



# Alternative Education Numeracy Enhanced Plan

This resource is aligned to the New Zealand Curriculum (2007) and provides support for the teaching and learning of literacy and numeracy in preparation for the NCEA Co-requisite. It aims to support those students who are using the NCEA qualification pathway.

## Manaakitanga

### Context

The activity is about demonstrating **manaakitanga** through preparing kai for others. Using a recipe of their choice, ākonga scale the recipe up for a larger group, calculate the cost, and prepare the kai.

### Achievement objectives

#### Life skills connections

Ākonga will develop skills in:

- » demonstrating manaakitanga
- » preparing kai for others
- » financial literacy.

### Numeracy connections

#### Operations with Numbers

- » Recognise the (degree of) precision required for measuring ingredients for a recipe.
- » Work with fractions and decimals when measuring and scaling up a recipe.

#### Statistics and data

- » Select and use the appropriate measuring equipment to measure mass and volume when cooking or baking.

### Resources:

- » Written for whānau to use at home with children, this NZMaths resource, [Te Tunu Pihikete](#), provides baking pātai (questions) and vocabulary in te re Māori.
- » [Fraction wall](#).
- » [Banana pancakes recipe](#).

### Prior Learning

Before being introduced to this learning activity, ākonga will have explored the types of abbreviations shown in recipes. These will include: teaspoon (t or tsp), tablespoon (T or Tbs), cup (c), grams (g), kilograms (kg), millilitres (ml or mL), and litres (l or L).



## Making banana pancakes

**Activity note:** This activity is based on making banana pancakes. Prior to this activity, ensure that there is sufficient equipment and ingredients to make the banana pancakes. It is recommended that the ingredients are on a bench/table ready for ākonga to use.

You can also adjust this activity to your context, including using a recipe that has meaning for you and sharing the pūtake (story) behind the recipe's significance.

Provide a copy of the [banana pancakes recipe](#) to each ākonga.

| Banana pancakes                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SERVES 1*                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 200g flour<br>1t baking powder<br>1T butter, melted<br>1 large egg<br>¾ c milk<br>½ T sugar<br>¼t vanilla extract<br>1 ripe banana, mashed<br><br>* This recipe serves one person three pancakes. | <ol style="list-style-type: none"> <li>1. Combine flour and baking powder in a bowl.</li> <li>2. In a separate bowl, beat together butter, egg, milk, sugar and vanilla. Add to flour mixture and beat until smooth.</li> <li>3. Stir in the mashed banana.</li> <li>4. Heat a lightly oiled frypan over a medium heat.</li> <li>5. Spoon the batter into pan and cook until the bubbles that form on the top start to pop.</li> <li>6. Flip and cook the other side until lightly golden and cooked through.</li> <li>7. Optional: Top with maple syrup, nuts, freshly sliced bananas.</li> </ol> |

**Literacy connection:** A recipe is a procedure text type – it explains how to do something. Reading a recipe can be scaffolded for ākonga. The most important information is the ingredients and their quantities, the steps, and additional information on how/when these steps are carried out, eg “in a bowl”, “until lightly golden”. Measuring equipment is also important but is often overlooked.

In pairs, have ākonga **identify the equipment** needed to measure out each ingredient, for example, a set of scales is needed for the 200g flour because scales measure weight.

Ākonga **take turns describing** to their partner what they need to do at each step of the recipe. They highlight the equipment they need for each step, for example, in step 1, we put the flour and baking powder in the same bowl. We will need a bowl for this and a spoon to mix the flour and baking powder.



# 1 Activity 1: Sequence of learning (continued)

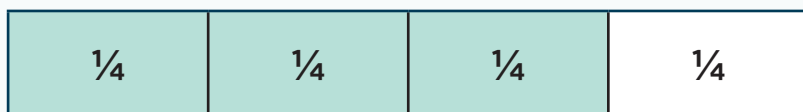
Ask ākonga to **find the appropriate equipment** to place on the kitchen bench.

**Activity note:** If ākonga need to share equipment, this could be an opportunity to discuss how they might do this respectfully and safely. You might also want ākonga to write the appropriate piece of equipment required next to the relevant ingredient or step in the method, as a note to themselves.

