractions. The students can model the cake slices using fraction sets or the circular fractions sheet. It may be necessary to break this activity into smaller parts. Try making a model of Monday's 1 and  $\frac{5}{8}$  cakes and Tuesday's 2 and joining the two models together to make 3 and  $\frac{5}{8}$  cakes. Then gradually add on each day's cakes after that.

### Answers to Activities

#### Activity One

1. One whole pizza and three pieces
2. Paolo knows that 6 sixths make a whole pizza. There is one piece left over, which is 1 sixth, so he has sold  $\frac{11}{6}$  pizzas.

#### Activity Two

1. a. 2  
b.  $\frac{7}{8}$   
c.  $\frac{13}{8}$

- d.  $\frac{11}{8}$
- 2. 7 whole cakes
- 3. 8 pieces

**Source URL:** <http://www.nzmaths.co.nz/resource/hot-stuff-0>

# How Many Ten Dollar Bills? – Stage 5

**Skill Number:** 5:4

**Teacher Learning and Understanding: STAGE FIVE**

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

**Skill Descriptions Aligned to CCGPS:**

	Skill Descriptions	Aligned to CCGPS
5:4	Recall the number of tens and hundreds in 100s and 1,000s	MCC.2.NBT.1

**Required Resource Materials:**

- Play Money - Ten Dollar Bills

**Activity:**

**Using Materials**

**Problem:** Mrs. Jones takes her class to the circus. She has \$237 to pay for the students to get in. Admission is \$10 per person. She has 25 in her class. Does she have enough money?

The students solve the problem in groups with play money. Write 237 on the board and discuss the 2 - ask how many tens this is worth. Then ask how many tens needed altogether. And answer the question - there is not enough money.

**Examples:** Word stories and recording for: \$167 for 13 students, \$203 for 41 students, \$203 for 21 students, \$199 for 18 students, \$167 for 17 students...

**Problem:** Mrs. Jones collects \$10 from each of her class to go to the zoo. She collects from 17 students. How much money does she have?

**Examples:** Word stories and recording for: 15 ten dollar bills, 26 ten dollar bills, 13 ten dollar bills, 21 ten dollar bills....

**Using Imaging**

**Shielding and Imaging Only:**

**Examples:** Word stories and recording for:

12 ten-dollar bills      29 ten-dollar bills      19 ten-dollar bills  
31 ten-dollar bills      34 ten-dollar bills      45 ten-dollar bills

**Using Number Properties**

**Problem:** Boxes of chocolates cost \$10 each. How many boxes can Charlotte buy if she has \$589 to spend? Discuss the solution. Examples. Repeat for: \$867, \$701, \$327, \$991, \$563....

**Source URL:** <http://www.nzmaths.co.nz/resource/how-many-ten-dollar-bills>

# Jumping the Number Line – Stage Five

Skill Number: 5:15

Teacher Learning and Understanding: **STAGE FIVE**

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
5:15	Solve addition and subtraction problems by compensating with tidy numbers	MCC.2.NBT.7

**Required Resource Materials:**

- Large Number Line
- Number Lines

**Activity:**

**Using Materials**

**State the following problem:** "Freddie the frog lives at number 28 on the number line. He wants to visit his friend at number 81. How far does he have to jump to get there?"

Stick the large number line on the board and record  $28 + ? = 81$ .

Suggest Freddie will first jump to 30 because it is a "nice" or "tidy" number. Show this jump with an arrow and ring the jump of 2. Discuss how far Freddie has to go. Some students will jump by tens to 80 then go 1 more. Some will jump 50 then 1 more, and a few will jump 51 directly to 81. Show these jumps with arrows and ring the numbers. In all cases focus attention on the ringed numbers always giving the answer 53. Discuss which way is best. The students now do individual work with you observing their methods.

**Examples.** Give the students the first sheet from Material Master 5-12 and get them to write the following 7 problems down against each number line.  $39 + ? = 61$ ,  $48 + ? = 81$ ,  $57 + ? = 85$ ,  $29 + ? = 78$ ,  $18 + ? = 60$ ,  $27 + ? = 93$ ,  $36 + ? = 90$

The students do the problems then discuss the answers back as a whole group.

