# Mathletics

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# LESSON PLANS: AUSTRALIA

## Contents

# LESSON PLANS: AUSTRALIA

## Year 1: Number

### 45 MINS

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**Strand:** Number and Algebra

**Substrand:** Number and Place Value

**Outcome:**
- Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts. (ACMNA015)

## Introduction to Lesson          10 MINS

**Teacher Background:**

Play video from "Lady Bug Crawl," located in

**Mathletics Teacher Console > eBooks.**

This will initiate the thought process based on a visual for computational learning. Pause during the questions asked in the video.

**Ask students for further extension:**
- Why was it more useful to move 2 lady bugs than just 1?
- Why was the total of 14 the same in both of your number sentences?
- Could you have predicted that? How would the number sentences have been alike and different if 6 lady bugs had crawled from the right to the left?

### ITEMS NEEDED
- ✔ Interactive whiteboard
- ✔ Mathletics teacher login
- ✔ Mathletics student logins
- ✔ Teacher notes from "Lady Bug Crawl"
- ✔ Student handout: Lady Bug Crawl

### ASSESSMENTS
- ✔ Observation
- ✔ Participation
- ✔ Reviewing completed Lady Bug Crawl student worksheet.

### ACCOMMODATIONS/ MODIFICATIONS
- ✔ Concept search "number line for addition."
- ✔ Students who are having difficulty could be given smaller numbers or asked to find fewer combinations.
- ✔ Manipulatives

### EXTENSION OF LEARNING
- ✔ Problem Solving game
- ✔ Curriculum activities
- ✔ Live Mathletics Level 1–2

# LESSON PLANS: AUSTRALIA

## Year 1: Number

## The Lesson
### 🕐 30 MINS

**eBook: Lady Bug Crawl**

- Hand out the student sheet and have students complete the handout. Give students enough time to brainstorm as many number sentence as possible.

- Display Lady Bug Crawl interactive on interactive whiteboard. Have the students show/share the number sentences they created.

  **Prompt questions:**
    - How many lady bugs are on each leaf at the start?
    - At the end?
    - How did the two numbers you started with change?
    - Why couldn't both numbers increase?
    - Why couldn't both decrease?

- **Reinforcement:** Have the students complete curriculum activities in the Student Console. Go to Addition and Subtraction.
  Suggested activities are:
    - Adding to Ten
    - Adding to make 5 and 10
    - All about Ten
    - Adding to 10 Word Problems

- **Extra-time activity/cross-curriculum activity:** Have the students create as many of their own problems using construction paper with bugs or animals as the visual.

One
Two

**LADY BUG CRAWL**

Number

## After the lesson
### 🕐 5 MINS

- Have the students journal or share what was learned during this session.
- Ask students to be specific with their examples.
- Students can show/share some of the number sentences they created.
- Discuss what was hard/easy about creating number sentences.

# LESSON PLANS: AUSTRALIA

## Year 1: Patterns

### 45 MINS

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**Strand:** Number and Algebra

**Substrand:** Patterns and Algebra

**Outcome:**
• Investigate and describe number patterns formed by skip counting and patterns with objects. (ACMNA018)

## Introduction to Lesson — 10 MINS

**Teacher Background:**

On your interactive whiteboard, bring up Concept Search from your Teacher Console under the Demonstration tab. Search "Patterns" and click on the first slide. You will notice that there are a few slides in this visual. The screen can be maximized by clicking on the square and arrow icon located at the bottom right hand corner.

Display the first slide and ask the students what they are noticing.
- • What are the fruits creating?
- • What are the snap cubes creating?
- • How are they similar and how are they different?

The next slide shows the patterns with numbers; students can discuss how to complete the pattern. You can use a hundreds chart for prompting. The next two slides use snap cubes. Students can use snap cubes to create their own patterns or follow along with what is being displayed on the slide.

**Ask students for further extension:**
- • What other patterns can you create using snap cubes or whatever objects were displayed on the slides?
- • Do you see any patterns in the classroom?
- • What other objects, words, and/or numbers can you use to create patterns?

### ITEMS NEEDED
- ✔ Interactive whiteboard
- ✔ Mathletics teacher login
- ✔ Student Mathletics logins
- ✔ Student handouts from eBooks
- ✔ Classroom manipulatives
- ✔ Computers/tablets
- ✔ Maths journals (if implemented by teacher)

### ASSESSMENTS
- ✔ Observation
- ✔ Participation
- ✔ Reviewing completed worksheets or reviewing journaling responses (if implemented)
- ✔ Results from the curriculum activities within the Mathletics Teacher Console

### ACCOMMODATIONS/ MODIFICATIONS
- ✔ Allow students to access manipulatives to help create patterns.
- ✔ Encourage students to click on "Something Easier" and "Something Harder" within the Mathletics curriculum activities.

### EXTENSION OF LEARNING
- ✔ Complete any Problem Solving games students haven't worked on.
- ✔ Curriculum activities
- ✔ Explore Rainforest Maths (Year 1) within Mathletics.

## The Lesson

🕐 **30 MINS**

### Centres

- **Background for teacher—**You can add more centres to the ones indicated below. For the eBook centre, please review which pages you would like the students to complete. Depending on how much work students can get done with each centre, centre rotation can be about every 10 minutes. Groups will vary depending on class size.



- o **Centre 1:** Problem Solving—On the interactive whiteboard, bring up a Problem Solving game from the Demonstrations tab within the Teacher Console. Options are located under Problem Solving and then under Patterns. Have the students work in either a group or pairs to solve the problems. To reinforce their understanding, students record ways they solved the problems in their own journals.

- o **Centre 2:** Computers/tablets—Students are to work in their Student Console to complete Pattern curriculum activities. These activities are located in the Student Console under "Patterns and Algebra." Recommended activities: Simple Patterns, Colour Patterns.

- o **Centre 3:** eBooks—Students are to complete the pre-selected pages. Teachers can place manipulatives to help support various learning styles. Students should pair up and complete the partner activities please refer to pages 5, 7, 11, 14, 16, 20, 22, 25 or 27.

- **Extra-time activity/cross-curriculum activity:** Have the students create an acrostic poem with the word "Pattern."

## After the lesson

🕐 **5 MINS**

- Have the students discuss some of the patterns they came across.
- What are the different attributes used to create patterns?
- What are some of the strategies they used to solve a problem or complete a pattern?
- Have the students go home and look for patterns in their home or community.

# LESSON PLANS: AUSTRALIA

## Year 1: Measurement and Geometry

🕐 **45-50 MINS**

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**Strand:** Measurement and Geometry

**Substrand:** Using units of measurement

**Outcome:**
- Measure and compare the lengths and capacities of pairs of objects using uniform informal units. (ACMMG019)

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## Introduction to Lesson     🕐 10-15 MINS

**Teacher Background:**

On the interactive whiteboard, bring up **Concept Search** from the

> **Mathletics Teacher Console > Demonstrations > Concept Search**

Click on **Animated Maths Dictionary**. Enter the term Measure in the Word Search bar. Have a class discussion on things that the students might measure.

Within the Mathletics Teacher Console,

> **Demonstrations > Concept Search > Concept Search**

Search for "comparing length". You will notice that there are a few slides in this visual. Slides can be maximized by clicking on the square and arrow icon located at the bottom right hand corner.

**Display the first slide and ask the students what they notice:**
- Which one is longer?
- How do you know?
- Is there something on/in your desk you can compare?

The next slide allows students to explore the classroom for objects. Have the students collect their information and then share it with the class.

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📚 **ITEMS NEEDED**
- ✔ Interactive whiteboard
- ✔ Mathletics teacher login
- ✔ Mathletics student logins
- ✔ Measuring tools
- ✔ Computers/tablets
- ✔ Maths journals (if implemented by teacher)
- ✔ Manipulatives

🖥 **ASSESSMENTS**
- ✔ Observation
- ✔ Participation
- ✔ Reports from the curriculum activities within the Mathletics Teacher Console.
- ✔ Measurement assessment within Mathletics Student Console.

⚙ **ACCOMMODATIONS/ MODIFICATIONS**
- ✔ Encourage students to click on "Something Easier" and "Something Harder" within the Mathletics curriculum activities.
- ✔ Provide students with manipulatives.

📜 **EXTENSION OF LEARNING**
- ✔ Game under Problem Solving > Balance.
- ✔ Curriculum activities.
- ✔ eBooks: students complete set pages.

## The Lesson

🕐 30 MINS

### Rainforest Maths

- On your interactive whiteboard, click on the Demonstrations tab within the Mathletics Teacher Console. Click on the Rainforest Maths icon. Click on Year 1 and start off with the "Length" game.

- The game will display bugs and how long they are using various objects. Display the first picture and have the students guess how many paper clips long the bug is. Students can write down their answers on paper. Have a student come up and drag the paper clips to find the answers. Discuss what their answers were and how they determined that number and what strategies they used.

- You can carry on with other bugs by clicking on the "More" bug at the bottom right corner. This activity can be continued as a teacher-led activity, or students can work in pairs on computers to complete it.

- **Reinforcement:** Computers/tablets—Have the students complete curriculum activities in the Student Console. Go to Units of Measurement

  Suggested activities:
  - Everyday Length
  - Comparing Length
  - Filling Fast!
  - Measuring Length with Blocks
  - Compare Length

- **Extra-time activity/cross-curriculum activity:** Pick an object in the school—it could be something in the hallway, schoolyard, or principal's office. Have the students decide on a measurement tool such as counters, snap cubes, or paper clips. Discuss with students some strategies for choosing the correct measurement tool for the item they want to measure. For example, if they want to measure a canteen window, would they use counters, pencils or their hands? Have the student predict the length and then confirm it. Students can record this in their maths journals.

## After the lesson

🕐 5 MINS

- Discuss some of the items they measured and what tools they used.
- What objects were harder to measure (straight vs. round objects)?
- Have the student go home and measure the height of a parent, guardian, or sibling using non-standard measuring items such as paper clips, pencils, erasers, etc.

# LESSON PLANS: AUSTRALIA

## Year 2: Number

### ⏱ 45 MINS

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**Strand:** Number and Algebra

**Substrand:** Number and Place Value

**Outcome:**
- Solve simple addition and subtraction problems using a range of efficient mental and written strategies. (ACMNA030)

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## Introduction to Lesson          ⏱ 10 MINS

**Teacher Background:**

Review the teacher notes from the Dr. Small eBook. This is located in the

**Teacher Console > eBooks > Year 2 > 3 Ribbons**

After clicking on the eBook, options will show up on the far right; click on the Teacher Notes.

Play video from "3 Ribbons" on your interactive whiteboard for the students. The video is located in the Mathletics Teacher Console under eBooks. This will initiate the thought process for computational learning based on a visual. This is to start a discussion but not to solve the question. Students will have the opportunity to solve the question during the lesson.

**For further extension, students should start thinking about how they can solve the problem:**
- Do you think that the shortest ribbon could be 80 cm long? Why or why not?
- Do you think that the longest ribbon could be 50 cm long? Why or why not?
- Could one ribbon be 5 cm long? Why or why not?
- Could one ribbon be twice as long as another?
- What strategy did you use to come up with solutions?
- Is there another way to work out the answer?