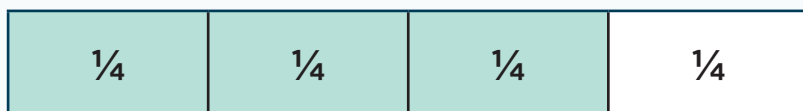
**Provide** each pair of ākonga with two eggs and two bananas. Ask ākonga to **think-pair-share** why you have given them more ingredients than what the recipe requires. If they require a hint, you could direct them to look at the top of the recipe card.

**Activity note:** The recipe card serves one person, but each pair of ākonga are making banana pancakes for two people. Since the serving size needs to be doubled (multiplied by 2), the amount of ingredients is also doubled. This can be modelled for ākonga using fraction strips:

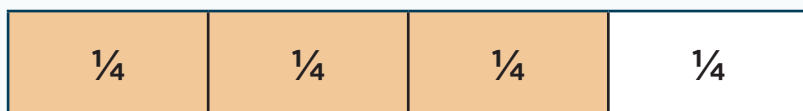
For one serving,  $\frac{3}{4}$  cup of milk is required. This can be modelled as:



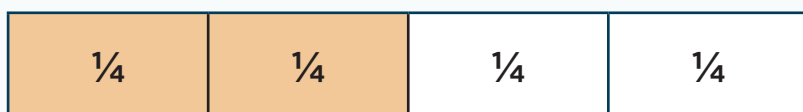
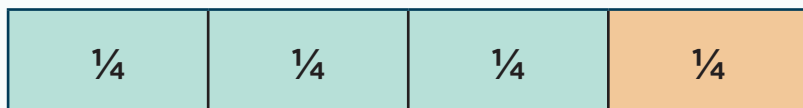
If the amount needs to be doubled, then:



+



This can be rearranged, so that ākonga can see that they need  $\frac{6}{4}$  (six-quarters) or  $1\frac{1}{2}$  (one and one half) cups of milk for two servings:



This can be written as  $\frac{3}{4} \times 2 = \frac{6}{4}$  or  $1\frac{1}{2}$



## 1 Activity 1: Sequence of learning (continued)

Support ākonga to use **fraction strips** to scale up the banana pancakes recipe.

**Activity note:** *The denominator (bottom number) tells us how to split one strip equally. This means if we needed  $\frac{3}{4}$ c of butter, the denominator tells us we need to split the strip into four equal pieces. The numerator (top number) tells us how many of the pieces we want.  $\frac{3}{4}$ c means we want three of those pieces we split in four.*

**Answers:** *The ingredients needed for the new recipe are:*

- » 400g all-purpose flour
- » 2t baking powder
- » 2T butter, melted
- » 2 large eggs
- »  $1\frac{1}{2}$  cups milk
- » 1 T sugar
- »  $\frac{1}{2}$ t vanilla extract
- » 2 ripe bananas, mashed

**Numeracy connection:** *Ākonga use visual tools to calculate the amount of ingredients required to scale up a recipe.*

As ākonga complete their calculations with your support and begin cooking, **circulate** and make sure they are **using the measuring equipment** correctly. Some things to check can be found in the table below.

| Equipment                 | Things to check                                                                                                                                                                                                                                                                                                                    |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Scales                    | <ul style="list-style-type: none"><li>» Scales read zero to start.</li><li>» Scales are placed on a flat surface.</li><li>» Scales are set to grams.</li><li>» Nothing else is on the surface of the scales.</li></ul>                                                                                                             |
| Measuring cups and spoons | <ul style="list-style-type: none"><li>» The correct one is selected for the measurement using the label on the spoon/cup, e.g. <math>\frac{1}{2}</math> cup.</li><li>» Cups need to be placed on a flat surface.</li><li>» The ingredient is level with the top of the measuring spoon/cup, not heaped or below the top.</li></ul> |
| Measuring jug             | <ul style="list-style-type: none"><li>» The correct scale is being used depending on whether the measurement is in cups or millilitres.</li><li>» The measuring jug is on a flat surface and the level of the liquid is read at eye level of the required volume marker.</li></ul>                                                 |

**Numeracy connection:** *Ākonga demonstrate the appropriate use of a range of measuring tools.*



# 1

## Activity 1: Sequence of learning (continued)

As the cooking is drawing to a close, ensure that ākonga are **supporting each other in the clean-up**, and have put away their equipment in the appropriate place. Pancakes can be kept warm by wrapping tin foil over the dish they are in.

Invite ākonga to **lead the karakia mō te kai** in a language they are comfortable with, before sharing the pancakes together.

