

# Introduction

## PATTERNS, COUNTING, MEASURES

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### *Preparing my unit*

*After talking with some elders during the information gathering phase of the MACIMISE project, I picked the necklace (fig. 2), finger span (fig 3), and finger joint (fig 1) as a cultural means to help students understand mathematics.*

*The reasons for picking these “ethnos or cultural artifacts” (D’Ambrosio, cited by Rosa and Orey, 2011) is because they are significant in Marshallese culture:*

*A necklace is used during special occasion to show beauty or to present as a gift (Willie Mwekto, age 75)*

*The choice of length of a necklace and pattern on a necklace depends on the creator (Juslina Latrik, age 51)*

*In the old days there were no western measurement tools so Marshallese people were using body parts such as finger span, hand span, and finger joint to measure (Juslina Latrik, age 51).*

*Because the purpose of each lesson plan is for the students to learn how to count up to 10 and to learn the use of numbers up to 10 while experiencing traditional artifacts, each lesson was designed in sequential manner in-order for the purpose to be met. Later students are introduced to initial measurement ideas using a traditional unit.*

*For example, instead of asking the students to create a pattern in the first lesson, the students are given a chance to discover their own ability in creating a necklace and count up to 10, thus, the second lesson up to fifth lesson are complemented.*

*While the second, third, fourth, and fifth lessons are used to maintain the skills, knowledge, and concepts introduced previously starting with the first lesson, new skills, knowledge, and concepts are introduced in each lesson moving forward consecutively starting with the second, the third, the fourth, and the fifth. In short, each lesson reinforces earlier lessons and is introduced by the previous lesson.*

# Unit Overview

## PATTERNS, COUNTING, MEASURES

### Enduring Understandings

Possibility and usefulness of being able to count in ones.  
Need for measuring things  
traditional measuring units exist and have a history

### Knowledge

Traditional units of length in mat-making: *jetan*, *makoj*, *nene*, *ba*  
Cultural awareness, specifically how to prepare real materials (from pandanus leaves) and processes for weaving and designing patterns

### Skills

Making repeating patterns  
comparing lengths  
Making representations to show use of counting from 1 to 1

### Learning Strategies

Exploring and discovering,  
Modeling and observing,  
Participating in a group

### Rationale

Young children like collecting things to make handicrafts. Making necklaces out of shells gives an opportunity for children to sort, count, and compare collections of shells, create and describe patterns, and compare lengths.

### Goals

Students will be able to create patterns, count up to 10 and measure with a traditional unit

### Essential Questions

**Can students accurately count a collection of up to 20 objects?**  
**Can students recognize and create patterns?**

### Background to this Unit

Cultural artifacts are significant in Marshallese culture and can be used to learn mathematical principles. A necklace is used during special occasions to show beauty or to present as a gift. To create the patterns for a necklace, students will use count items like shells, recognize patterns and use traditional measurements, for example, measuring with body parts such as the finger span, hand span, and finger joint.

### Assessment

The teacher observes students' participation, process and progress as they develop and apply specific skills and knowledge. The teacher asks specific questions to confirm learning and assigns writing and initiates conversations to support learning process (e.g., reflection, knowledge).

# Lesson One

## THE NECKLACE STORY

### Focus

Listening to the “The Magic Necklace” story

### Objectives: *Students will*

become familiar with Marshallese names of objects in the story: marmar (necklace) and all (shells)

### Materials Needed

None required

### Teacher Activities

1.1. Read the story to the students in Marshallese.  
Pause periodically to ask questions so students comprehend the story  
See sample questions and answers below.

### Student Activities

1.1. *Listen to the story.*  
*Answer questions.*  
*Ask questions.*

### **Sample Questions [and Answers]**

What happened to the turtle?

**[It was stranded on the beach.]**

What did the turtle give to the boy?

**[A magic necklace...]**

Why did the turtle give the boy the magic necklace?

**[Because the boy helped the turtle get back into the water.]**

1.2. Re-read the story and lead a discussion.

1.2. *Answer questions and engage in discussion.*

# Lesson Two

## COUNTING TO 10 IN MARSHALLESE

### Focus

Counting items  
Identifying and saying  
numbers names

### Objectives: *Students will*

- count to ten in Marshallese
- successfully identify the names of shells
- thread shells into a necklace

### Materials Needed

Number cards  
Black and grey shells  
(packaged for students)  
Nylon thread or fine string

### Teacher Activities

2.1. Remind students about the Magic Necklace story.  
Ask why someone would give a necklace (e.g., to show appreciation).

2.2. Pass out bags containing *monaknak* (black) and *mouj* (grey) *allu* (shells), at least 10 of each color.

Ask students to take a handful of *allu* from the bag.

Have students count to answer these questions:

- “How many *allu* do you have?”
- “How many *allu* were *monaknak*?”
- “How many *allu* were *mouj*?”

2.3. Choose a number card and show the students. Have students display that number of *allu*.

Have students take a handful of *allu* from the bag, count them, and choose the number card that corresponds to the number of shells.

2.4. Direct students to make a necklace using all the *allu*.

2.5. Have students show each other the finished necklaces.  
Collect necklaces and make a class display for later use.

### Student Activities

2.1. *Listen and discuss.*

2.2. *Work with the shells, counting out loud to show awareness of number words in Marshallese:*

*juon, ruo, jilu, emen,  
lalim, jiljino, jiljimjuon,  
rualitok, ruatimjuon,  
jonoul*

2.3. *Identify the correct number card that represents the number of allu.*

*Continue to work with allu and the number cards.*

2.4. *Create a necklace with the allu.*

2.5. *Show the necklaces.*

# Lesson Three

## COUNTING WITH NECKLACES

### Focus

Patterns

### Objectives: Students will

- create a pattern.
- describe a given pattern using appropriate vocabulary.

