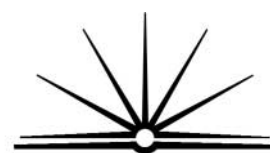
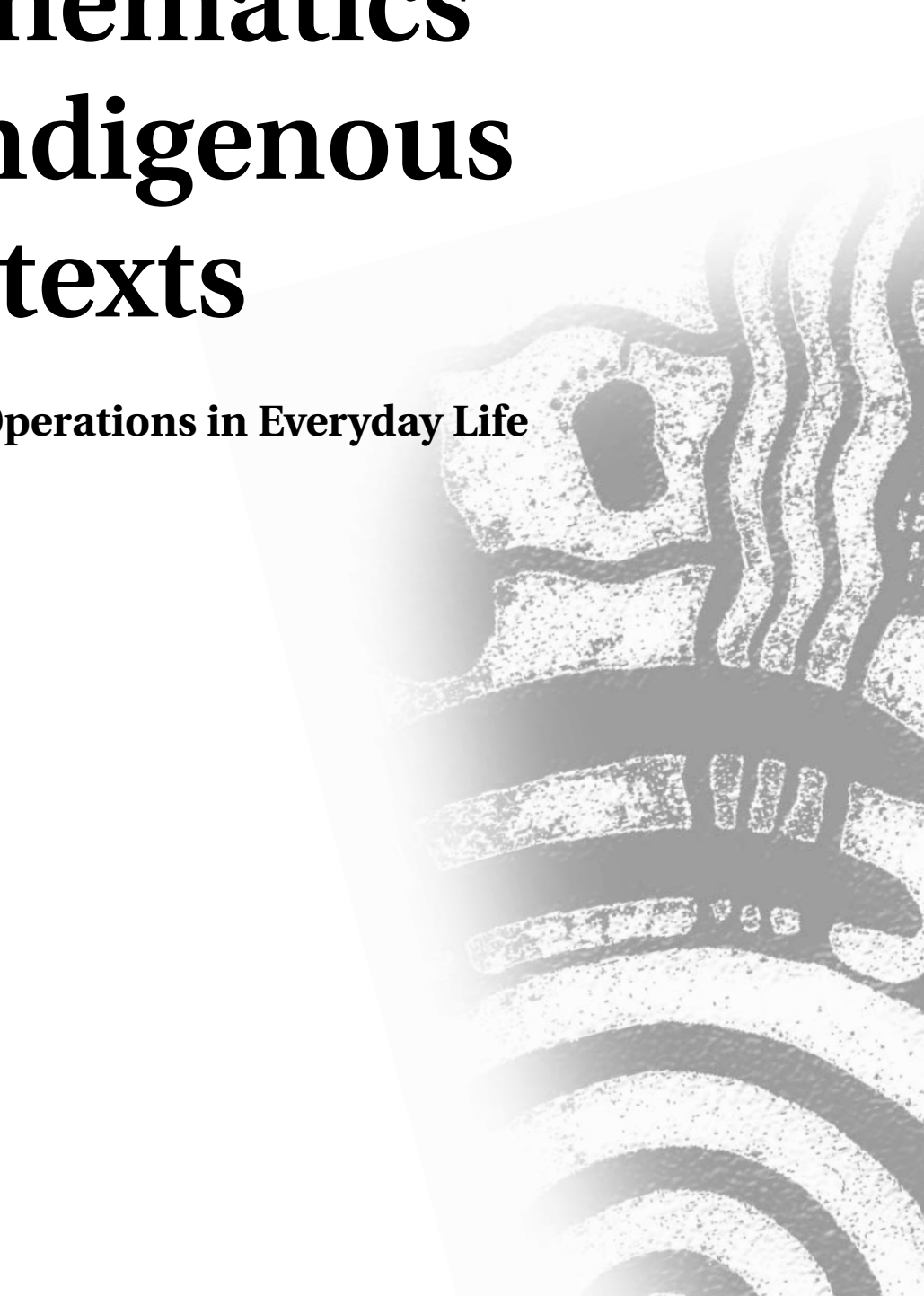