Ask ākonga to **reflect on the numeracy in the cooking** they have done today. Encourage them to **identify further numeracy opportunities** in the preparation of kai, including developing a budget for purchasing the ingredients.



## Adapting Your Own Recipe

Invite ākonga to **describe a favourite meal, home baking, or a celebration kai from their culture**. Ākonga work in pairs to decide what they would like to make for the class together.

**Cultural connection:** *Asking ākonga to describe kai from their culture celebrates diversity and helps kaiako to get to know them.*

Support ākonga in their pairs to **locate a suitable recipe in a cookbook or online** to make this kai. The recipe should be technical enough to use a range of measuring equipment but within the skill level of the ākonga.

**Literacy connection:** *Ākonga should use a recipe in their preferred format. This could be in print form (cookbook, printed from a website, or transcribed), an online website, a video, or in oral form.*

Ākonga work with their partner to **identify any words or instructions** they want further clarification on in their recipe. You can encourage them to use the method from activity 1 to ensure that there is a shared understanding in the pair as to what they need to do.

**Literacy connection:** *Allowing ākonga to ask questions about the text supports ākonga who are working at different literacy levels.*

Support ākonga to **adapt their chosen recipes** to cater for the number of people they are cooking or baking kai for, so they know how much of each ingredient is needed. Encourage ākonga to use clear mathematical reasoning, using the work from activity 1 to support them with this.

**Numeracy connection:** *In this activity ākonga formulate and enact a plan to use mathematics to adapt quantities in a recipe.*

Invite ākonga to **share the strategies** they use to calculate how much of each ingredient is needed.

**Numeracy connection:** *Having ākonga share their methods and results supports them to understand that there are different ways to use maths to solve problems.*

## Calculating and comparing costs

Ākonga work in their pairs to **write a list of ingredients** that they need to make their recipe. They visit a supermarket website to **find the cost of each ingredient**.

Invite ākonga to **compare prices of ingredients** to find the cheapest options, for example, comparing two or more brands of flour. A limit could be put on the spending to help with budgeting skills.

**Activity note:** *If practical, ākonga could visit a supermarket or other food store to find the costs.*

Encourage ākonga to **discuss their recipe** with other pairs and find out if there are opportunities to share ingredients, for example, a bottle of milk, flour or butter.

A conversation about sharing resources to limit waste can be introduced. Once ākonga agree on what is a “shared” item, guide them in a discussion to decide who will be responsible for this and how a group resource should be paid for and shared.

**Model** how to use ‘tidy numbers’ to estimate how much it will cost to buy the ingredients and compare it to their calculation. Tidy numbers are rounded numbers that allow us to estimate the answer to a calculation.

For example:

| Ingredient         | Price  | tidy number |
|--------------------|--------|-------------|
| Milk               | \$2.57 | \$3         |
| Self-raising flour | \$2.20 | \$2         |
| Vanilla            | \$3.99 | \$4         |
| Eggs               | \$7.30 | \$7         |

**Activity note:** *When rounding to the nearest whole number of dollars, we look at the first number after the decimal point and we round up to the next dollar if the number is five or higher. If it is four or lower, it doesn't change.*

*For example, the price of milk is \$2.57 for a bottle. The first digit after the decimal point is five, so the price is rounded up to \$3. The price for a box of eggs is \$7.30. The first digit after the decimal point is a three so the price is rounded down to \$7.*

*An estimate of the total cost is  $\$3 + \$2 + \$4 + \$7 = \$16$ . The total cost can be calculated using a calculator:  $\$2.57 + \$2.20 + \$3.99 + \$7.30 = \$16.06$ . Since \$16.06 is approximately equal to \$16, ākonga can conclude that it is likely the calculation has been done correctly.*

Ākonga round each of the prices to a tidy number to **estimate the total cost of the ingredients**. Ākonga can then use a calculator to calculate the total cost and compare it to their estimate.

Invite ākonga to **share with the group** how close their estimate was to their total cost.

**Numeracy connection:** *In this activity ākonga plan ways to use maths to solve a problem and use estimation to check that their calculated cost makes sense.*



## Preparing and sharing kai

**Activity note:** In this activity, ākongā are preparing the kai from the recipe they selected in pairs and scaled up. Encourage ākongā to negotiate how they will share ingredients and equipment with each before they begin cooking or baking.

