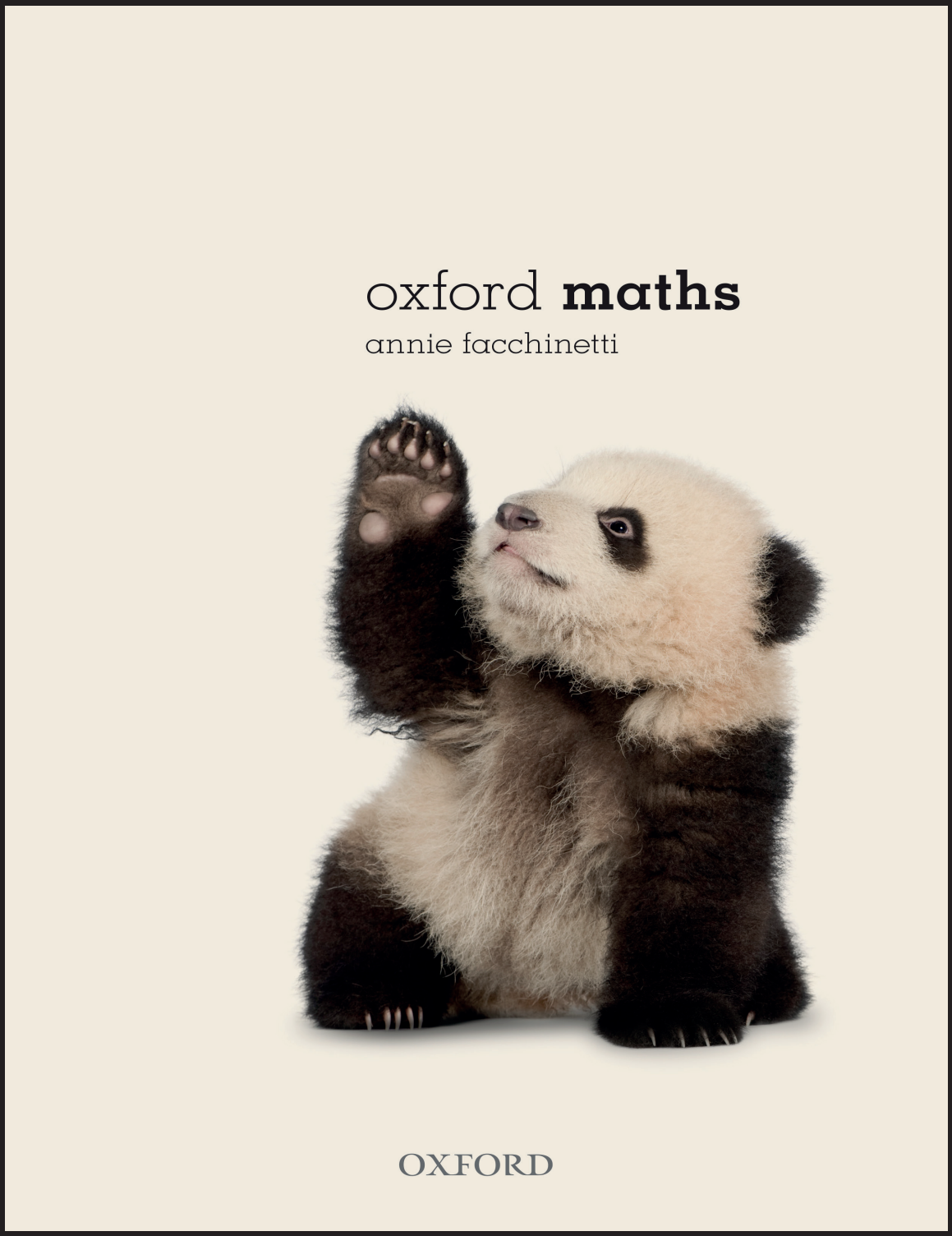


Helping you implement your product

OXFORD

Contents*

Planning resources

- Term planners
- Scope and sequence charts
- Learning sequences
- 'The importance of practice' document
- 'What does Oxford Maths look like in the classroom?' video
- 1 pre-test and post-test for each topic
- Assessment book
- Student tracker
- Post-assessment grading guide
- Activity sheets
- Over 25 different digital teaching objects for each year level
- Black line masters
- 'Potential difficulties' videos
- Student book answers
- Assessment book: annotated answers
- Glossary

*This is the contents from your *Oxford Owl* Teacher Dashboard.