# Mathematics in Indigenous Contexts

**The Four Operations in Everyday Life**



**BOARD OF STUDIES**  
NEW SOUTH WALES

# **Mathematics Unit**

## **The Four Operations in Everyday Life**

This Stage 2 Mathematics Unit focuses on the 4 operations students and their families use everyday. The unit culminated in the class developing a shopping list and costing for a picnic with the other two classes and the purchases of the supplies.

# Mathematics Number Unit

## Lesson 1

<p><b>Outcomes:</b>  NS2.2  Uses mental and written strategies for addition and subtraction involving two-, three- and four-digit numbers  WMS2.3  Uses appropriate terminology to describe, and symbols to represent, mathematical ideas</p>	
<p><b>Indicators:</b>  The student, for example:</p> <ul style="list-style-type: none"> <li>• explains and records methods for adding and subtracting</li> <li>• uses a formal written algorithm to solve addition or subtraction problems</li> <li>• writes a procedure to outline the method used to solve a problem</li> </ul>	
<p><b>Lesson Plan:</b>  <u>School Uniform</u></p> <ul style="list-style-type: none"> <li>• Decide what you need to clothe yourself for school. (Think colour, warmth and practicality)</li> <li>• Look through the clothes catalogues and find out what is available.</li> <li>• Purchase the products keeping track of where you bought from and how much it cost.</li> <li>• Now look back and decide on a budget that everyone in 4J should be able to stick to in purchasing clothes for school. Give a dollar amount to this budget and the spending of all the money. Allow for things like sales and discounts.</li> <li>• Explain why you chose that amount for a budget.</li> </ul>	<p><b>Assessment:</b>  What would you do differently in looking over this whole task?</p> <p>Would you have changed anything that you did or the order in which you did it?</p>
<p><b>Resources:</b> Catalogues (Students had been bringing them in for the weeks prior to our lessons) – class set is ideal. Paper to write information and results on.</p>	

# Mathematics Number Unit

## Lesson 2

<p><b>Outcomes:</b>          NS2.2          Uses mental and written strategies for addition and subtraction involving two-, three- and four-digit numbers          WMS2.3          Uses appropriate terminology to describe, and symbols to represent, mathematical ideas</p>	
<p><b>Indicators:</b>          The student, for example:</p> <ul style="list-style-type: none"> <li>• explains and records methods for adding and subtracting</li> <li>• uses a formal written algorithm to solve addition or subtraction problems</li> <li>• writes a procedure to outline the method used to solve a problem</li> </ul>	
<p>Lesson Plan:  <b><u>School Materials</u></b></p> <ul style="list-style-type: none"> <li>• Decide on a list of materials that you need to operate in the classroom.</li> <li>• Think about where you could buy them from and why there is a difference.</li> <li>• Use the catalogues to find the products that you need and purchase them, making sure you keep a list of where you purchased from and their individual prices.</li> <li>• You are purchasing for a family of 3. One child in Kindergarten, one in Year 2, one in Year 4. Keeping that in mind, give the family a budget that they will need to buy all the equipment needed for the three children.</li> <li>• Explain the breakdown of this budget.</li> </ul>	<p><b>Assessment:</b>          What Maths was used in this activity?           Explain how you came to work out your budget.</p> <p><b>Evaluation:</b></p>
<p><b>Resources:</b> Catalogues (Students had been bringing them in for the weeks prior to our lessons) – class set is ideal. Paper to write information and results on.</p>	