**Using Imaging**

**Problem: Solve  $18 + ? = 73$**

Draw a large empty number line on the board and discuss where to place the 18 and 73. Without adding 30, 40, 50, 60 and 70 to the empty number line discuss how to jump from 18 to 20 then to 73 in two steps. So the only numbers on the number line are 18, 20 and 73. Record the answer 55.

**Examples.** Get the students to turn over their sheet to use the empty number lines. It has 7 empty number lines. Get them to write the following 7 problems down against each number line;  $29 + ? = 62$ ,  $58 + ? = 93$ ,  $27 + ? = 86$ ,  $29 + ? = 78$ ,  $48 + ? = 70$ ,  $29 + ? = 83$ ,  $46 + ? = 83$

**Source URL:** <http://www.nzmaths.co.nz/resource/jumping-number-line>

# Multidice Fives – Stage Five

Skill Number: 5:16

## Teacher Learning and Understanding: STAGE FIVE

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

## Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
5:16	Solve multiplication problems by using repeated addition	MCC.2.OA.4

## Required Resource Materials:

- Multidice Fives Game Board (make one copy for each student)
- Up to 25 counters
- One dice numbered 4 thru 9

## Activity:

Place a Multidice Fives Game Board in front of each student. Have the students take turns rolling the dice and multiplying the first number on the dice by 5. The student would use a counter to cover the answer (only one space may be covered per turn and only the student who rolls the dice can cover his/her answer). Continue the game in like manner until one student has 5 counters in a row (row, column, or diagonal).

Source URL: <http://mathsleadteachers.wikispaces.com/file/detail/Multidice%20Fives.doc>

# Number Hangman – Stage Five

**Skill Number:** 5:1; 5:2; 5:9

**Teacher Learning and Understanding: STAGE FIVE**

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

Stage	Behavioral Indicator
<b>4</b>	<p><b>Advanced Counting</b></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>
<b>5</b>	<p><b>Early Additive Part-Whole Thinking</b></p> <p>The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.</p>

**Skill Descriptions Aligned to CCGPS:**

	Skill Descriptions	Aligned to CCGPS
5:1	Identify numbers in the range 0-1,000	<i>MCC.2.NBT.3</i>
5:2	Say the forwards and backwards number word sequences by ones, ten, hundreds, and thousands in the range of 0-1,000,000, including finding numbers that are 10, 100, and 1,000 more or less than a given number	<i>MCC.4.NBT.2</i>
5:9	Know the number 1, 10, and 100 before and after a given number in the range 0-1,000	<i>MCC.2.NBT.8</i>

**Required Resource Materials:**

**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 - 1,000 (CCGPS Standard)

T    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 word sequences, forwards and backwards, by ones, tens, and hundreds in the range 0-1000, and skip-count, forwards and backwards, in the range 0-100 for twos, threes, fives, and tens.

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

# On and Off the Train – Stage Five

Skill Number: 5:14

## Teacher Learning and Understanding: STAGE FIVE

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

### Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
5:14	Solve addition and subtraction problems by using place value partitioning	MCC.2.NBT.7

### Required Resource Materials:

- On and Off the Train sheet
- 3 tens frames
- Counters

### Activity:

This activity is designed to have students add and subtract by making up to 10 and working back through 10. As an alternative to using empty tens frames and counters for the people, you could use egg cartons chopped down to 10 sections and plastic teddy bears for people.

Using materials (egg cartons, etc.) to model the people getting on and off the train helps the students to see the tens frames filling and emptying. In question 1, the students have to work out  $24 - 6$ . Ask them to look at the train and tell you how many are in the last carriage (four). Ask them how many more they need to take off so that six people have left the train. If they take off two more, how many will that leave in the second carriage? They can repeat this process for questions 2 to 4.