oxford maths

Oxford Maths Foundation Suggested Term Planner

Term 1

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1 – 2	1. Number and place value	1. Numbers 0 to 10	Explore, record and interpret numerals to 10 and count in sequence	6–9	2–3
3	4. Patterns and algebra	1. Sorting	Sort objects and shapes into groups with a common feature	62–65	18–19
4	1. Number and place value	2. Counting to 10	Count small collections of items, and write and represent numbers to 10	10–13	2–3
5	5. Using units of measurement	3. Mass	Use hefting and visual comparisons to compare the mass of familiar items	84–87	24–25
6	1. Number and place value	3. How many?	Count, compare and record quantities to 10	14–17	2–3
7 – 8	1. Number and place value	6. Ordinal numbers	Read write and interpret ordinal numbers to 6th	26–29	6–7
9	6. Shape	1. 2D shapes	Recognise, sort, draw and name common two-dimensional shapes and explore their properties	96-99	28–29

oxford maths

Oxford Maths Foundation Suggested Term Planner

Term 2

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1	1. Number and place value	4. Numbers without counting	Match quantities with numerals using subitising	18–21	4–5
2	1. Number and place value	5. Comparing numbers	Explore the concepts of more, less and same by comparing small quantities	22–25	4–5
3 – 4	5. Using units of measurement	1. Length, height and area	Compare and describe the length, height or area of familiar objects using appropriate language	74–78	20–21
5 – 6	1. Number and place value	7. Numbers 10 to 20	Explore, record and interpret numerals from 10 to 20 and count in sequence	30–33	8 –9
7	7. Location and transformation	1. Position	Interpret everyday language of position to locate and place familiar items	104–107	30–31
8	2. Fractions and decimals	1. Halves	Investigate numerical and visual representations of halves of whole objects and shapes	54–57	14–15
9	8. Data representation and interpretation	1. Yes or no questions	Collect, record and make simple inferences about data based on yes/no questions	112–115	32–33

oxford maths

Oxford Maths Foundation Suggested Term Planner

Term 3

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1	1. Number and place value	8. Teen numbers	Count, compare, order and record quantities to 20	34–37	8–9
2	8. Data representation and interpretation	2. Picture graphs	Construct and answer simple questions about picture graphs	116–119	32–33
3	1. Number and place value	9. More than and less than	Count and record numbers more and less than a given quantity to 20	38–41	10–11
4 – 5	5. Using units of measurement	2. Volume and capacity	Compare and describe the volume or capacity of familiar objects using appropriate language	79–83	22–23
6	4. Pattern and algebra	2. Repeating patterns	Identify repeating parts of a pattern and complete and create simple shape and object patterns	66–69	18–19
7 – 8	1. Number and place value	10. Adding to 10	Explore addition to interpret, represent, calculate and record with numbers to 10	42–45	10–11
9	5. Using units of measurement	5. Days of the week	Read, write and order the days of the week and connect them with everyday events	92–95	26–27

oxford maths

Oxford Maths Foundation Suggested Term Planner

Term 4

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1–2	1. Number and place value	11. Grouping	Explore, interpret and record equal groupings of small collections	46–49	12 – 13
3	5. Using units of measurement	4. Time	Sequence and compare the length of common events. Tell time to the hour	88–91	26–27
4	6. Shape	2. 3D objects	Recognise, sort and name common three-dimensional objects and explore their properties	100–103	28–29
5–6	1. Number and place value	12. Sharing	Explore, interpret and record sharing of small collections into equal groups	50–53	12–13
7	4. Patterns and algebra	3. Creating and describing patterns	Describe, continue and create patterns with shapes and objects	70–73	18–19
8	3. Money and financial mathematics	1. Money	Recognise and count small numbers of coins and notes in everyday situations	58–61	16–17
9	7. Location and transformation	2. Directions	Follow simple directions using appropriate language	108–111	30–31

Year F Learning sequence

Curriculum links

Australian Curriculum

Sort and classify familiar objects and explain the basis for these classifications. Copy, continue and create patterns with objects and drawings (ACMNA005)

Victorian Curriculum

Sort and classify familiar objects and explain the basis for these classifications, and copy, continue and create patterns with objects and drawings (VCMNA076)

NSW Syllabus

MAe-8NA recognises, describes and continues repeating patterns

Learning focus

Sort objects and shapes into groups with a common feature

Materials

- a feely bag
- everyday items such as spoons, pencils and toys
- beads
- string
- animal counters or plastic animals
- plastic bowls
- attribute blocks
- playing cards

Potential difficulties: Classification language

Some students may have difficulty using even simple mathematical language to describe how they sorted a group of items.

- Provide students with opportunities to develop their mathematical language by explicitly modelling words such as "same" and "group", supported by concrete materials and real-life examples.
- As students' understanding grows, introduce more precise mathematical language such as "attributes" or "features", again modelling the use of the language and giving students opportunities to use it.