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### 📚 ITEMS NEEDED
- ✔ Interactive whiteboard
- ✔ Mathletics teacher login
- ✔ Teacher notes from "3 Ribbons"
- ✔ Student handout: "3 Ribbons"
- ✔ Maths journals (if implemented by teacher)
- ✔ Computers/mobile devices

### 🔍 ASSESSMENTS
- ✔ Observation
- ✔ Participation
- ✔ Reviewing completed "3 Ribbons" student worksheet
- ✔ Reporting results within the Teacher Console of Mathletics for curriculum and Live Mathletics results

### ⚙ ACCOMMODATIONS/ MODIFICATIONS
- ✔ Provide students with ribbons for manipulative.
- ✔ Encourage students to click on "Something Easier" and "Something Harder" within the Mathletics curriculum activities.

### 📜 EXTENSION OF LEARNING
- ✔ Problem Solving game under Subtraction
- ✔ Curriculum activities
- ✔ Live Mathletics Level 1–2

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## The Lesson
🕐 **30 MINS**

### eBook: 3 Ribbons

- Display the "3 Ribbons" eBook on the interactive whiteboard. Within the eBook, click on the interactive on the far right. Click on the "See Question" tab. Discuss some strategies students can use to solve the problem. Teachers can access Problem Solving strategies under eBooks, Problem Solving tab on the far right. Once you click on the Problem Solving tab, there will be three books to choose from. For year 2, click on the Level 1 Problem Solving booklet.

- The strategies discussed in the Problem Solving eBook are; Read, plan, work and check, Draw a diagram, Look for patterns, Act it out, Trial and error, Make a list, Estimation, Work backwards, and Open ended. Discuss strategies with students and allow them to work in groups/pairs to solve the problem.

- **Reinforcement:** Using computers or mobile devices, students complete curriculum activities in the Student Console. Go to Addition and Subtraction.

    **Suggested activities:**
    - Addictive Addition
    - Simple Subtraction
    - Repartition to Subtract

- **Extra-time activity/cross-curriculum activity:** Mystery Number. Pick a two-digit number and create hints for classmates to figure out the number. Have the students create a poster displaying hints on what the number could be. Encourage students to use number sentences, pictures, or words. Teachers can implement rules such as, a minimum of 4 hints, you cannot use any numbers from your mystery number, has to be at least a 2-digit number, etc.

## After the lesson
🕐 **5 MINS**

- Have the students reflect in their journals about the lesson.
- What strategies did they use?
- Which ones did they find to be helpful in solving this problem?
- Or create a "What stuck with you today?" board.
- Students write their responses on sticky notes and place them on this board. These sticky notes can be reviewed with the class at the end of the week.

# LESSON PLANS: AUSTRALIA

## Year 2: Patterns

**45 MINS**

**Strand:** Number and Algebra

**Substrand:** Patterns and Algebra

**Outcome:**
- Describe patterns with numbers and identify missing elements. (ACMNA035)

### Introduction to Lesson — 10 MINS

Ask students when something is balanced and unbalanced.

Prompt questions about a scale with weighed objects. Then have the class discuss what they think/know about the terms equal and inequality. Display this on a whiteboard/poster paper.

On the interactive whiteboard, bring up

**Mathletics Teacher Console > Demonstrations > Concept Search.**

Search Equal and Unequal. The slides will display the definitions and symbols and give examples. Have the students brainstorm items they could use these symbols for, or where they have seen these before.

Display examples on the board and have students figure out which symbol to use.

### ITEMS NEEDED
- ✔ Interactive whiteboard
- ✔ Mathletics teacher login
- ✔ Mathletics student logins
- ✔ Student handouts from eBooks
- ✔ Problem solving page
- ✔ Classroom manipulatives
- ✔ Computers/tablets
- ✔ Maths journals (if implemented by teacher)

### ASSESSMENTS
- ✔ Observation and participation
- ✔ reviewing completed worksheets or review journaling responses
- ✔ Results and reports from the Mathletics teacher console

### ACCOMMODATIONS/ MODIFICATIONS
- ✔ Allow students to access manipulatives to help create patterns.
- ✔ Create mixed ability groups
- ✔ eBook pages from higher or lower grades.

### EXTENSION OF LEARNING
- ✔ Problem solving games
- ✔ Curriculum activities
- ✔ Explore Rainforest Maths
- ✔ Live Mathletics

## The Lesson | 🕐 30 MINS

- **Discover:** Hand out Problem Solving worksheet from eBooks. This is located in

  **Teacher Console > eBooks > Problem Solving > Level 1**.

  The worksheet is located under "Open-ended" worksheet 6. This worksheet will allow students to solve a problem based on the scale being balanced/equal. Have students record their answers. Open class discussion about answers and strategies.

  **Extension questions:**
  - What if we wanted to make the scale unbalanced or unequal?
  - What if we doubled the pile of books? What pile of books can be added to balance it now?
  - Can you create this problem only using numbers?
  - What would that look like?
  - What symbols can we use while solving this problem?

  Ask students to flip the page over and create their own problem using pictures. The answer can be either equal or unequal.
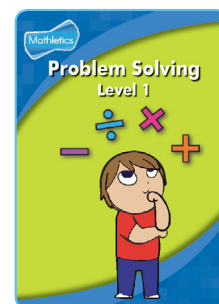
- **Explore:** Mathletics—Students can explore within Mathletics. They should focus on Rainforest Maths, Years 2 and 3, Algebra; Concept Search, Problem Solving and Balance.

- **Reinforcement:** eBooks—Students are to complete the pre-selected pages. Teacher can place manipulatives to help support various learning styles. Recommended pages: Year 2/Patterns and Relationships, pages 18–25 and Year 3/Patterns and Relationships, pages 13-18.

- **Extra-time activity/cross-curriculum activity**: Students can create their own balance scale. This is created with a hanger, placing a cup attached to string on each end of the hanger. Students can compare various objects in the classroom and record what is equal and unequal. They should record their number sentences using the correct symbols.

## After the lesson | 🕐 5 MINS

- Review the symbols for equal and unequal. What strategies did students use?
- How can they use these symbols with numbers, words, pictures, and sounds?
- Have the students play a game of Live Mathletics and compare their game to the previous game.

# LESSON PLANS: AUSTRALIA

## Year 2: 3D Objects

### 45 MINS

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**Strand:** Measurement and Geometry

**Substrand:** Shape

**Outcome:**
- Describe the features of three-dimensional objects. (ACMMG043)

## Introduction to Lesson — 10 MINS

**Teacher Background:**

Prompt the question to your students, "What does three dimensional mean?" This will allow students to share their prior knowledge. You can also have students fill out a KWL chart for further extension.
On your interactive whiteboard, go to

  Mathletics Teacher Console > Demonstrations > Concept Search.

Click on **Animated Maths Dictionary** and search Three Dimensional. Discuss with students the definition and the picture that is displayed. Click back on **Concept Search** within the Demonstrations tab and click on the icon **Concept Search**. Search 3D objects in the **Search** field on the top left side. It will bring up a few different slides. Click on the first slide displaying multiple objects. There are ten slides here and not all will apply to the lesson (The applicable slides are 2, 3, 5, and 7.). As a further extension activity, teachers can search each object in the search field.

**Ask students for further extension:**
- What objects in the classroom have the same shape?
- How are these shapes similar or different?
- Why do you think these are 3D shapes?
- How are they different from 2D shapes?
- What could these shapes be used for (buildings, household products)?

## ITEMS NEEDED
- Interactive whiteboard
- Mathletics teacher login
- Mathletics student logins
- eBook student pages from Year 2/ Space and Shape
- Shape manipulatives
- Maths journals (if implemented by teacher)
- Computers/mobile devices.

## ASSESSMENTS
- Observation and participation
- Reviewing completed student worksheet
- Results from the Mathletics curriculum activities, which is located under Reports in Teacher Console.
- Assessment from teacher eBook under Assessments: pages 44–49.

## ACCOMMODATIONS/ MODIFICATIONS
- Provide students with extra worksheets about 3D shapes from Year 1 Shape and Space or Year 3 Space, Shape and Position.
- Encourage students to click on "Something Easier" and "Something Harder" within the Mathletics curriculum activities.

## EXTENSION OF LEARNING
- Curriculum activities
- Explore more in Concept Search and Rainforest Maths.
- Students can record 3D objects they come across over the next couple of days.

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## The Lesson — ⏱ 30 MINS

### eBook: Space and Shape

• Go to **eBooks > Year 2 > Student Book > Space and Shape.** Refer to pages 18–19 and 24–25. Students will work on these pages with partners. The pages indicate the items needed along with shape manipulatives. After they complete the pages, have the student search the classroom for other objects they believe to be three dimensional. They can record these objects in their journals. If there is time, show and share with the class.

• **Reinforcement:** Computers/Tablets—Students complete curriculum activities in the Student Console. Go to Shape. Suggested activities: Collect the Objects and Relate Shapes and Solids; Rainforest Maths, Year 2, 3D objects. Students can explore several different options here, including a quiz they can complete with a partner.

• **Extra-time activity/cross-curriculum activity:** Creating Shapes— Students can create 3D objects using straws/toothpicks and play dough. They are to pick an object and create it using the materials provided. This can be conducted as an individual or partner activity.
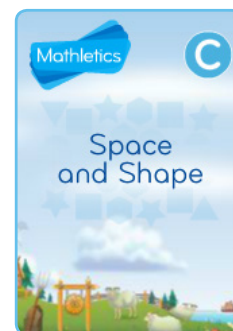
## After the lesson — ⏱ 5 MINS

• Show two different objects and ask the students how they are similar and how they are different. They can refer to some of the strategies they used while completing the activities earlier. Have the students indicate the name for each of the objects they came across today (cubes, spheres, cones, cylinders, pyramids).

• If students did not get a chance to complete the curriculum activities, they can be assigned for homework. This feature is under the Results tab within the Mathletics Teacher Console.

# LESSON PLANS: AUSTRALIA

## Year 2: Data

### 45-50 MINS

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**Strand:** Statistics and Probability

**Substrand:** Data representation and interpretation

**Outcome:**
- Identify a question of interest based on one categorical variable. Gather data relevant to the question. (ACMSP048)
- Collect, check and classify data. (ACMSP049)
- Create displays of data using lists, table and picture graphs and interpret them. (ACMSP050)

## Introduction to Lesson          10-15 MINS

**Teacher Background:**

Ask the class what their favourite school subject is. Collect some data and discuss ways this data can be displayed. Depending on the students' prior knowledge, they might say charts, graphs, a picture, tallies, or writing the data down using a sentence.

**Ask students what they think a pictograph is.**
- Why would it be used?
- What kind of information can it display?

On your interactive whiteboard, go to

**Teacher Console > Demonstrations > Concept Search > Animated Maths Dictionary.**

Search the term pictograph and discuss the definition. If students have individual journals or dictionaries, have them write down the definition.

On the interactive whiteboard, go to

**Teacher Console > Demonstrations > Concept Search > Concept Search.**

In the **Search** field, search Picture Graph. This will bring up an interactive slide. For the first side you can ask the class what items of fruit they have in their lunch boxes. Click on the name of each fruit and it will be displayed within the chart. After the data is collected, ask the students questions based on the data that was just collected.

### ITEMS NEEDED
- Interactive whiteboard
- Mathletics teacher login
- Mathletics student login
- Manipulatives
- Student handout from eBooks pages 14–16
- Maths journals (if implemented by teacher)
- Computers/mobile devices.