# Mathematics Number Unit

## Lesson 3

<p><b>Outcomes:</b>  NS2.2  Uses mental and written strategies for addition and subtraction involving two-, three- and four-digit numbers  WMS2.3  Uses appropriate terminology to describe, and symbols to represent, mathematical ideas</p>	
<p><b>Indicators:</b>  The student, for example:</p> <ul style="list-style-type: none"> <li>• explains and records methods for adding and subtracting</li> <li>• uses a formal written algorithm to solve addition or subtraction problems</li> <li>• writes a procedure to outline the method used to solve a problem</li> </ul>	
<p><b>Lesson Plan:</b>  <u>School Materials – Activity 2</u></p> <ul style="list-style-type: none"> <li>• Decide on a list of materials that you need to operate in the classroom.</li> <li>• Think about where you could buy them from and why there is a difference.</li> <li>• Use the catalogues to find the products that you need and purchase them, making sure you keep a list of where you purchased from and their individual prices.</li> <li>• You are starting with a budget of \$40 only. Using repeated subtraction, order what you would like to buy – making sure you do not exceed the \$40 .</li> <li>• Make a pro forma that all children could use detailing the product you are purchasing, taking away from the money you have, leaving a lesser balance.</li> <li>• Explain the breakdown of this budget.</li> </ul>	<p><b>Assessment:</b>  What Maths was used in this activity?</p> <p>Explain how you were able to ensure you didn't blow out your budget.</p> <p>Can all children of varying ages use your pro forma?</p>
<p><b>Resources:</b> Catalogues (Students had been bringing them in for the weeks prior to our lessons) – class set is ideal. Paper to write information and results on.</p>	

# Mathematics Number Unit

## Lesson 4

<p><b>Outcomes:</b>          NS2.2          Uses mental and written strategies for addition and subtraction involving two-, three- and four-digit numbers          WMS2.3          Uses appropriate terminology to describe, and symbols to represent, mathematical ideas</p>	
<p><b>Indicators:</b>          The student, for example:</p> <ul style="list-style-type: none"> <li>• explains and records methods for adding and subtracting</li> <li>• uses a formal written algorithm to solve addition or subtraction problems</li> <li>• writes a procedure to outline the method used to solve a problem</li> </ul>	
<p><b>Lesson Plan:</b>  <u><b>Food Purchase</b></u></p> <ul style="list-style-type: none"> <li>• Decide on a type of food that you think would be appropriate for a picnic.</li> <li>• Think about the ingredients needed to make the dish and where you could buy them.</li> <li>• Use the catalogues to find the products that you need and purchase them, making sure you keep a list of where you purchased from and their individual prices.</li> <li>• You are purchasing for a class of 30. Keep in mind that everything you purchase needs to be paid for by you and your classmates.</li> <li>• Give each student a total that they will have to pay.</li> </ul>	<p><b>Assessment:</b>          What Maths was used in this activity?</p> <p>Explain how you came to work out how much each student needs to pay.</p>
<p><b>Resources:</b> Catalogues (Students had been bringing them in for the weeks prior to our lessons) – class set is ideal. Paper to write information and results on.</p>	

# Mathematics Number Unit

## Lesson 5

<p><b>Outcomes:</b>  NS2.2  Uses mental and written strategies for addition and subtraction involving two-, three- and four-digit numbers  WMS2.3  Uses appropriate terminology to describe, and symbols to represent, mathematical ideas</p>	
<p><b>Indicators:</b>  The student, for example:</p> <ul style="list-style-type: none"> <li>• explains and records methods for adding and subtracting</li> <li>• uses a formal written algorithm to solve addition or subtraction problems</li> <li>• writes a procedure to outline the method used to solve a problem</li> </ul>	
<p><b>Lesson Plan:</b>  <u><b>Celebration Day Picnic</b></u></p> <ul style="list-style-type: none"> <li>• Decide on a type of food that you think would be appropriate for a picnic.</li> <li>• Think about the ingredients needed to make the dish and where you could buy them.</li> <li>• Use the catalogues to find the products that you need and purchase them, making sure you keep a list of where you purchased them and their individual prices.</li> <li>• You are purchasing for a group of 90. Keep in mind that everything you purchase needs to be paid for by you and your grade members.</li> </ul>	<p><b>Assessment:</b>  What Maths was used in this activity?</p> <p>Explain how you came to work out how much each student needs to pay.</p> <p><b>Evaluation:</b></p>
<p><b>Resources:</b> Catalogues (Students had been bringing them in for the weeks prior to our lessons) – class set is ideal. Paper to write information and results on.</p>	