### Materials Needed

Necklaces from lesson two  
Paper and pencils or crayons

### Teacher Activities

3.1. Introduce the English word “pattern”.

Give the Marshallese words for the idea of a pattern: *jokjok*, *wawein* and explain these words.

Invite students into an exploratory discussion.

#### Sample Discussion

Ask why there are two words.

Help them discover that they are used differently in different situations.

Provide examples, e.g., begin lining children up so you have boy/girl, boy/girl, boy - stopping at points

Ask the children who comes next, explaining how this is a pattern.

3.2. Ask students to untie one of the necklaces made in lesson two.

Direct students to create a pattern using at least 10 *allu*.

Circulate and ask each one to describe his or her pattern.

Repeat this activity two more times.

3.3. Write a number pattern (e.g., 1 3 1 3 1 3 1 ...) on the board.

Ask students (in groups) to use *allu* and show this pattern.

3.4. Ask students to draw the pattern with pencils or crayons.

3.5 Ask students to name the Marshallese words for “pattern.”

Check their knowledge of the color words for the *allu*.

Invite discussion about the patterns they observed.

### Student Activities

3.1. Listen and ask questions.

Discuss and respond to questions and follow teacher directions.

3.2. Create and describe patterns.

3.3. Work in groups to model the number pattern with *allu*.

3.4. Use Marshallese pattern words.

3.5. Name color words.

Give more examples of patterns, e.g., going up and down/left to right.

# Lesson Four

## PATTERNS FOR A NECKLACE

### Focus

Patterns  
Descriptions

### Objectives: *Students will*

- describe given patterns.
- thread a patterned necklace.

### Materials Needed

Allu from previous lesson  
Nylon thread  
Cards or paper and pencils for recording number patterns

### Teacher Activities

4.1. Review patterns by asking for Marshallese words for the English word “pattern.” Discuss.

Ask students to line up to act out a new pattern e.g., 1 boy, 2 girls, 1 boy, 2 girls...

4.2. Put students into pairs.

Direct each pair to make one necklace together.

Ask them to choose a number pattern and write the pattern on paper before they make the necklace.

Ask them to check their pattern and talk about it when they finish.

4.3. Invite pairs to show their necklaces.

Ask class members to describe the pattern used in each necklace.

### Student Activities

4.1. *Discuss, ask questions, and respond to teacher directions.*

4.2. *Decide on a pattern with the partner.*

*Write the pattern in numbers on paper.*

4.3. *Show the necklace and challenge class members to describe it.*

*Determine patterns of each group.*

# Lesson Five

## USING MARSHALLESE UNITS

### Focus

Using Marshallese to name and compare

### Objectives: Students will

- use Marshallese terms for the English words longer (*aetoklok*), longest (*aetok tata*), shorter (*kadulok*), shortest (*kadu tata*).
- identify and name compared lengths.
- learn and use Marshallese units of length: *jeton*, *nene*, *make*.

### Materials Needed

Necklaces made previously  
String for measuring

### Teacher Activities

5.1. Ask students to recall activities of previous lessons.

5.2. Untie and hold up two of the necklaces made in a previous lesson.

Ask questions:

- How are they the same? How are they different? (guide students to consider size or length)
- What words do we use to talk about different sizes? (help students use Marshallese and English words)

5.3. Invite students to choose two necklaces and compare their lengths.

Guide them to describe the differences (longer/shorter).

Repeat with various pairs of necklaces.

5.4. Introduce a third necklace.

Invite students to compare them, using English and Marshallese words for *longer* and *longest* and *shorter* and *shortest*.

Have students practice with several different sets of necklaces.

### Student Activities

5.1. Respond to comments.

5.2. Respond to questions by the teacher, using English or Marshallese words for long, short, longer, shorter, longest, shortest.

5.3. Make comparisons between two necklaces and speak the words clearly in Marshallese or English.

5.4. Make comparisons between three necklaces.

Describe and talk about how the necklace lengths compare.

### Marshallese Units Based on Parts of the Body

**Jetan:** beginning from the tip of a thumb finger and going down to the tip of the middle finger in the same hand. When measuring, we straighten these fingers out flat on something (palm face down) to measure the length of its circumference or area span.

**Makoj:** beginning from the tip of the middle finger to the first line or from line to line of the same finger. The middle finger has three lines which both are separated by three **makoj** sections.

**Nene:** beginning from the tip of a thumb finger to the tip of the opposite thumb finger. We straighten out both arms to make a position of 120 degrees. This measuring unit begins from tip-to-tip of thumb fingers in both hands.

### Teacher Activities

5.5. Introduce the words for parts of the body used to measure length in Marshallese. See above for three options.

Cut three pieces of string, one for each measurement, and measure the various necklaces.

### Plenary for Unit: Counting and Patterns

Revisit the language used in the lesson.

Call on students to demonstrate their ability to correctly use the words (Marshallese and/or English).

### Student Activities

5.5. *Listen and observe.*

*Make comments and ask questions.*

*Match words to their own bodies.*

*Respond to the teacher's questions and prompts.*

*Use the vocabulary learned.*