### ASSESSMENTS
- Observation
- Participation
- Reviewing completed worksheets.
- Reporting results within the Teacher Console of Mathletics for curriculum.
- Graphs created by the students
- Teacher assessments in the teacher eBook- Year 1 Chance and Data, page 29

### ACCOMMODATIONS/ MODIFICATIONS
- Create centre groups according to heterogeneous grouping.
- Encourage students to click on "Something Easier" and "Something Harder" within the Mathletics curriculum activities.
- Print out student worksheets from lower or higher grades.
- Provide various manipulatives.

### EXTENSION OF LEARNING
- Curriculum activities
- Extra worksheets from eBooks
- Rainforest Grade 1: Data
- Live Mathletics

## The Lesson ⏱ 30 MINS

### Centres

- **Background for teacher—**You can add more centres to the ones indicated below. For the eBook centre, please review which pages you would like the students to complete. Depending on how much work students can get done with each centre, centre rotation can be about every 10 minutes. Groups will vary depending on class size.

  o **Centre 1:** Computers/tablets—Students complete curriculum activities within the student Mathletics site. Suggested activities under Chance and Data are: Make Graphs, Sorting Data and Reading from a Column Graph.

  o **Centre 2:** eBooks—page 14–16 in the Year 1 Chance and Data student booklet. Student can work in pairs or complete individually.

  o **Centre 3:** Creating a Graph—Students create their own question and collect their data within the classroom. Students then can display the data with manipulatives provided by the teacher. This centre is for the construction of concrete graphs. If students need help with a model, have them click on Concept Search within their Student Console and search Picture Graph. Students are encouraged to collect data based on Mathletics. Questions could be around there favorite part in Mathletics: the items they like to buy with their credits, the certificates they earned, and so forth.

- **Extra-time activity/cross-curriculum activity:** Collect Mathletics certificate data. Have the students collect the Mathletics certificates they earned. Brainstorm as a class, the best way to display this data in the classroom. Students can create their own pictures of the certificates they earned and place them on the classroom chart. This chart can be updated throughout the year!

## After the lesson ⏱ 5 MINS

- Have the students share with a partner sitting beside them what they learned today. Have them discuss key concepts, such as how they collected the data, what a pictograph is, how they created their graphs, did they find anything interesting in the data, and so forth.

- Teachers can also close the lesson with the one-page assessment located in
  **eBooks > Year 1 > Chance and Data > page 29**.

# LESSON PLANS: AUSTRALIA

## Year 2: Multiplication

### 45 MINS

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**Strand:** Number and Algebra

**Substrand:** Number and Place Value

**Outcome:**
• Recognise and represent multiplication as repeated addition, groups and arrays. (ACMNA031)

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## Introduction to Lesson          10 MINS

**Teacher Background:**

Review the teacher notes from eBooks "Build a Number" located in

Mathletics Teacher Console > eBooks > Year 3 > Build a Number.

Click on the eBook and options will show up on the far right. Click on the Teacher Notes.

Play video from "Build a Number" on your interactive whiteboard for the students.

During the video, pause and discussed the key words that are underline in red. If students are not aware of the fraction 1/4, please clarify. This is to start a discussion but not to solve the question. Students will have the opportunity to solve the question during the lesson.

**Ask students for further extension to get them to start thinking about how they can solve the problem:**
• Were you free to choose the number of flats?
• How about the number of longs?
• Why did the number of longs have to be even?
• What did you notice about the number of unit blocks?

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### ITEMS NEEDED
✔ Interactive whiteboard
✔ Mathletics teacher login
✔ Teacher notes from "Build a Number"
✔ Base ten blocks
✔ Student handout for "Build a Number"
✔ Maths journals (if implemented by teacher)
✔ Computers/mobile devices
✔ Dice

### ASSESSMENTS
✔ Observation and participation
✔ Reviewing completed "Build a Number" student worksheet
✔ Reporting results within the Teacher Console of Mathletics for curriculum

### ACCOMMODATIONS/ MODIFICATIONS
✔ Provide manipulatives.
✔ Encourage students to click on "Something Easier" and "Something Harder" within Mathletics curriculum activities.
✔ Teacher can work with a small group of students.

### EXTENSION OF LEARNING
✔ Rainforest Maths activities within Grade 3, Number
✔ Curriculum activities
✔ Live Mathletics Level 3–4

## The Lesson

🕐 **30 MINS**

### eBooks: Build a Number

- Provide students with the "Build a Number: student handout. Teachers can provide students with the base ten blocks sets as well. Have the students come up with as many possible solutions as they can. If students need help with ways to solve this problem, teachers can review the Problem Solving booklets within eBooks. The strategies discussed in the Problem Solving eBook are Read, plan, work and check; Draw a diagram; Look for patterns; Act it out; Trial and error; Make a list; Estimation; Work backwards; and Open ended.

- On the interactive whiteboard bring up the "Build a Number" interactive for the class by going to **Teacher Console > eBooks > Year 3 > Build a Number** and clicking on the interactive on the far right. The interactive will display the base ten blocks on the left side; double click on each one and it will be added to the center of the screen. Have the students come up and share some of the solutions they found, along with a strategy they used to solve this problem. As each group comes up and shares, click the "store" button, which will store the solutions on the right side. After all the groups have shared, review all the solutions.

- **Reinforcement:** Use computers or mobile devices. Students complete curriculum activities in the Student Console.
  Suggested activities in Multiplications are: Multiplication Arrays.
  Suggested activities in Division are: Fill the Jars.

- **Extra-time activity/cross-curriculum activity:** Number Cubes—Students can play a game using 2 or 3 dice. Students roll the dice and they decide what symbol they will use to add or multiply. They will display the answer using the base ten blocks and have the partner figure out what symbol they used. For example, a student rolls three dice and gets the number 3, 4, and 2. Students can add or multiply the numbers and display the total using the base ten blocks.



## After the lesson

🕐 **5 MINS**

- Have the students reflect in their journals about the lesson. What strategies did they use? Which ones did they find to be helpful to solve this problem? Or create a "What stuck with you today?" board.

- Students write their responses on sticky notes and place them on this board.

- Teachers can review these sticky notes at the end of the week and share the process/thoughts with the students.

# LESSON PLANS: AUSTRALIA

## Year 3: Patterns

🕐 **45 MINS**

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**Strand:** Number and Algebra

**Substrand:** Patterns and Algebra

**Outcome:**
- Describe, continue, and create number patterns resulting from performing addition or subtraction. (ACMNA060)

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### Introduction to Lesson 🕐 10 MINS

**Teacher Background:**

Provide students with manipulatives and ask them to create patterns. Ask, What kind of patterns can you create? Give students some time to create and discuss their patterns.

On the whiteboard, write down the term Increasing Patterns and ask what they think this might mean. How can we create increasing patterns or growing patterns? Create a pattern on the interactive whiteboard showing the first two figures and ask if they know how to find the next two figures.

**Challenge students by asking:**
- Are there other attributes we can use to create increasing patterns?
- How can we create increasing patterns with numbers? with sounds?
- Do you see any increasing patterns in the classroom?

---

### 📚 ITEMS NEEDED
- ✔ Interactive whiteboard
- ✔ Mathletics teacher login
- ✔ Student handouts from eBooks
- ✔ Student Mathletics logins
- ✔ Classroom manipulatives
- ✔ Computers/tablets
- ✔ Maths journals (if implemented by teacher)

### 📋 ASSESSMENTS
- ✔ Observation and participation
- ✔ Reviewing completed worksheets or reviewing journaling responses
- ✔ Group participation
- ✔ Curriculum activities results within Mathletics

### ⚙ ACCOMMODATIONS/ MODIFICATIONS
- ✔ Allow student to access manipulatives to help create patterns.
- ✔ Encourage students to click on "Something Easier" and "Something Harder" within Mathletics curriculum activities.
- ✔ eBooks from Year 2 or Year 4 for Patterns

### 📜 EXTENSION OF LEARNING
- ✔ Problem solving from the student Mathletics centre
- ✔ Curriculum activities
- ✔ Explore Rainforest Maths (Year 3, Patterns and Algebra) within Mathletics
- ✔ Students can play Live Mathletics.

## The Lesson　🕐 30 MINS

### Centres

- **Background for teacher—**You can add more centres to the ones indicated below. For the eBook centre, please review which pages you would like the students to complete. Depending on how much work students can get done with each centre, you can rotate about every 10 minutes. Groups will vary depending on class size.



　　o **Centre 1: Rainforest Maths**— On the interactive whiteboard, go to **Teacher Console > Demonstrations > Rainforest > Maths > Grade 3 > Algebra > Patterns > 10s; 100s; and other number patterns**. These show patterns using numbers. Have students take turns answering the questions on the whiteboard. Students record the questions and answers in their journals.

　　o **Centre 2: Computers/tablets**—Students are to work in their Mathletics Student Console to complete pattern curriculum activities. Suggested activities under Patterns and Algebra include: Count Forward Patterns, Count Back Patterns, Describing Patterns.

　　o **Centre 3: eBooks**—Students complete the pre-selected pages. Teachers can place manipulatives to help support various learning styles. Students can complete the recommended eBook pages, "Patterns and Algebra," pages 1–9, in pairs or individually.

- **Extra-time activity/cross-curriculum activity:** Things That Grow—Students create artwork of things that grow. Students can paint or use construction paper to display this artwork. They are to create a few stages of the thing, to show how it's growing. For example, a student can display the first stage of a flower growing without petals, the next image with 3 petals, the next image with 6 petals and so forth.

## After the lesson　🕐 5 MINS

- Discuss some of the patterns students came across during today's lesson. What are some strategies you used to help you solve the questions?
- Exit card: Have each student create an increasing body percussion pattern as they leave the room.

# LESSON PLANS: AUSTRALIA

## Year 3: 3D Objects

🕐 **45 MINS**

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**Strand:** Measurement and Geometry

**Substrand:** Shape

**Outcome:**
- Make models of three-dimensional objects and describe key features. (ACMMG063)

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## Introduction to Lesson    🕐 **10 MINS**

**Teacher Background:**

Recall prior information by having a class discussion about 3D objects and their characteristics. Questions to prompt prior learning, I am shaped like a soccer ball, or, I have a pointy top and I can roll. What am I? On the board write down faces, edges and vertices. Ask, Does anyone know what these words mean?

On the interactive whiteboard, bring up Concept Search, located under

**Teacher Console > Demonstrations > Concept Search > Concept Search.**

Click on Concept Search and search the words Edges, Faces, Vertex. Each slide will explain a definition along with pictures. Discuss while viewing all slides, or have students write down the definitions in the Math dictionaries.

**Questions to ask:**
- How are the shapes similar or different?
- What 2D shapes do you see in these objects?
- How can you describe a face, edge, or vertex to a partner?
- How many vertices, edges and faces does a sphere have? cylinder? cone?