## **Assessment and Evaluation**

### **Pre-assessment:**

I asked the students to complete a task for pre-assessment (find as labeled) on purchasing food from the school canteen to a budget. Some children found this to be a very simple task, yet others did not complete the task in the 40 minutes allotted.

### **Pre-assessment findings:**

When looking at the lesson, students got particularly hung up on the purchasing from 'five food groups' and concentrated less on the 'Maths' that was there to learn and observe.

In looking at this task, if I was to re-do it, I would have simply asked the children to feed themselves from the canteen and not so much worry about the food groups.

The students were asked to reflect their thoughts of this lesson in their journals.

### **Assessment**

At the conclusion of the five (5) lessons, I completed an assessment that I thought would have been rudimentary for the students. I asked them to purchase the food for our Celebration Day Picnic and budget the cost to each student to pay for all the resources.

Many found this task very difficult, and even the top students had difficulty in being able to work out the cost per student.

In final verbal assessment, I asked the students to detail in their journals their thoughts of this project and 'whether or not they felt that they had learnt 'Maths' as well as they would have with a page or board of sums'. Surprisingly, the non-ATSI students expressed that this form of learning in context was more beneficial to their learning. The ATSI students expressed the opinion that they would learn and understand 'Maths' more if they were given sums on a page or on a board.

On a personal note of evaluation, I felt with the ATSI student's responses, that I had failed in making the learning in context beneficial, which was the purpose for this Project. In reflection, I feel that (knowing the results that Mrs. Kazakos and Mrs. Azzopardi had achieved) Mathematics in Context is beneficial for ATSI students and non-ATSI students in the strands of Space and Measurement, but not in Number. This may be a narrow view, but from my perspective in implementing a unit of work which ATSI parents, my Mentors and myself thought would be of benefit, and receiving the feed-back I did, this is my conclusion.



Name: \_\_\_\_\_

## Assessment.2 – Number

We have been talking about and looking at a picnic for 4A, 4J and 4K to conclude this project.

Using the space below, work out the following.

**(Remember to include all your working!)**

We are having a sausage sizzle and a popper each. There are no seconds and you should purchase enough to feed 90 people only.

1kg ( 10 sausages) = \$3.89

1 loaf of bread (20 slices) = \$1.20

Tomato sauce (will cover approx 30 sausages) = \$1.89

BBQ sauce (will cover approx 30 sausages) = \$1.89

Napkins (100) = \$1.60

Poppers (6 pack) = \$2.49

Total Cost of picnic:

Cost per person:

# **Groupwork Activities.**

## ***Activity 1.***

### **School Uniform**

- Decide what you need to clothe yourself for school. (Think colour, warmth and practicality)
- Look through the clothes catalogues and find out what is available.
- Purchase the products keeping track of where you bought from and how much it cost.
- Now look back and decide on a budget that everyone in 4J should be able to stick to in purchasing clothes for school. Give a dollar amount to this budget and the spending of all the money. Allow for things like sales and discounts.
- Explain why you chose that amount for a budget.

#### Reflection:

- What would you do differently in looking over this whole task? Would you have changed anything that you did or the order in which you did it?

## ***Activity 2***

### **School Materials**

- Decide on a list of materials that you need to operate in the classroom.
- Think about where you could buy them from and why there is a difference.
- Use the catalogues to find the products that you need and purchase them, making sure you keep a list of where you purchased from and their individual prices.
- You are purchasing for a family of 3. One child in Kindergarten, one in Year 2, one in Year 4. Keeping that in mind, give the family a budget that they will need to be able to buy all the equipment needed for the three children.
- Explain the breakdown of this budget.