Encouraging the students to imagine what will happen helps them to develop images of the tens frames. When you think they are ready, try similar problems where you model with the equipment and then mask one or all of the carriages. Can the students visualise going back through 10 and making up to 10?

Continue in like manner using different numbers of train passengers at the various stops along the way.

### Answers to Activity

1. 18
2. 26
3. 9
4. 9

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

# Playdough Fractions – Feeding Animals – Stage 5

**Skill Number:** 5:19

**Teacher Learning and Understanding: STAGE FIVE**

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

Stage	Behavioral Indicator
<b>4</b>	<p><b>Advanced Counting</b></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>
<b>5</b>	<p><b>Early Additive Part-Whole Thinking</b></p> <p>The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.</p>

**Skill Descriptions Aligned to CCGPS:**

	Skill Descriptions	Aligned to CCGPS
5:19	Find unit fractions of sets	<i>MCC.3.NF.1</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=](http://www.nzmaths.co.nz/resource/fraction-bits-and-parts?parent_node=)

# Playdough Fractions - Same but Different – Stage 5

Skill Number: 5:19

## Teacher Learning and Understanding: STAGE FIVE

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

### Skill Descriptions Aligned to CCGPS:

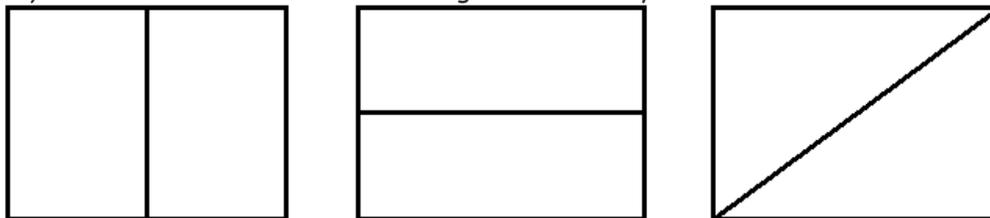
	Skill Descriptions	Aligned to CCGPS
5:19	Find unit fractions of sets	MCC.3.NF.1

### 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=](http://www.nzmaths.co.nz/resource/fraction-bits-and-parts?parent_node=)

# Rocket Where Will I Fit? – Stage Five

Skill Number: 5:3

## Teacher Learning and Understanding: STAGE FIVE

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

Stage	Behavioral Indicator
4	<p><b>Advanced Counting</b></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>
5	<p><b>Early Additive Part-Whole Thinking</b></p> <p>The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.</p>

### Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
5:3	Order the numbers in the range 0-1,000	MCC.2.NBT.4

### Required Resource Materials:

- 3 dodecahedral 0-9 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 three times. From the numbers thrown, the students decide which three digit number they will use. For example, if five and three and nine are thrown, the student could use 539, 593, 359, 395, 935, 953.

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.

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

# Saving Hundreds – Stage Five

Skill Number: 5:4; 5:14

## Teacher Learning and Understanding: STAGE FIVE

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

### Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
5:4	Recall the number of tens and hundreds in 100s and 1,000s	MCC.2.NBT.1
5:14	Solve addition and subtraction problems by using place value partitioning	MCC.2.NBT.7

### Required Resource Materials:

- Play money (Material Master 4-9).

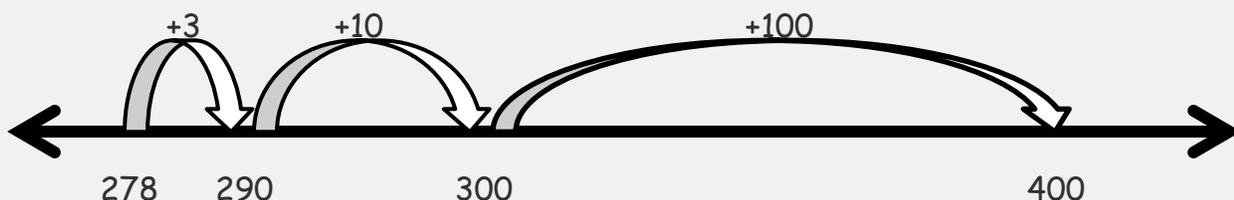
### Activity:

### Using Materials:

**Problem:** Julia has to save \$400 for a bike. She has \$287 saved. How much more does Julia have to save?

Write  $287 + ? = 400$  on the board. Select three students and say which student will be in charge of the hundreds, tens and ones. Let the "hundreds" student count out 2 hundreds, the "tens" student count out 8 tens and the "ones" student count out 7 ones. The "ones" student is given 3 ones which he swaps for 1 ten which he gives to the "tens" student and sits down. 3 is recorded on the board. Now the tens student has 9 tens and needs to get 1 ten to make 100. When she has 10 tens she swaps it for 1 hundred, gives this to the "hundreds" student and sits down. Write 10 on the board. The "hundreds" student receives a hundred. Write 100 on the board. Discuss why the answer to  $287 + ? = 400$  is 113. Notice that the order in which the extra money is given out can be varied. For example, the tens student may be given \$20 initially.

It is essential to encourage part-whole thinking strategies as students manipulate the money that is represented in the problem-task. For example, use of the open number line would be an option for students to use to explain their thinking.



Continue to provide students with multiple opportunities to prove their understanding of the task by using the following examples. Students will need to understand why, eventually, this student will have to give one of these ten dollar bills to the bank. Examples.  $484 + ? = 500$ ,  $345 + ? = 400$ ,  $290 + ? = 400$ ,  $488 + ? = 600$ ,  $67 + ? = 200$ , ...

### Using Imaging:

#### Shielding and Imaging Only:

Once students have mastered the use of materials with these activities, use the following problems to encourage mental imaging by shielding the following problems. Write one of the problems on the board and then cover the problem (shielding) and allow the students to solve using mental imaging. If the task proves to difficult, go back to using materials as an intervention.

$98 + ? = 500$ ,  $345 + ? = 400$ ,  $290 + ? = 400$ ,  $? + 488 = 700$ ,  $? + 381 = 500$ , ...

### Using Number Properties:

**Examples:** Create real-world problem-solving tasks using the following examples provided:

$106 + ? = 800$ ,  $279 + ? = 700$ ,  $378 + ? = 1000$ ,  
 $136 + ? = 800$ ,  $809 + ? = 900$ ,  $? + 378 = 1000$

**Challenging examples:**  $2990 + ? = 5000$ ,  $546 + ? = 4000$ ,  $6 + ? = 8000$ ,  $? + 450 = 5000$ ,  
 $? + 1950 = 9000$ , ...

Source URL: <http://nzmaths.co.nz/resource/saving-hundreds>

# What's Hidden? – Stage 5

Skill Number: 5:10

## Teacher Learning and Understanding: STAGE FIVE

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

### Skill Descriptions Aligned to CCGPS:

	Skill Descriptions	Aligned to CCGPS
5:10	Recall addition and subtraction facts to 20	<i>MCC.2.OA.2</i>

### Required Resource Materials:

- Plastic teddies or counters (for this particular activity the number range is 0-20)
- Containers

### Activity:

State the following problem:

"Here are 4 teddies and hidden under the container there are some more. Altogether there are 18 teddies. How many teddies are hidden?"

Record  $4 + ? = 18$ . 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 Five

Skill Number: 5:3

## Teacher Learning and Understanding: STAGE FIVE

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

Stage	Behavioral Indicator
4	<b>Advanced Counting</b> 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.
5	<b>Early Additive Part-Whole Thinking</b> The student shows simple part-whole strategies to solve addition, subtraction, multiplication, division or fraction problems mentally by reasoning the answer from basic facts and/or place value knowledge.

## Skill Descriptions Aligned to CCGPS:

	Skill Description	Aligned to CCGPS
5:3	Order the numbers in the range 0-1,000	MCC.2.NBT.4

## Required Resource Materials:

- Play money (combination of ones, fives, tens, twenties, fifties, and hundreds)

## Activity:

Give each student in the group an amount of money in the number range of 1-1000. 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	\$804
Phil	\$840
Bryan	\$864

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