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### 📚 ITEMS NEEDED
- ✔ Interactive whiteboard
- ✔ Mathletics teacher login
- ✔ Mathletics student logins
- ✔ eBook student pages from Year 3, Space and Shape
- ✔ Shape manipulatives/nets
- ✔ Maths journals (if implemented by teacher)
- ✔ Computers/mobile devices

### 🔍 ASSESSMENTS
- ✔ Observation and participation
- ✔ Reviewing completed student worksheets
- ✔ Results from the Mathletics curriculum activities, located under Reports in Teacher Console
- ✔ eBook assessment page 35 from teacher book

### ⚙ ACCOMMODATIONS/ MODIFICATIONS
- ✔ Provide students with manipulatives
- ✔ Provide students with extra worksheets from Year 2 or 4 Shape and Space; 3D shapes.
- ✔ Encourage students to click on "Something Easier" and "Something Harder" within the Mathletics curriculum activities.

### 📜 EXTENSION OF LEARNING
- ✔ Curriculum activities
- ✔ Explore more in Concept Search and Rainforest Maths
- ✔ Live Mathletics

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## The Lesson  🕐 30 MINS

### Rainforest Maths

- **Investigate:** "Rainforest Maths"—Students are to investigate further within "Rainforest Maths." Have students work with partners.
  - Teachers can encourage students to record their information in the maths journals.
  - Direct them to click on **Rainforest Maths > Grade 3 > 3D shapes.**
  - There are several options for them to explore. Students can review 3-D shapes first by clicking on the "3D" and "About" icons on the left side and then carrying on with the other areas.
  - After students have had time to explore, have them share the information they found with the class.

- **Apply:** eBooks—Have students complete the student pages within the **eBooks > Year 3 > Space and Shape.** Recommended pages are 14–24.

- **Reinforcement:** : Using computers or mobile devices. Students complete curriculum activities in the Student Console.

  Suggested activities in Space and Shape are:
  - Collect the Objects 2
  - How many faces?
  - How many edges?
  - How many corners?
  - What pyramid am I?
  - What prism am I?

- **Extra-time activity/cross-curriculum activity:** Nets—Students can create 3-D nets to further their extension. Students can label and record all the edges, faces, and vertices.

## After the lesson  🕐 5 MINS

- Hold up objects found in the classroom and have the students identify where the edges, vertices, and faces are. They can select one to draw and label.

- Have students bring in disposable objects from home that are three dimensional. Students will disassemble the boxes that were brought from home. This will allow students to view the structure of these objects and analyze the edges, faces, and vertices.

# LESSON PLANS: AUSTRALIA

## Year 3: Data

⏱ **45-50 MINS**

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**Strand:** Statistics and Probability

**Substrand:** Data representation and interpretation

**Outcome:**
- Identify questions or issues for categorical variables. Identify data sources and plan methods of data collection and recording. (ACMSP068)
- Collect data, organise into categories and create displays using lists, tables, picture graphs and simple column graphs, with and without the use of digital technologies. (ACMSP069)
- Interpret and compare data displays. (ACMSP070)

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### Introduction to Lesson ⏱ 10-15 MINS

**Teacher Background:**

This lesson will allow students to research, collect, record and share. Please have various resources for the students to explore along with their student Mathletics accounts.

If teachers have not introduced the term Data, the concept can be reviewed within the Demonstrations tab from the Teacher Console.

**Ask students:**
- What are some ways we can display data?
- How can we collect the data?
- What are some types of graphs?

The graphs the students are going to research are tally marks, charts, lists, bar graphs, and line plots. Have the students fill out a KWL chart before they start.

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### 📚 ITEMS NEEDED
- ✔ Interactive whiteboard
- ✔ Mathletics teacher login
- ✔ Mathletics student logins
- ✔ Classroom manipulatives
- ✔ Computers/tablets
- ✔ KWL chart handout
- ✔ Resources for students to explore
- ✔ Poster paper

### 📋 ASSESSMENTS
- ✔ Observation
- ✔ Participation
- ✔ Group work
- ✔ Completion of the research project
- ✔ Reviewing the KWL chart
- ✔ Extra assessments are within the teacher eBooks "Chance and Data" pages 26–32.

### ⚙ ACCOMMODATIONS/ MODIFICATIONS
- ✔ Create mixed ability groups and assign students with certain roles.
- ✔ Provide students with certain resources to limit research.
- ✔ Provide visual models of the graphs and questions.

### 📑 EXTENSION OF LEARNING
- ✔ eBooks for Year 3 "Chance and Data" pages 10–21.
- ✔ Curriculum activities
- ✔ Explore Rainforest Maths, Year 3: graphs.

## The Lesson  🕐 30-40 MINS

### Research

- **Background for teacher—**The first part of the lesson will introduce the graphs/charts that students will research. In the second part of the lesson, students will collect and create a chart based on the types researched.

- **Before starting the lesson:** Discuss ways students can display their research, such as posters, journals, pictures. For this project teachers can implement requirements for students: for example, they need to define all the charts, must have pictures, indicate what data is best represented in each chart. Students can work in pairs or groups.

  o For the research, students can explore within Mathletics Student Console. Encourage students to research in the Mathletics Student Console under **Concept Search** and **Animated Maths Dictionary**.

  o In the second part of the lesson, students collect data and represent that data in one of the charts they researched. They must create a question about Mathletics. For example What is your favorite parts of Mathletics? What is your favorite item to buy with credits? What countries have you played against in Live Mathletics? What Times Table Toons video do you like the most? What types of certificates have you earned?

  o Show and share after all charts and data are completed.

- **Reinforcement:** Student can work on curriculum activities within Mathletics.
  Suggested activities in Chance and Data are: Coloumn Graphs, Reading from a column graph.
  Suggested activities in "Something easier" are: Who has the Goods?, Sorting data.
  Suggested activities in "Something harder" are: Picture graphs, Making graphs.

- **Extra-time activity/cross-curriculum activity:** Provide each group of students with a bag or M&M's or Skittles. Have the students sort and display their data in the graph they think would work best.

- Ask students to devise some questions about the data, then swap the questions with their peers. For example, how many more red ones were there than green ones.

## After the lesson  🕐 5 MINS

- Discuss with students: What are some interesting facts they learned during their research? Do they have similarities or differences? Students can finish KWL chart.

**45 MINS**

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**Strand:** Number and Algebra

**Substrand:** Number and Place Value

**Outcome:**
• Investigate and use the properties of odd and even numbers. (ACMNA071)

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## Introduction to Lesson — 10-15 MINS

**Teacher Background:**

• On the interactive whiteboard, log in to your

**Teacher Console > Demonstrations.**

Search for "I am Thinking of a Number". Display this activity on interactive whiteboard. You can work through all 10 questions or as many as you see fit for your students.

**Ask students prompting questions:**
- What function are you using to determine the number?
- Is your number increasing or decreasing?
- If we were to make a pattern, what rule could we use?

• To build on students' knowledge, display the curriculum activities Increasing Patterns or Decreasing Patterns.

**Ask students:**
- What rule could be given to this pattern?
- How would you describe this pattern?
- What strategies could you use to help you determine the pattern?
- Students can use number lines, charts, or tables to help them determine the pattern rule.

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### ITEMS NEEDED
✔ Mathletics teacher login
✔ Interactive whiteboard
✔ Mathletics eBook handouts
✔ Hundreds charts
✔ Counters
✔ Marian Small handouts

### ASSESSMENTS
✔ Have students write out their reflections.
✔ Participation
✔ Collect and assess Marian Small handout.

### ACCOMMODATIONS/ MODIFICATIONS
✔ Teacher can choose to use the Interactive instead of the handout.
✔ Change number to skip count to determine easier or harder patterns.
✔ Encourage students to use hundreds charts or number lines for skip counting and determining pattern rules.

### EXTENSION OF LEARNING
✔ Curriculum activities. Suggested activities: Describing Patterns, Table of values, I am Thinking of a Number!, Increasing Patterns and Decreasing Patterns.
✔ Rainforest Maths, Year 4: Patterns.

## The Lesson

**30-35 MINS**

### eBook: Describing Patterns in a Hundreds Chart

• On the interactive whiteboard, log in to your **Teacher Console > eBooks > Year 4 > Patterns and Algebra > Patterns and Relationships > page 3**. Show students the hundreds chart. If you have a hundreds chart in the classroom, you could use this as well. **Ask students:** Can we skip count using a hundreds chart? What patterns can you see? Shade the numbers in as you skip count.

• Using the questions on page 3, skip count together using the hundreds chart. Students should look at the hundreds chart and investigate what patterns they see. Students can follow along using their own hundreds chart.
**Ask students:** What patterns can you begin to see? Are the patterns increasing or decreasing? Can you see other patterns beside horizontal ones? What could be the pattern rule? What could the next numbers in the pattern be? Look at all 4 hundreds charts and discuss how the patterns are similar and how they differ.

### Odd or Even Apex? Marian Small Video

• Play the Marian Small video through the Teacher Console by going to **eBooks > Year 4 > Odd or Even Apex? > Video.** Play the video once through from beginning to end, allowing students to formulate their own ideas. Play the video again, pausing to ask the prompting questions throughout the video. Allow students time to investigate in their groups and determine a pattern rule. **Ask students:** Why is it difficult to determine a pattern rule? What do we have to consider when creating a pattern rule? What happens if the 3 base numbers are changed? Discuss what strategies and reasoning students used and developed to determine their patterning rules.

### Marian Small Interactive/Handout

• Print the Marian Small student handout from the same eBook as above. Have students begin to work through their own patterns and write out their patterning rules. On the interactive whiteboard, the teacher can use the interactive problem with a guided maths group while others are working on the handouts, or can do a whole-class discussion and begin generating ideas before students do work independently.

## After the lesson

**5-10 MINS**

**Discussions Questions:** Teacher can use their own discretion and have a whole-group or table-group discussion. **Questions to discuss:** Where can you see number patterns in real life? Was the hundreds chart or the number pyramid an easier way to see a pattern? What did you do when you were trying to determine a pattern rule?

# LESSON PLANS: AUSTRALIA

## Year 4: Number and Algebra

🕐 **45 MINS**

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**Strand:** Number and Algebra

**Substrand:** Money and Financial Mathematics

**Outcome:**
- Solve problems involving purchases and the calculation of change to the nearest five cents with and without digital technologies. (ACMNA080)

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### Introduction to Lesson        🕐 10 MINS

**Teacher Background:**
- Log in to your

  **Teacher Console > Demonstrations > Concept Search.**

  Type Money into your **Search** bar. Other suggested words are: coins, cents, equivalent, and dollar. Review these words with students and add to your Maths Word Wall or maths journals.

- Play the Marian Small "Coin Count" video found in the

  **Teacher Console > eBooks > Year 4 > Marian Small's Coin Count > Video.**

  Pause during the video to explain each monetary value. Pause at the end of the video and have students come up with as many answers as they can in their table groups. Use the Teacher Notes for questions to prompt students.

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### 📚 ITEMS NEEDED
- ✔ Mathletics teacher login
- ✔ Interactive whiteboard
- ✔ Mathletics eBooks
- ✔ Marian Small's Coin Count eBook
- ✔ Dice
- ✔ Coin manipulatives
- ✔ Sample of real coins

### 🔍 ASSESSMENTS
- ✔ Participation and group work checklist

### ⚙ ACCOMMODATIONS/ MODIFICATIONS
- ✔ Change monetary values to accommodate various learners.
- ✔ Use as consoles for kinesthetic learners.
- ✔ Use ability groups and modify coin count problem to calculate change with easier or more difficult values

### 📋 EXTENSION OF LEARNING
- ✔ Mathletics eBook: Addition and Subtraction-Money worksheets
- ✔ Give students flyers from local grocery stores. Have students plan a meal (health) and determine how much that meal would cost. How many different ways could they pay for it?