Daily practice activity

Choose a different criterion each day to sort the students by. For example, ask students who have a sibling at the school to stand on one side of the room and those who don't to stand on the other; or ask students who own pets to stand together and those who don't to stand together. Brainstorm other ideas on how they might be sorted.

Session 1: Pre-assessment

Students to complete: Assessment book, Pre-test 9, Unit 4, Topic 1, p. 18. (Alternatively, you can download the test from the **Planning & Assessment** section of the Teacher Dashboard.) Read the questions aloud to students as a whole class or in small groups.

Session 2: Topic introduction

Whole class

Digital teaching object

Use the digital teaching object on the Teacher Dashboard to introduce the key mathematical concepts and language.

Introductory activity: Identifying attributes

Before students start to choose and sort items, spend time ensuring that they have a good understanding of a range of attributes. Place an everyday item that students are familiar with into a feely bag. Give a clue to students about a particular feature of the item (its shape, colour or what it's made from) and invite them to guess what it is. Give further clues, and then allow a student to look into the bag to confirm what it is. Repeat with other items, emphasising the attributes you're describing. For example: The last item was red. The colour of this item is silver.

As students gain confidence, you may like to give them a turn at selecting the item and giving some clues.

Introductory activity: Sorting and re-sorting

Give each student a selection of beads and a piece of string. Ask them to sort the beads in any way they like, then share their chosen attribute with a partner. Invite students to re-sort their beads according to a different attribute and explain how they sorted them to the same partner. Model making a necklace with beads of a single attribute, such as all the red beads or all the square beads. Ask students to make their own necklace with beads of a chosen attribute, and then have the class guess which attribute each student chose.

Session 3: Instruction and consolidation

Whole class

Topic exploration: Conducting a simple sort

Give each student some animal counters or plastic animals, as well as plastic bowls. Allow them to experiment with sorting the items into the bowls. Then ask students to share how they decided to divide the items up. Students may have sorted by colour, put particular numbers of items in each bowl, or even randomly shared the items out – at this stage, the emphasis is on students articulating their thinking.

Tell students that the animals can only live with animals that are the same. Can they sort the animals into groups based on this criterion? Ask students to describe how they sorted their animals and use this to lead into a discussion of other attributes that you can sort by, such as colour or size.

Student book

As a class, complete the Guided Practice activity on p. 62. Support students to recognise the three basic shapes of squares, triangles and circles, and work through the instructions step by step. Explain the Independent Practice activities on pp. 63–64.

At-standard and extension groups

Student book

Students to complete: Independent Practice activities, pp. 63–64. Students can work with a partner if required. In pairs, ask early finishers to choose an item from the classroom and discuss how their items are the same and how they are different. Allow time for students to share their findings.

Support group

Concept exploration and skill development: Matching attributes to items

Seat the group in a circle on the floor with a large supply of attribute blocks in the centre. Choose one item and brainstorm its features (such as size, colour and thickness) as a group, prompting the students to recognise any that they don't immediately suggest. Once students are familiar with the possible attributes, play a game of *Who am I?*. Choose a particular block without telling the students what it is and begin to describe it. For example: "I have four corners. I am thick. I am large". As soon as students think they know which block you're talking about, they take it from the pile in the middle. Discuss the fact that each block has several attributes and so it's difficult to make a good guess with only one or two clues. Students could also take a turn at describing a block for their classmates to guess.

Student book with teacher support

Students to complete: Independent Practice activities, p. 63. You may choose to invite students from the other groups who struggled with the activities to join you. Work through each activity as a group, discussing how to recognise particular attributes and allowing students to articulate their thinking.

Session 4: Instruction and consolidation

Whole class

Topic exploration: Exploring attributes

Students each choose a picture storybook from your class library and sit in a circle with the book in front of them. Suggest a way to group some of the books using one attribute, e.g. you might gather all the pink books. Ask students to suggest how you grouped the books, then return each one to the students who chose them. Invite students to suggest other ways to group the books, such as books with cartoons, books with hard covers or books with an "a" somewhere on the front. Conduct the sort for each of their suggestions.

At-standard group

Teacher activity: Sorting by an attribute

To help students focus on particular attributes, organise the group in a circle with a selection of attribute blocks in the centre. Choose an attribute such as colour or thickness and start collecting all the items that have that attribute. Can students guess what the attribute is? Give pairs of students some attribute blocks and instruct them to take turns to pick out blocks with a particular attribute while their partner guesses how the blocks are being sorted.

Student book

Students to complete: Extended Practice activities, p. 65.