While ākongā are cooking or baking, you can discuss with them:

- » why measurements need to be more accurate when you are baking than when you are making a meal such as a stirfry
- » how to measure amounts that do not directly correspond to measuring cups/spoons according to the recipe they are following. eg. how they would measure  $\frac{3}{4}$  of a cup or  $1\frac{1}{2}$  cups.

**Numeracy connection:** These discussions can support ākongā to understand that the level of precision needed in measuring depends on the situation and help ākongā plan how to measure amounts using available measuring equipment.

Look for spontaneous opportunities to discuss with ākongā **how different fractions compare** as they prepare their kai. For example, if a recipe requires  $\frac{2}{3}$  of a cup of an ingredient and  $\frac{3}{4}$  of a cup of another ingredient, which amount is larger? How do they know?

**Activity note:** You could tip water from different measuring cups to compare volume, ask ākongā to draw a diagram (fraction strip), use a [fraction wall](#), or convert fractions to decimals or to equivalent fractions.

It is not necessary for ākongā to use all of these methods to compare fractions but it is good for them to move from comparing volumes using measuring cups to representing the problem mathematically using one of these methods.

Diagram using fraction strips:



Using equivalent fractions:

$$\frac{2}{3} = \frac{4 \times 2}{4 \times 3} = \frac{8}{12}$$

$$\frac{3}{4} = \frac{3 \times 3}{3 \times 4} = \frac{9}{12}$$

$\frac{9}{12}$  is greater than  $\frac{8}{12}$ , so  $\frac{3}{4}$  is greater than  $\frac{2}{3}$ .



## Activity 4: Sequence of learning (continued)

**Activity note (continued):** Discuss with ākonga that when fractions have the same denominator, in this case 12, the numerators can be directly compared to decide which fraction is greater.

*Converting to decimals:*

*It is useful to know the decimals of fractions such as  $\frac{2}{3}$  or  $\frac{3}{4}$  but it can be easily calculated with a calculator by dividing the numerator by the denominator.*

$\frac{2}{3} = 2 \div 3 = 0.666\dots = 0.67$  (rounded to 2 decimal places)

$\frac{3}{4} = 3 \div 4 = 0.75$

*0.75 is greater than 0.67, so  $\frac{3}{4}$  is greater than  $\frac{2}{3}$*

**Numeracy connection:** *Ākonga select appropriate representations of the maths e.g. diagrams or expressions.*

As the cooking is drawing to a close, ensure that ākonga are **supporting each other in the clean-up**, and have put away their equipment in the appropriate place.

Invite ākonga to **lead the karakia mō te kai** in a language they are comfortable with, before sharing kai together.

Ask ākonga to **reflect on the kai** they prepared. For example, they could consider what went well or how they would adapt the recipe if they made it again.

### Next steps in Numeracy learning

To build on this learning, ākonga could:

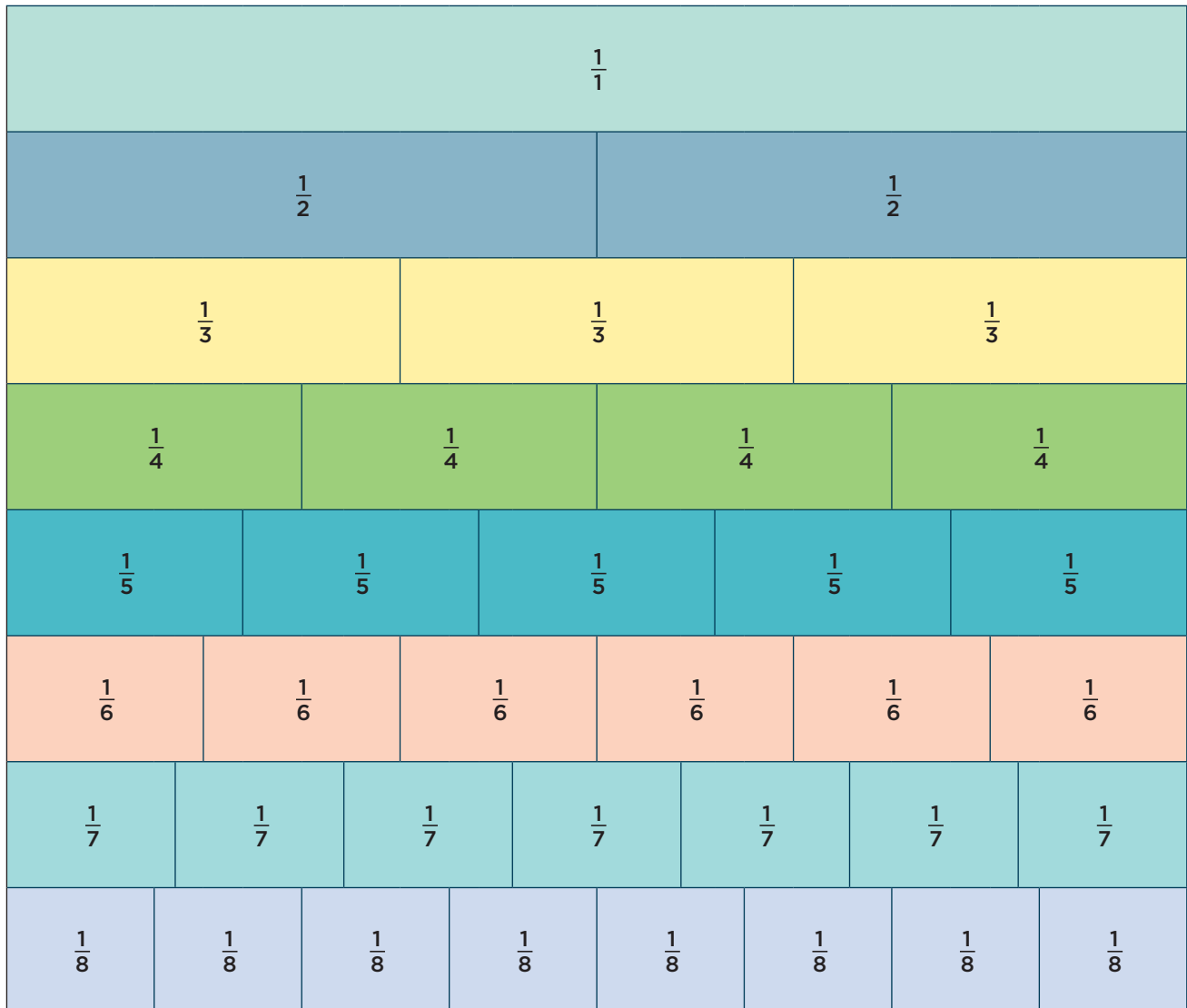
- » find or calculate unit prices (for example: \$ per kg or per 100 g) to compare the price of ingredients and select which one is better value. Unit prices are often displayed on supermarket shelves and when shopping online. Ask ākonga to reflect on why people sometimes choose items that have a higher unit price.
- » calculate the proportion of the cost of the ingredients the recipe used. For example, if the 1 litre bottle of milk was \$2.57 and your recipe used 600 mL, how much would this be? This can be connected to real world situations of kitchen, cafe, or bakery costs.
- » practise converting between units of measurement relevant to cooking and baking, for example kg and g
- » estimate and measure volumes of containers and convert between litres and millilitres, for example [using this resource](#) (pages 24-25)
- » compare the cost of takeaways to the cost of ākonga preparing meals themselves.
- » read nutrition labels and use their knowledge of percentages and weights within the context of reading charts and tables. Ākonga could compare the nutritional information of takeaways to a meal they can prepare themselves.
- » use calculations involving cooking times to answer problems using this NZMaths resource: [Cooking times](#). Encourage ākonga to find more than one answer to activity 3.

For further examples of shopping for kai calculations see this NZMaths resource: [Senior shopping activities](#).

**The Numeracy Pedagogy Guides have been developed for a number of curriculum areas and provide additional ideas on how to integrate Numeracy learning into your teaching practice.**

**Resource A**

## Fraction wall



**Resource B**

# Banana pancakes recipe

**Banana pancakes**

SERVES 1\*

200g flour  
1t baking powder  
1T butter, melted  
1 large egg  
 $\frac{3}{4}$  c milk  
 $\frac{1}{2}$  T sugar  
 $\frac{1}{4}$ t vanilla extract  
1 ripe banana, mashed

\* This recipe serves one person three pancakes.

1. Combine flour and baking powder in a bowl.
2. In a separate bowl, beat together butter, egg, milk, sugar and vanilla. Add to flour mixture and beat until smooth.
3. Stir in the mashed banana.
4. Heat a lightly oiled frypan over a medium heat.
5. Spoon the batter into pan and cook until the bubbles that form on the top start to pop.
6. Flip and cook the other side until lightly golden and cooked through.
7. Optional: Top with maple syrup, nuts, freshly sliced bananas.