# LESSON PLANS: AUSTRALIA

## Year 4: Number and Algebra

## The Lesson
🕐 30 MINS

### Coin Count Problem:
- Using the eBook Year 4: Marian Small's Coin Count. Display problem on interactive whiteboard. Sign into **Mathletics Teacher Console > Ebooks > Year 4 > Coin Count Ebook > Interactive Coin Count Problem.**
- Use printable problem with cut and paste coins for students to follow along.
- Have students work in partners or groups to solve the problem in as many ways as they can.
- Try changing the problem and have students determine a new answer. In the Teacher Notes, the Extension of Learning section has a new problem solving question to use.

### High Life Mathletics Problem Solving Game:
- Open "High Life" Mathletics problem solving game. Sign in to **Mathletics Teacher Console > Demonstrations > Problem Solving > Money > High Life.**
- Work through the Problem Solving activity together, calculating money and introducing change. Explain to students that when we pay for something we have to give money of a certain value (many different ways to represent) and then we receive change in return. Ask students: What coins or bills could we use to make this change? What if we only had coins and no bills? Suppose you have 4 x 20 cent pieces, how many 10 cent pieces would you need? How many 5 cent pieces? What is this worth?

### Calculate the Change:
- Use the Year 4 Mathletics eBbook "Addition and Subtraction." From Problem Solving Game, click home in top left hand corner **Ebooks > Year 4 > Addition and Subtraction.** Click on **Money Section > Page 40 and 41**. Print game sheets to give to students. Each partner/group will need two dice.
- Students roll the die and using the number they roll, they need to determine how much change would be given according to the problem. Winner has the most money at the end of the game.

## After the lesson
🕐 5 MINS

### Think, Pair, Share
- **Think** about how often we use money. When would we expect to receive change?
- **Pair** up with a person of the opposite sex.
- **Share** your real-life experience of using money.

🕐 **45 MINS**

**Strand:** Number and Algebra

**Substrand:** Number and Place Value

**Outcome:**
- Recognise, represent and order numbers to at least tens of thousands. (ACMNA072)
- Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems. (ACMNA073)

### Introduction to Lesson          🕐 10 MINS

**Teacher Background:**
- Give students base ten blocks and number lines for the activity. Students can create their own number lines for reference as well. Have students represent the number 0.5, 100, and 1000 in as many ways as possible.
- Students can use pictures, numbers, words, manipulatives, or examples of where they have seen or heard these numbers before. Students should think of real-life examples and as many ways to represent that number as they can.
- Log on to your

    **Teacher Console > Demonstrations > Concept Search.**

- Enter thousand in **Search** bar.
- Show students the place value chart and how to place a numerical value in the proper columns.
- Students can make their own place value charts to use for reference when completing the rest of this lesson.
- Using the arrow for the next slide over, students will be able to see a visual of how base ten blocks can make up a whole number.
- In **Concept Search**, explore decimal system with students to show them how whole numbers become decimal numbers.

📖 **ITEMS NEEDED**
- ✔ Interactive whiteboard
- ✔ Mathletics teacher login
- ✔ Student handouts from eBooks
- ✔ Computers/tablets
- ✔ Base ten blocks
- ✔ Place value charts
- ✔ Chart paper
- ✔ Markers
- ✔ Abacus (if used in the classroom)

📄 **ASSESSMENTS**
- ✔ Observations
- ✔ Collaborative/group work
- ✔ Oral presentation
- ✔ Collect and assess place value charts

⚙ **ACCOMMODATIONS/ MODIFICATIONS**
- ✔ Allow students to use their own place value chart and base ten blocks to help read and represent whole numbers.
- ✔ Pair students in ability or levelled groups.

📄 **EXTENSION OF LEARNING**
- ✔ Curriculum activities
- ✔ Year 6 eBook, "Reading and Understanding Whole Numbers," various sections.
- ✔ Year 6: Rainforest Maths, Numbers.
- ✔ Live Maths Level 6
- ✔ Have students look up "abacus" in the Concept Search section of their Student Console and interact with this concept.

## The Lesson
### 35 MINS

**Teacher Background:**

Students should have created their own place value charts prior to this lesson, or they should be given a handout of a place value sheet.

**eBooks—Read and Understand Numbers (Ordering)**

- For this maths game, students will each need a printed handout from **eBook > Year 6 > Reading and Understanding Whole Numbers,** Read and understand numbers section, page 6, question 3. A copy should be made for every student. Students should be placed in or choose a group of four for this activity.

- Every student will need a set of the digit cards. Students can practice making the largest numbers they can. As an extension to this activity, have students place their numbered cards in their place value charts. Students should say the word aloud to obtain the points.
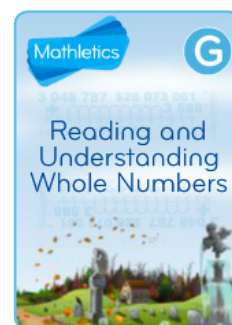
**Open-Ended Problem Solving—Some Really Big Numbers**

- **Option 1**—Display the problem solving questions, one at a time, on the interactive whiteboard. Log in to your **Teacher Console > eBooks > Problem Solving > Problem Solving Level 3 > Open-ended problem solving > Some really big numbers.**

- Have students work collaboratively to determine a solution to the problems. Students should write the number in their place value charts. Students should write in words the whole number. Students can then try the real-life problem and begin determining strategies to find a solution.

- **Option 2**—Using the same activity as above, print out the handout from the Problem Solving eBook and distribute to partners. Students should work on one of the three open-ended problem solving questions. Partners should show their work for each problem, writing the whole number in both words and numerically. Have students write their responses on chart paper and share with the class.
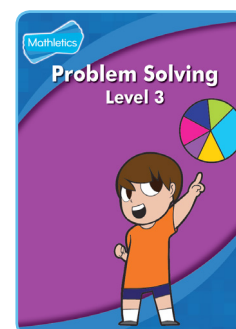
## After the lesson
### 5 MINS

- **3, 2, 1**
  **How It Works:** 3 things you have learned, 2 things you have questions about, 1 thing you want the teacher to know. Students can share their 3, 2, 1 response orally, through discussion, or you can provide an exit slip (sticky note) and have students post these before the class ends.

# LESSON PLANS: AUSTRALIA
## Year 4: Number and Algebra
### Using Pattern Blocks to Teach Fractions

🕐 **45 MINS**

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**Strand:** Number and Algebra

**Substrand:** Fractions and Decimals

**Outcome:**
- Investigate equivalent fractions used in contexts. (ACMNA077)

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### Introduction to Lesson          🕐 10 MINS

**Teacher Background:**

- Play Dr. Marian Small's "Pattern Blocks" video to introduce pattern blocks and discussion around fractions.
  Log in to

  > Teacher Console > eBooks > Year 5 >
  > Marian Small's Pattern Blocks #1.

  Click on the Pattern Blocks #1 video. Pause during the questions asked in the video. Discuss various responses.

- Hand out pattern blocks to students, as a manipulative to help them begin thinking about how they could create a shape that is one half yellow. Display pattern blocks in **Concept Search** for an added visual.

- In your Teacher Console, click on **Demonstrations > Concept Search** and enter pattern blocks in the **Search** bar. Have students begin to manipulate the blocks and create different fractional numbers.

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📚 **ITEMS NEEDED**
- ✔ Interactive whiteboard
- ✔ Mathletics teacher login
- ✔ Marian Small's printed student problems
- ✔ Pattern block manipulatives
- ✔ Laptops

🔍 **ASSESSMENTS**
- ✔ Observation of students working together to create fractions
- ✔ Participation in interactive
- ✔ Fraction art

⚙ **ACCOMMODATIONS/ MODIFICATIONS**
- ✔ Can practice easier/harder activities
- ✔ Can use Rainforest Maths at a level below or above

📑 **EXTENSION OF LEARNING**
- ✔ Search number lines and/or fractions in Concept Search. Show students how to use a number line to represent and compare fractional amounts.
- ✔ Students can extend their learning of fractions and practice questions for reinforcement, with the use of Rainforest Maths.

## The Lesson    🕐 30 MINS

### Interactive Pattern Blocks—Marian Small's Activity

- Hand out printed Marian Small's Student Problem: Pattern Blocks. Log in to **Teacher Console > eBooks > Year 5 > Marian Small's Pattern Blocks #1 > Student Problem > Print.** Have students work together to complete the question. Students can work in partners or small groups to determine various answers. Give students enough time to explore various possibilities and use a variety of different shapes, patterns and number of blocks.

- Display Interactive problem on the Interactive Whiteboard. In your teacher console, click on **eBooks > Year 5 > Marian Small's Pattern Blocks #1 > Interactive Problem.** Students can then come to the interactive whiteboard and display their answers. Discuss with students how there are various answers to this problem. Fractions can be represented in a variety of ways.

  **Ask Students,**
    – What would happen if we could only use red and yellow blocks?
    – How could we represent ½ using the fewest blocks?
    – What different colour combinations could you use?
    – Did your pattern have a line of symmetry?
    – Did it need to have one?
    – Can you make two equivalent fractions with your pattern blocks?

  **NOTE:** Try Extension of Learning task to introduce fractions on a number line, if students are grasping this concept well.

### Reinforcement: Equivalent Fraction Activities

- Assign curriculum activities for students to complete in the student console. Year 4 Australia course, suggested activities include:
  – Model Fractions
  – Equivalent Fractions on a Number Line 1
  – Equivalent Fraction Wall 1
  – What Fraction is Shaded?

- Students can use Rainforest Maths Year 5 Fractions section for extra practice. It can also be displayed on the interactive whiteboard for students to reference while completing their assigned tasks.

**Extra-time/cross-curriculum activity:** Have students create fraction art. Students should represent a fractional amount and show an equivalent fraction. Students can represent their fractions using paper and glue, drawing pattern blocks, creating two real life objects, etc.

## After the lesson    🕐 5 MINS

- Play a game of Live Maths as a whole class. Log in to your Teacher Console and click on **Demonstrations > Live Maths > Level 6 > World > Go**. Level 6 has some fraction computation questions.
- Have students complete an "Exit Slip" card before leaving class.
- **Ask students:** What did you learn about fractions? How do you best represent fractions? Share your learning.

# LESSON PLANS: AUSTRALIA
## Year 4: Measurement and Geometry
### Symmetry

## 45-55 MINS

powered by **Mathletics**

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**Strand:** Measurement and Geometry

**Substrand:** Location and Transfromation

**Outcome:**
- Create symmetrical patterns, pictures and shapes with and without digital technologies. (ACMMG091)

### Introduction to Lesson — 10 MINS

**Teacher Background:**

Students should log in to their own Student Consoles on laptops or in the computer lab. Introduce the topic of symmetry to students. Have them explore Mathletics to investigate and determine what it means for a shape to be symmetrical or non-symmetrical. Then introduce the term parallel. Have students investigate this term and discuss in their table groups what it means for a shape to have parallel sides.

**Ask prompting questions:**
- How do you know if a shape is symmetrical?
- How could we test this?
- What would make a shape non-symmetrical?
- What shapes have parallel sides?
- What does this mean?
- How can you determine what shapes do not have parallel sides?
- Have students explore 2D shapes and 3D objects.