#### Reflection:

- What Maths was used in this activity?
- Explain how you came to work out your budget.

### **Activity 3**

#### **School Materials – Activity 2**

- Decide on a list of materials that you need to operate in the classroom.
- Think about where you could buy them from and why there is a difference.
- Use the catalogues to find the products that you need and purchase them, making sure you keep a list of where you purchased from and their individual prices.
- You are starting with a budget of \$40 only. Using repeated subtraction, order what you would like to buy – making sure you do not exceed the \$40.
- Make a pro forma that all children could use detailing the product you are purchasing, taking away from the money you have, leaving a lesser balance.
- Explain the breakdown of this budget.

Reflection:

- What Maths was used in this activity?
- Explain how you were able to ensure you didn't blow out your budget.
- Can all children of varying ages use your pro forma?

### **Activity 4**

#### **Food Purchase**

- Decide on a type of food that you think would be appropriate for a picnic.
- Think about the ingredients needed to make the dish and where you could buy them.
- Use the catalogues to find the products that you need and purchase them, making sure you keep a list of where you purchased from and their individual prices.
- You are purchasing for a class of 30. Keeping in mind, that everything you purchase needs to be paid for by you and your classmates.
- Give each student a total that they will have to pay.

Reflection:

- What Maths was used in this activity?
- Explain how you came to work out how much each student needs to pay.

## **Activity 5**

### **Celebration Day Picnic**

- Decide on a type of food that you think would be appropriate for a picnic.
- Think about the ingredients needed to make the dish and where you could buy them.
- Use the catalogues to find the products that you need and purchase them, making sure you keep a list of where you purchased from and their individual prices.
- You are purchasing for a group of 90. Keep in mind that everything you purchase needs to be paid for by you and your grade members.

#### Reflection:

- What Maths was used in this activity?
- Explain how you came to work out how much each student needs to pay.

# Number

## **Sub strand - Addition and Subtraction**

Students develop facility with number facts and computation with progressively larger numbers in addition and subtraction and an appreciation of the relationship between those facts.

NS2.2

Uses mental and written strategies for addition and subtraction involving two-, three- and four-digit numbers

The student, for example:

- explains and records methods for adding and subtracting
- uses the formal written algorithm to solve addition or subtraction problems.

## **Working Mathematically**

### **Communicating**

Students develop and use appropriate language and representations to formulate and express mathematical ideas.

WMS2.3

Uses appropriate terminology to describe, and symbols to represent, mathematical ideas

The student, for example:

- writes a procedure to outline the method used to solve a problem
- discusses different methods for solving a given problem
- explains the mental strategy used to solve a problem.

The Group work activities outlined below were the original ideas for lessons. During some of the lessons or after the previous lesson, it became apparent that the outlined lesson was not going to work and therefore had to be changed. The changes are written in italics below the lesson planned.

## **Group work Activities.**

### *Activity 1.*

#### **School Uniform**

- Decide what you need to clothe yourself for school. (Think colour, warmth and practicality)
- Look through the clothes catalogues and find out what is available.
- Purchase the products keeping track of where you bought from and how much it cost.
- Now look back and decide on a budget that everyone in 4J should be able to stick to in purchasing clothes for school. Give a dollar amount to this budget and the spending of all the money. Allow for things like sales and discounts.
- Explain why you chose that amount for a budget.

#### Reflection:

- What would you do differently in looking over this whole task? Would you have changed anything that you did or the order in which you did it?