### ITEMS NEEDED
- ✔ Mathletics teacher login
- ✔ Interactive whiteboard
- ✔ Mathletics eBooks
- ✔ Dot paper
- ✔ Rulers
- ✔ Paper for folding
- ✔ Computers/tablets

### ASSESSMENTS
- ✔ View "Are you ready?" results for a pre-assessment of learning.
- ✔ Check Results section for curriculum activity marks.
- ✔ Group work and participation

### ACCOMMODATIONS/ MODIFICATIONS
- ✔ Ability/levelled groups
- ✔ Encourage students to use the "Something Easier" or "Something Harder" options when completing curriculum activities.

### EXTENSION OF LEARNING
- ✔ Art: Draw a picture that is symmetrical using only 2D shapes. Colour the design.
- ✔ Curriculum activities: Angles, nets, and other geometric properties.
- ✔ Year 4: Shape, Space and Position

## The Lesson
**30-35 MINS**

### Centres

- Teachers can add more centres to the ones indicated below: for example, the main resource used in the classroom. For the eBook centre, please review which pages you would like the students to complete. Depending on how much work students can get done with each centre, rotation can occur about every 10 minutes. Groups will vary depending on class size.

  o **Centre 1: Symmetry Folding**—Go to **eBooks > Year 4 > Space, Shape and Position** and print out page 8. Students should have two copies of this page. For question 1, students need to cut out the shapes and fold in half as many times as they can. They can then draw as many lines of symmetry as the shape has on their second copy of that page.
  **Ask students:** Can we fold the shape any way we want? Why do we have to fold it in half? How do you know this is a line of symmetry? What makes it symmetrical? If there is time, have students complete the symmetrical challenges on page 9 of the same eBook.

  o **Centre 2: Maths Journals/Word Wall Creation**—Have students log in to their student consoles and look up symmetry, parallel, perpendicular, 3D object, vertices, edges, transformation, tessellation, rotation, etc. in **Concept Search** and **Animated Maths Dictionary**. If using journals, students should write down their own definition of the word, an example, and a picture. If journals are not used in your classroom, students can generate a word wall of specific terms and concepts that will be covered during this unit. Each group can be responsible for 1–3 words to look up on Mathletics, and find a definition, example, and picture to add to the word wall. Students can write these on blank pieces of paper or index cards and add them to the bulletin board. **Note**: If laptops are not available for all students, have groups explore these concepts on the interactive whiteboard using the teacher login.

  o **Centre 3: Rainforest Maths/Activities**—Students should log in to their Student Console and work in Rainforest Maths for review and practice. Have students work on Year 3 for review, and then try Year 4: 2D shapes. On the left-hand side, there are different sections they can try. Once they feel comfortable, students should begin completing curriculum activities in Shape and Space.
  **Suggested activities:** Are you Ready, Symmetry or Not?, and Symmetry. This will give you a good understanding of where students are currently at and allow students to practice what has been introduced today.

## After the lesson
**5-10 MINS**

- Students should find objects in the classroom that have lines of symmetry.
- Have them trace with their hands where the line of symmetry could be.
- Challenge students by asking them: Can you find an item that has more than 1 line of symmetry? What shape could it be? Can you find an irregular polygon? Do you think this shape/object will have a line of symmetry? Where can you find symmetry on your body? Is it perfect symmetry?

# LESSON PLANS: AUSTRALIA
## Year 4: Measurement and Geometry
### Area

🕐 **50 MINS**

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**Strand:** Measurement and Geometry

**Substrand:** Using units of measurement/Shape

**Outcome:**
- Compare objects using familiar metric units of area and volume. (ACMMG290)
- Compare the area of regular and irregular shpes by informal means. (ACMMG087)

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## Introduction to Lesson    🕐 **10 MINS**

**Teacher Background:**

Log in to

      **Teacher Console > Demonstrations > Concept Search.**

Type **Area** into your **Search** bar.

**Ask students:**
- When would we need to measure area?
- How could you measure the area of the classroom?
- What units of measurement would work best?
- Estimate the area of your desk.
- What unit of measurement did you use?

Students should determine a definition of area in their maths journals or add to a Maths Word Wall.

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### 📚 ITEMS NEEDED
- ✔ Mathletics teacher login
- ✔ Interactive whiteboard
- ✔ Mathletics eBooks
- ✔ Ruler
- ✔ Geoboards
- ✔ 1cm grid paper

### 📋 ASSESSMENTS
- ✔ Collect and assess "Claim Your Path" group handouts.
- ✔ Check Results section for curriculum activity marks

### ⚙ ACCOMMODATIONS/ MODIFICATIONS
- ✔ Ability/levelled groups.
- ✔ Encourage students to use the "Something Easier" or "Something Harder" options when completing curriculum activities.

### 📜 EXTENSION OF LEARNING
- ✔ Have students draw a room with its dimensions. Students should include pictures, rugs, windows and other objects where the perimeter and area can be determined.
- ✔ Rainforest Maths: additional area and perimeter practice. Encourage students to try a year level above or below based on their ability.

## The Lesson 🕐 30 MINS

### Area—Square Centimetres

- Hand out grid paper to students. Students can use their pencils to shade in irregular polygons or use blocks to fill in the shape. Use page 16 of the Length, Perimeter and Area eBook. Display the questions on the board and have students create as many different shapes as they can with the proposed area.

- **Prompt students by asking:** How many different polygons can have an area of 8 square centimetres? What if all sides had to be equal in length? Can you make an irregular polygon? How could we determine the area and perimeter of one of your polygons?

### Problem Solving: Claim Your Patch

- Students need to be in groups of 4 for this Problem Solving activity. You will need to go to **eBooks > Problem Solving > Level 2 > Logical Reasoning > Worksheet Four**.

- Print one worksheet per group. The aim in this game is to create polygons with an area greater than 1 but less than 13 with a perimeter of 20 cm. Students will need to use their Problem Solving skills to determine what different shapes could be made. Each person in the group should use a different colour to draw their shapes.

- The teacher can click on **Demonstrations > Rainforest Maths > Year 4 > Area**. Draw your own shapes and display them on the interactive whiteboard. Students who are having difficulty can work one-on-one with the teacher to determine different polygons. Students are able to draw the shapes on graph paper and interactively determine area and perimeter.

## After the lesson 🕐 10 MINS

- Students can play the Problem Solving Game "Making Tracks."

- Access this through **Teacher Console > Demonstrations > Problem Solving > Perimeter > Making Tracks.**

### Fact of the Day

- Have students write down one fact they learned about Area. This can be added to a maths bulletin board or written in maths journals.

🕐 **45 MINS**

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**Strand:** Number and Algebra

**Substrand:** Patterns and Algebra

**Outcome:**
• Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction. (ACMNA107)

| Introduction to Lesson | 🕐 5 MINS |
|---|---|

**Teacher Background:**
• Give students a blank piece of paper. Have students create as many different number patterns as they can. Their number patterns can increase or decrease. Students can also create geometric patterns. Have students represent number patterns in as many ways as they can, working collaboratively in their table groups.
• Have students determine what the rule could be for their pattern.

📚 **ITEMS NEEDED**
✔ Interactive whiteboard
✔ Mathletics teacher login
✔ Student handouts from eBooks
✔ Computers/tablets
✔ Toothpicks
✔ Chart paper
✔ Markers
✔ Geometric pattern blocks

📑 **ASSESSMENTS**
✔ Observations
✔ Collaborative/Group work
✔ Assess patterns on chart paper.
✔ Assess patterns made with toothpicks.

⚙ **ACCOMMODATIONS/ MODIFICATIONS**
✔ Allow students to use translucent geometric pattern blocks to help create their patterns.
✔ Encourage students to click on "Something Easier" and "Something Harder" within the Mathletics curriculum activities.

📋 **EXTENSION OF LEARNING**
✔ Curriculum activities
✔ Year 5 eBook "Patterning and Algebra," Patterns and functions additional pages.
✔ Rainforest Maths Year 5: Number Sequences for extra practice.

## The Lesson

30 MINS

### Collaborative Group Work

- **Group 1—Matchstick Problems**
  Print student handouts from the **eBook > Year 5 Mathletics > Patterns and Algebra > Patterns and functions – matchstick patterns** on pages 5 and 6. Have students use toothpicks to practice making a repeating geometric pattern. Students can complete a few of the tables found on these handouts. Ask students to then use the toothpicks to create their own geometric patterns and determine the function rule. Students should work together to create their pattern and glue it onto cardstock, displaying their rule at the bottom. These can then be displayed around the classroom for future reference.

**Note:** Students can also experiment with growing and shrinking patterns. Can students add on to their existing shape? How would the pattern look if the shape were repeated with flips, slides, and turns?

- Assign curriculum activities for students to complete in the student console. Year 5 Australia course, suggested activites include:
  - Describing Patterns
  - Increasing Patterns
  - Decreasing Patterns
  - Table of Values
  - Pyramid Puzzles 2.

**Note:** With collaborative group work students should be working together to come to a conclusion. All members of the team should be communicating and contributing to the group's mark. You can have students switch groups once they have completed one task and instruct students to complete the second task. This time should allow for both tasks to be completed.
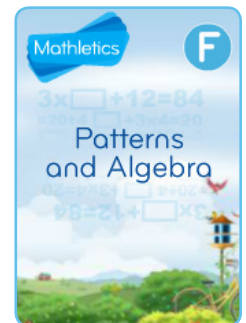
## After the lesson

10 MINS

### Discussion

- Have a quick discussion with your students about repeating patterns. **Prompting questions:** Where have you seen geometric patterns in real life? How do we grow or shrink a pattern? Where have you seen a numerical pattern? How did you know the function rule?

# LESSON PLANS: AUSTRALIA
## Year 5: Measurement and Geometry
Measuring Length

🕐 **45 MINS**

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**Strand:** Measurement and Geometry

**Substrand:** Using units of measurement.

**Outcome:**
• Choose appropriate units of measurement for length, area, volume, capacity and mass. (ACMMG108)

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## Introduction to Lesson 🕐 **10 MINS**

**Teacher Background:**

Log in to your

**Teacher Console > Demonstrations > Concept Search.**

Type Length into the **Search** bar. Review perimeter and area with students. Search different units of measurement in **Concept Search** and **Animated Maths Dictionary**.

  **Ask students:**
   • When it is appropriate to use specific units of measurements.
   • When would we use centimetres as our unit of measurement?
   • When would it be appropriate to use metres?
   • Have students estimate different lengths in the classroom.

  **Ask students:**
   • How did you know what unit of measurement to use?
   • Was your estimation close to the actual length/height?
   • Why or why not?
   • Record information on a KWL chart.

**NOTE:** Teachers should show students a variety of manipulatives they can use during the measurement unit. Scales, rulers, metre sticks, links, tape measures, measuring cups, pedometers, etc.). Have students brainstorm real-life examples of when you would use these measurement tools.

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### 📚 ITEMS NEEDED
✔ Interactive whiteboard
✔ Mathletics teacher login
✔ Computers/tablets
✔ Measurement tools

### 📑 ASSESSMENTS
✔ Observations
✔ Participation
✔ Curriculum activity marks (found in Results)
✔ Have students initial their sticky notes for assessment.

### ⚙ ACCOMMODATIONS/ MODIFICATIONS
✔ Ability groups
✔ Encourage students to use the "Something Easier" and "Something Harder" sections of curriculum activities.
✔ Allow students to work in a year level above or below in Rainforest Maths.

### 📋 EXTENSION OF LEARNING
✔ Problem Solving
✔ Use scales for measurement in science.
✔ Design a recipe with students. Use different types of measurement within the recipe. Ask students to convert measurements where necessary.
✔ eBook: Year 5, Length, Perimeter and Area, Units of length

## The Lesson

🕐 30 MINS

**Research/Curriculum Activities/Rainforest Maths**

- Have students log in to their **Student Console** of Mathletics. Give students time to explore different types of measurement in the **Concept Search** and **Animated Maths Dictionary** on their own.

- Have students complete curriculum activities in the student console.
  Suggested activities (Year 5 Australia course):
  – Which unit of measurement?

  Suggested activites in something easier:
  – Measuring length

  Suggested activites in something harder:
  – Converting units of length.

**Cross-Curriculum Activity:** Students can measure and record their height and their body parts during phys. ed time. They can measure different objects and physical activities (i.e., distance jumped, length of the gymnasium, length of strides when walking, etc.).

**eBook: Unit Bingo**

- As a class, play a game of Unit Bingo. Players should fill out their individual bingo cards. Unit bingo is found in **eBooks > Year 6 > Length, Area and Perimeter** on page 2 in the Units of length section.

- Once students have completed their cards, the teacher can call out units of measurement. If there is an item written on their card that could be measured using that unit of measurement, they can cross it off. First player to get a bingo wins!

- Discuss with students what the most common unit of measurement is. Why do they think this is the case?
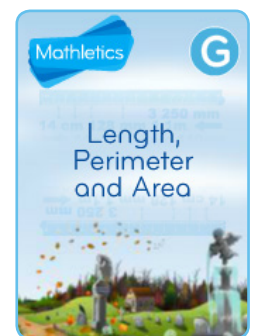
## After the lesson

🕐 5 MINS

- On the KWL chart, have students fill out a sticky note with one thing they learned about choosing the correct unit of measurement, a real-life example of something we measure, or one thing they learned about measurement they did not know before today's class. Students can stick these onto the "L" spot.

- Have students periodically complete these; at the end of the Measurement unit you will be able to see all of the things students have learned each day.

# LESSON PLANS: AUSTRALIA
## Year 5: Measurement and Geometry
### 24 Hour Time

**50 MINS**

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**Strand:** Measurement and Geometry

**Substrand:** Using units of measurement

**Outcome:**
• Compare 12- and 24-hour time systems and convert between them. (ACMMG110)

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## Introduction to Lesson                    **10 MINS**

**Teacher Background:**

Students should be familiar with reading and using a 12-hour clock prior to this lesson.

• Display on interactive whiteboard the word Time. Have students write down all of their ideas about time on chart paper. They can draw pictures or write words and numbers to represent what time means to them.

**Prompt students:**
  • How do we measure time?
  • What types of time are there?
  • When/Where do we use time?
  • Discuss a variety of answers. Introduce 24-hour time and when we generally measure time using the 24-hour clock.

• Log in to the

   **Teacher Console > Demonstrations > Concept Search.**

Type Time into the **Search** bar. Display on the interactive whiteboard the 12-hour clock and review with students. Then click on the 24-hour clock and explain how to convert the time.

**Ask students questions like,**
  • What type of activity would you do at 18:00?
  • What types of activities would you not do at 23:00?
  • What could be done between 9:00 and 13:00?
  • How much time has elapsed?

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### ITEMS NEEDED
✔ Interactive whiteboard
✔ Mathletics teacher login
✔ Student handouts from eBooks
✔ Computers/tablets
✔ 12-hour and 24-hour clocks

### ASSESSMENTS
✔ Observations
✔ Collaborative/group work
✔ Collect and assess time wheel.

### ACCOMMODATIONS/ MODIFICATIONS
✔ Allow students to make their own clocks with both 24-hour and 12-hour time intervals. Students can use this as a maths manipulative.
✔ Encourage students to click on "Something Easier" and "Something Harder" within the Mathletics curriculum activities.

### EXTENSION OF LEARNING
✔ Measure time in phys. ed and record with a stop watch. Students can then determine total elapsed time to complete an activity.
✔ Year 4 and 5 time sections in Rainforest Maths for extra practice

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## The Lesson

🕐 35 MINS

### eBook: 24-Hour Time Dominoes Game
- Have students work in partners or play this game as a class.
- Print off the 24-hour bingo game cards by logging in to your **Teacher Console > eBooks > Year 5 > Measuring Time.**
- Print page 8, "24-hour time bingo game".
- One student or the teacher can be the caller.
- The other partner, or the class will write down 6 times.
- They must be o'clock or half past time, no other intervals.
- The caller or teacher then shuffles the cards and calls out the times.
- The first person to cross out all 6 times wins!
- You could call the times out in 12-hour clock times and students would need to convert the time to 24-hour times.

### Collaborative Group Work

- **Group 1—Live Maths**
  Students should try Level 5/6 of Live Mathletics on their own accounts or on a classroom computer under teacher account. One student types while the other group members shout out the answers. These levels include time conversion.

- **Group 2—Time Activities**
  Students should work on curriculum activities.
  Suggested activities in the Year 5 Australia course are: 24-Hour Time.
  Suggested activities in the Year 4 Australia course are: Hours & Minutes.
  Suggested activities in the Year 3 Australia course are: Five Minute Times, What is the Time?.

- **Group 3—eBook Handouts**
  o Option 1:
    Students work together on Year 5 eBook: **Time > Measuring Time > page 5 > Question 6.**
    Printed or on interactive whiteboard.

  o Option 2:
    Students who still need some additional practice with 12-Hour Clocks can use the **Year 4 eBook or Year 5 eBook**: **Time > Telling Time section** or **Time > Measuring Time section**.
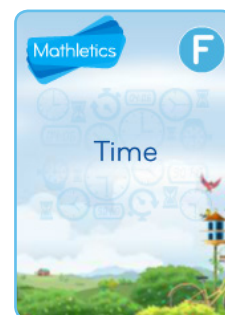
## After the lesson

🕐 5 MINS

### Think, Pair, Share
- Have students reflect on their learning of Time with a partner. Give students a few minutes to think, pair up with another partner and share their learning.
- Prompt question: How did you measure time today? What were your challenges with a 24-hour clock?

# LESSON PLANS: AUSTRALIA
## Year 5: Statistics and Probability
Introduction to Probability

## 45 MINS

**Strand:** Statistics and Probability

**Substrand:** Chance

**Outcome:**
- List outcomes of chance experiments involving equally likely outcomes and represent probabilities of those outcomes using fractions. (ACMSP116)

### Introduction to Lesson — 10 MINS

**What Is Probability:**
- Take a few minutes to begin a discussion about probability.
- Create a KWL chart with students to determine what they already know about probability and what they would like to learn.
- On the interactive whiteboard or individually look through Concept Search.
- Log in to
        **Teacher Console > Demonstrations > Concept Search.**
- Suggested terms to search are Probability, Chance, Random, Spinner. Add these words to your Maths Word Wall or maths journal.
- You can also look up the terms in the **Animated Maths Dictionary** for a specific definition.

### ITEMS NEEDED
- ✔ Interactive whiteboard
- ✔ Mathletics teacher login
- ✔ Computers/tablets
- ✔ Spinners
- ✔ Die
- ✔ Chart paper
- ✔ Markers
- ✔ Coins

### ASSESSMENTS
- ✔ Observations
- ✔ Participation
- ✔ Probability questions (index cards)
- ✔ Maths journals (if implemented by teacher)
- ✔ Collect eBook handouts for assessment.

### ACCOMMODATIONS/ MODIFICATIONS
- ✔ Ability groups
- ✔ Encourage students to use manipulatives for probability.
- ✔ Limit/modify the number of questions required,
- ✔ Have a teacher-led centre. Scaffold student learning.
- ✔ Allow students to work in a Year level above or below in Rainforest Maths.

### EXTENSION OF LEARNING
- ✔ Curriculum activities
- ✔ During Science, have students determine the outcomes of an experiment.
- ✔ Have students create tree diagrams during language arts.

## The Lesson 🕐 30 MINS

**Problem Solving**

- To begin having students think about possible outcomes, start with a combinations problem solving game. Go to **Demonstrations > Problem Solving > Combinations > I-scream Lady game.**

- Students should take turns coming up to the interactive whiteboard and determining a possible combination. At the end, **ask students:** How many different combinations are there? If all the ice cream cones were in a freezer and I pulled one out, what would be my chances of having one with chocolate? mango? How would we represent this as a fraction? How else could we organise this data? Am I more likely to get an ice cream with chocolate or strawberry?

- You can also try the **Monkey Matters** game under **Data** in **Problem Solving**. This will introduce students to a tree diagram and how to record possible outcomes using this method.

**Probability Games (Centres)**

o **Centre 1—Spinners:** Have students complete page 6 of the Year 6 eBook "Chance and Probability." Give students spinners, or have them create their own. Students should use these manipulatives to help answer the questions. Have students glue these sheets into their maths notebooks. What are you most likely to land on? What are you less likely to land on? What outcomes are possible?

o **Centre 2—The Mathletics Cup:** Have students complete page 9 of the Year 5 eBook "Chance and Probability." Students should work in partners to create their own games. Once they have tested their game, students should play with another pair. Is your game fair? How could you improve your game?

o **Centre 3—"Rainforest Maths":** Using the interactive whiteboard, log in to the **Teacher Console > Demonstrations > Rainforest Maths > Year 5 > Space > Probability.** Have students work together at this centre to complete the interactive problems. Students will have a chance to explore dice probability, spinners, and tree diagrams. After centres are completed, have one student from each group teach the other students what their group did and the strategies they used to determine the possible outcomes.
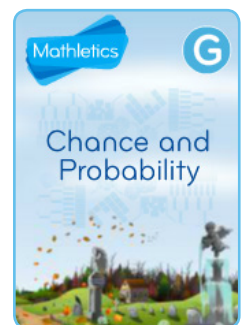
## After the lesson 🕐 5 MINS

- **What Are the Chances?**
  Have students complete on an index card their own probability question. With elbow partners, give students the sentence starter, "What are the chances...." Students should think about when they would see/use probability in real life. Partners should determine a question to ask another group. Collect questions to solve next class. (Ex. What are the chances of running into a girl in our classroom?) Students could then determine the odds of running into a girl out of the whole school or class.

🕐 **50 MINS**

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**Strand:** Number and Algebra

**Substrand:** Patterns and Algebra

**Outcome:**
- Continue and create sequences involving whole numbers, fractions and decimals. Describe the rule used to create the sequence. (ACMNA133)

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## Introduction to Lesson      🕐 10 MINS

**Teacher Background:**

Play the Marian Small video "Pyramid Prediction." Log in to your

**Teacher Console > eBooks > Grade 6 >
Marian Small's Pyramid Prediction > Videos.**

This video has two parts. Play part 1 of this video, stopping at each section for questioning. Play part 2 of the video and pause for students to investigate and calculate possible answers for the patterns.

**Prompting Questions:**
- What is happening in this row/section of the pyramid?
- How do you know the pattern rule?
- Can you determine what the top number would be without filling in the other rows?