*This change for this lesson was suggested to me by my mentors Belinda and Liz. They suggested I ask the class to only 'Decide what you need to clothe yourself.' Then I was to ask the students 'what are some of the issues that come up?'*

*This was to open up the lesson and let the children's individuality come through.*

*I found that what it actually did was confuse and bewilder the majority of the class.*

*I then redid the lesson with the above format. The response was less detailed, but verbally better understood. (Suzanne already collected rolls of work – white plastic sheets)*

## **Activity 2**

### **School Materials**

- Decide on a list of materials that you need to operate in the classroom.
- Think about where you could buy them from and why there is a difference.
- Use the catalogues to find the products that you need and purchase them, making sure you keep a list of where you purchased from and their individual prices.
- You are purchasing for a family of 3. One child in Kindergarten, one in Year 2, one in Year 4. Keeping that in mind, give the family a budget that they will need to be able to buy all the equipment needed for the three children.
- Explain the breakdown of this budget.

#### Reflection:

- What Maths was used in this activity?
- Explain how you came to work out your budget.

*This lesson was very interesting for the students. I don't think that they realized just how much money it took to get them to school – and the fact that some things had to be constantly replenished. This was one of the lessons that the ASSPA parents were keen to have the children look at, so that their awareness towards expense was heightened.*

*The children were given this Activity in its entirety and asked to work within their groups to come up with the answers.*

### **Activity 3**

#### **School Materials – Activity 2**

- Decide on a list of materials that you need to operate in the classroom.
- Think about where you could buy them from and why there is a difference.
- Use the catalogues to find the products that you need and purchase them, making sure you keep a list of where you purchased from and their individual prices.
- You are starting with a budget of \$40 only. Using repeated subtraction, order what you would like to buy – making sure you do not exceed the \$40 .
- Make a pro forma that all children could use detailing the product you are purchasing, taking away from the money you have, leaving a lesser balance.
- Explain the breakdown of this budget.

#### Reflection:

- What Maths was used in this activity?
- Explain how you were able to ensure you didn't blow out your budget.
- Can all children of varying ages use your pro forma?

*This lesson was given to the students the very next day after Activity 3 so that their thoughts of materials was fresh. The difference being that they are asked to start with a figure and work back from it (using repeated subtraction).*



## **Activity 4**

### **Food Purchase**

- Decide on a type of food that you think would be appropriate for a picnic.
- Think about the ingredients needed to make the dish and where you could buy them.
- Use the catalogues to find the products that you need and purchase them, making sure you keep a list of where you purchased from and their individual prices.
- You are purchasing for a class of 30. Keep in mind, that everything you purchase needs to be paid for by you and your class. Give each student a total that they will have to pay.

### Reflection:

- What Maths was used in this activity?
- Explain how you came to work out how much each student needs to pay.

*This is a lead up lesson to the final one. Seeing as we have not looked at food yet, it was very important to first discuss the ways in which food is purchased, how to work out total costs, and the anticipated amounts each product would have in it (eg 20 slices of bread in a loaf).*

## **Activity 5**

### **Celebration Day Picnic**

- Decide on a type of food that you think would be appropriate for a picnic.
- Think about the ingredients needed to make the dish and where you could buy them.
- Use the catalogues to find the products that you need and purchase them, making sure you keep a list of where you purchased from and their individual prices.
- You are purchasing for a group of 90. Keep in mind, that everything you purchase needs to be paid for by you and your grade members.

#### Reflection:

- What Maths was used in this activity?
- Explain how you came to work out how much each student needs to pay.

*This picnic was a Celebration of the hard work that 4J, 4A and 4K had done during the previous term.*

*4A went to Nurragingy to find the perfect 'picnic area'. On the day, they took all Year 4 and our guests (ATSI parents who helped during the program) to the picnic area that was going to best suit our needs for our picnic.*

*4J used budgeting and purchasing to work out a menu, to a budget, for the day. We collected the money together and prepared the food for all of Year 4 and our guests.*

*4K looked at Mathematics in Aboriginal Art, and that had little bearing on a picnic, but they, of course, came with us to celebrate all the work that they had done.*