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### 📚 ITEMS NEEDED
- ✔ Interactive whiteboard
- ✔ Mathletics teacher login
- ✔ Computers/tablets
- ✔ Marian Small's Pyramid Prediction handout
- ✔ Maths journals (if implemented by teacher) /blank paper

### 🔍 ASSESSMENTS
- ✔ Observations
- ✔ Discussion during Guided Maths Group time
- ✔ Collect and assess journal responses

### ⚙ ACCOMMODATIONS/ MODIFICATIONS
- ✔ Levelled or ability groups for guided maths time
- ✔ Scaffold during guided maths

### 📜 EXTENSION OF LEARNING
- ✔ Curriculum activities
- ✔ Grade 6, Rainforest Maths
- ✔ Have students find real-life examples of when they would need to use a number pattern or have seen/used a growing/shrinking pattern in their lives.
- ✔ Write a journal response on where they have used a table of values before. When can it be used? What professions would use this type of table?
- ✔ Create your own maths game/maths brain twister using a table of values or pyramid.

## The Lesson
🕐 35 MINS

### Shared Maths Activity

**Pyramid Prediction Interactive**

- Go to the Marian Small eBook "Pyramid Prediction. On the right side of the screen, click on Interactive. Display this problem on your interactive whiteboard. Have students choose the numbers to put in the bottom row. Click on the connector boxes.
  **Ask students:** What has happened to the numbers? What rule/pattern can you come up with? Can we predict what the next row of numbers will be? Can we predict the number at the top of the pyramid? How do you know this?

### Guided Maths Group

**Teacher-Led Pyramid Handout**

- In levelled/ability groups, teachers should designate a table or spot in the classroom to call over groups to work with them on the Pyramid Prediction handout sheet found in Marian Small's eBook "Pyramid Prediction." Work with groups to scaffold student learning and determine how your students are grasping this concept. Have students complete three different pyramids (worksheet found with Teacher Notes) and explain to you their steps in completing the question. Stop students during their work and ask them to predict what the top number would be. Guide student learning using the questions found in the Teacher Notes section of this Marian Small eBook.
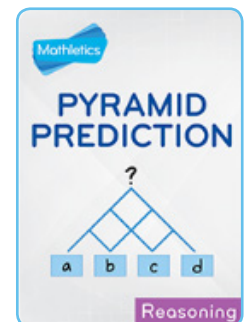
### Independent Maths Activity

**Concept Search/Journal**

- Have students log in to their **Student Console > Concept Search.** Type table of values into the Search bar. Students should investigate this concept and how it is similar to and different from the pyramid patterns.
  **Prompting questions to post:** How are the pyramid and table of values similar? Can you determine a pattern rule using a table of values? Can you determine a pattern rule using a pyramid? Which method do you find easier?
  Students should journal their response and show an example of both ways to describe and represent growing and shrinking patterns. If your students do not have maths journals, they can use a maths response sheet or loose-leaf paper to express their ideas.

## After the lesson
🕐 5 MINS

**Live Maths**
- Give students time at the end of class to play Live Maths against other students in their class. Each round is 60 seconds; you can allot 5–10 minutes for this activity. Add "Top Live Mathlete of the Day" to your board for the person who received the greatest number of points.

# LESSON PLANS: AUSTRALIA
## Year 6: Measurement and Geometry
Angles

🕐 **45 MINS**

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**Strand:** Measurement and Geometry

**Substrand:** Geometric Reasoning

**Outcome:**
• Investigate, with and without digital technologies, angles on a straight line, angles at a point and vertically opposite angles. Use results to find unknown angles. (ACMMG141)

### Introduction to Lesson 🕐 10 MINS

**Teacher Background:**

Log in to Mathletics

> **Teacher Console > Demonstrations > Concept Search.**

Search Protractor in the **Search** bar. Have students interact with the protractor to measure angles. Ask students to draw a shape that has this type of angle included in it.

Have students use their arms for the sides of the angle.

  **Ask students,**
- Can you make a 90° angle with your arms?
- Can you construct an angle greater than 90°?
- What happened to your arms?
- What do we call and angle that is larger than 90°?
- What about when it is less?
- How do we properly measure an angle?

### 📚 ITEMS NEEDED
- ✔ Interactive whiteboard
- ✔ Mathletics teacher login
- ✔ Mathletics Grade 6 eBook (Lines and Angles) printed for each student
- ✔ Markers
- ✔ Protractor

### 🔍 ASSESSMENTS
- ✔ Have students use self and peer assessment for the "Hand it over" activity.

### ⚙ ACCOMMODATIONS/ MODIFICATIONS
- ✔ Have students work with levelled groups or partners.
- ✔ Use this activity as a rotation.
  **1st station:** Measuring angles on the interactive whiteboard.
  **2nd Station:** "Hand it over"activity in eBooks
  **3rd Station:** Constructing polygons

### 📃 EXTENSION OF LEARNING
- ✔ Have students complete the paper-folding activity in the Grade 6 eBook Geometry, Lines and Angles, question 1.
- ✔ Grade curriculum activities: Shape and Space-Angles: Classifying Angles, What Type of Angle? Labelling Angles and Measuring Angles.

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## The Lesson

🕐 **30 MINS**

### "Hand it Over" Activity

- Display "Hand it over" activity on interactive whiteboard.
  Sign in to **Mathletics Teacher Console > eBooks > Grade 6 > Geometry**. Click on "Lines and Angles". Scroll to "Hand it over" activity on the last page.

- Have students work in partners or groups to trace their hands in different positions. Then have students estimate the size of the angles between their fingers. Have partners/groups exchange their hand with another group and measure the angles between the fingers. Label the fingers with the type of angle (e.g., acute, right, straight, obtuse).
  **Discussion Questions:** How did your hand/finger angles differ from another group's? How would the position of your fingers affect the size of the angles?

- In the designated box on the interactive whiteboard, generate a hand with the class that has one right angle one obtuse angle. How would this hand have to look? What other types of angles are in your hand? How do you know?
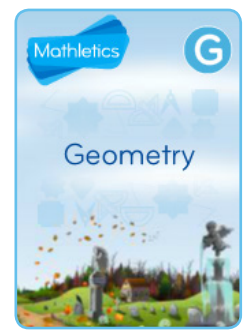
### Constructing Polygons

- Search polygons in Concept Search. In **Mathletics Teacher Console > Demonstrations > Concept Search** click **Concept Search** again. Type "polygon" into **Search** bar.

- Review what makes a shape a polygon. Discuss what types of angles are present in different polygons. Review acute, obtuse, straight and right angles again.

  **Ask students:**
    - What polygon could you draw with one 90° angle?
    - What polygon could you draw with one acute angle?
    - What polygon could you draw with two different types of angles?

  Students can draw these independently, in small groups, or collaboratively on the interactive whiteboard.

## After the lesson

🕐 **5 MINS**

- Discuss with students real-life examples of where we find angles.

- **Ask students:** What jobs/sports would require you to know how to measure an angle? (soccer, architect, designer, construction worker, fitness instructor, etc.) Where do we see angles in the classroom? at home? (clocks, desks, walls, rugs, rooms, etc.)

# LESSON PLANS: AUSTRALIA
## Year 6: Statistics and Probability
### Creating, Understanding and Interpreting Line Graphs

🕐 **50 MINS**

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**Strand:** Statistics and Probability

**Substrand:** Data representation and interpretation

**Outcome:**
- Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables. (ACMSP147)

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## Introduction to Lesson     🕐 10 MINS

**Teacher Background:**

Students should have prior knowledge of graphing from year 5. Conducting surveys, recording data in line graphs should have been taught prior to this lesson. This lesson's main focus is understanding, interpreting data, and drawing conclusions from graphs.

To introduce how to properly read and interpret data from a line graph, show students the video "Introducing Distant Time Graphs."

Log in to your

**Teacher Console > Toolkit.**

Type line graphs into your **Search** bar. Click **Presentations** tab on the left side. Choose "Introducing Distant Time Graphs." This video will introduce students to a line graph and how to set up a vertical and horizontal axis with a proper scale. Pause during the video to discuss what is being shown on the line graph. Ask students, Why do we use this scale for time? Is there another range we could use? Where is the highest point on the graph? Why do you think they chose this measurement? Tell a story about how this data could have been collected.

**NOTE:** There are a variety of other videos related to interpreting graphs, scatter plots, and other areas of data management you can explore with your students.

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📚 **ITEMS NEEDED**
- ✔ Interactive whiteboard
- ✔ Mathletics teacher login
- ✔ Laptops
- ✔ eBook worksheet printed
- ✔ Graph paper for practice

🔍 **ASSESSMENTS**
- ✔ Group work
- ✔ Oral presentation
- ✔ Review graphs

⚙ **ACCOMMODATIONS/ MODIFICATIONS**
- ✔ Create ability or levelled groups.
- ✔ Data disaster problem could be done individually and assessed.
- ✔ Give students the option to submit their work or do an oral presentation.
- ✔ Have students watch the video together at the beginning of class. Allow students to formulate questions. Lead your lesson by following their inquiries.

🏅 **EXTENSION OF LEARNING**
- ✔ Mathletics Year 6 eBook: "Data Representation," Collecting and analyzing data, p.30, or Types of graphs 3, p.12
- ✔ Assign curriculum activities
- ✔ Rainforest Maths, Grade 6. Data, line graph

# LESSON PLANS: AUSTRALIA
## Year 6: Statistics and Probability
### Creating, Understanding and Interpreting Line Graphs

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## The Lesson
🕐 30 MINS

**Open-Ended Problem Solving—The Story of a Graph**

• Display open-ended problem on Interactive whiteboard.

• Log in to your **Teacher Console > eBooks > Problem Solving > Problem Solving Level 3 Book > Open Ended Problems > Worksheet 5**.

• Review the line graph with students; ask prompting questions like, Why is this an appropriate scale to measure water on? What information can you tell from this graph? Why was a line graph chosen to organise the data? How could we graph all months of the year? What would be different about that graph?

• Have students work in their table groups or with partners to brainstorm and explore various ideas for the line graph and pie graph. Ask students prompting questions like, What would be an appropriate title? How could this data have been collected? What data would not work on these graphs? Discuss various responses from different groups.

**Line Graphs**

• Students complete Year 6 worksheets about Line Graphs.
To access, go to **Year 6 eBooks > Data Representation > Types of graphs?**
or students complete **Line Graphs Interpretation** in student console.

**Extra-time/cross-curriculum activity:**

• Have students collect data prior to this lesson about some aspect of their community, an experiment, an issue in the school, or from another subject. Have students record their observations or measurements over time.

• Students can then use a line graph to represent the data and show a trend over time. Science experiments/growth plans would work best for this activity.

**Mathletics Problem Solving Level 3**
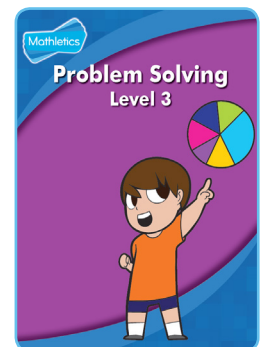
## After the lesson
🕐 10 MINS

**Oral Presentation**
• Give students time at the end of the lesson to prepare a one-minute class discussion.
• Have students present their stories related to the graphs. Formulate class discussion based on student responses.

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For more information about these lesson plans, or any aspect of Mathletics, contact our friendly team.

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