Support group

Student book with teacher support

Students to complete: Independent and Extended Practice activities, pp. 64–65. Check-in with students as they work through the Independent Practice activities, discussing any difficulties, before supporting them to complete the Extended Practice activities, using attribute blocks to physically sort the items if required.

Extension group

Student book

Students to complete: Extended Practice activities, p. 65.

Extension activity

In pairs, give students a deck of playing cards and ask them to sort the cards in as many different ways as they can. Encourage students to share their findings at the end of the session.

Session 5: Post-assessment

Students to complete: Assessment book, Post-test 9, Unit 4, Topic 1, p. 19. (Alternatively, you can download the test from the **Planning & Assessment** section of the Teacher Dashboard.) Read the questions aloud to students as a whole class or in small groups.

oxford maths

Oxford Maths Year 1 Suggested Term Planner

Term 1

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1–2	1. Number and place value	1. 2-digit numbers	Read, write, represent and order up to 2-digit numbers	6–10	2–3
3	9. Chance	1. Chance	Identify and explain the likelihood of familiar events using the language of probability	113–117	32–33
4	1. Number and place value	2. Reading and writing numbers	Write and recognise numbers in words and numerals	11–14	2–3
5	5. Using units of measurement	3. Mass	Use a balance scale to compare and order the masses of common objects	77–80	20–21
6–7	1. Number and place value	3. Ordering numbers	Explore the relative size of 2-digit numbers	15–18	2–3
8	4. Patterns and algebra	1. Patterns	Explore, describe, continue and complete simple patterns with objects	59–62	14–15
9	6. Shape	1. 2D shapes	Recognise and name common two- dimensional shapes and explore their properties	89–92	24–25

oxford maths

Oxford Maths Year 1 Suggested Term Planner

Term 2

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1	1. Number and place value	4. Counting on	Use counting on to solve simple addition problems	19–22	4–5
2–3	5. Using units of measurement	1. Length and area	Estimate, measure and compare the length and area of familiar objects using uniform informal units	67–71	16–17
4–5	1. Number and place value	5. Partitioning	Explore partitioning of 1- and 2-digit numbers	23–26	4–5
6–7	7. Location and transformation	1. Position 2. Directions	Explore the language of location to accurately describe and interpret position Give and follow simple directions using appropriate language	97–100 101–104	28–29
8	1. Number and place value	6. Counting back	Use counting back to solve simple subtraction problems	27–30	6–7
9	2. Fractions and decimals	1. Fractions of a whole	Investigate numerical and visual representations of halves and quarters of whole objects and shapes in context	43–46	10–11

oxford maths

Oxford Maths Year 1 Suggested Term Planner

Term 3

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1–2	1. Number and place value	7. Difference between	Explore difference between using counting up and counting back strategies	31–34	6–7
3–4	5. Using units of measurement	4. Telling time	Read and represent analogue time to the half hour	81–84	22–23
5	1. Number and place value	8. Skip counting	Explore skip counting sequences by 2, 5 and 10	35–38	8–9
6–7	6. Shape	2. 3D objects	Investigate and classify common three-dimensional objects according to their faces, corners and edges	93–96	26–27
8	4. Patterns and algebra	2. Number patterns	Explore, describe, continue and complete simple number patterns and practise counting by 2, 5 and 10	63–66	14–15
9	5. Using units of measurement	5. Duration	Understand basic units of time and estimate the duration of familiar events	85–88	22–23

oxford maths

Oxford Maths Year 1 Suggested Term Planner

Term 4

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1	1. Number and place value	9. Equal shares	Understand the concept of equal shares in simple division problems	39–42	8–9
2	2. Fractions and decimals	2. Fractions of a group	Investigate numerical and visual representations of halves and quarters of collections	47–50	10–11
3–5	8. Data representation and interpretation	1. Representing data 2. Interpreting data	Explore efficient data collection, recording and representation methods Make simple inferences from given and collected data	105–108 109–112	30–31
6–7	3. Money and financial mathematics	1. Recognising Australian coins 2. Ordering coins	Describe the properties of Australian coins including size, colour and design Order Australian coins according to value and other properties	51–54 55–58	12–13
8–9	5. Using units of measurement	2. Volume and capacity	Estimate, measure and compare the volume and capacity of common objects using uniform informal units. Understand the difference between volume and capacity	72–76	18–19

Oxford Maths Year 1 Learning sequence

Curriculum links

Australian Curriculum

Investigate and describe number patterns formed by skip counting and patterns with objects (ACMNA018)

Develop confidence with number sequences to and from 100 by ones from any starting point. Skip count by twos, fives and tens starting from zero (ACMNA012)

Victorian Curriculum

Investigate and describe number patterns formed by skip counting and patterns with objects (VCMNA093)

Develop confidence with number sequences to and from 100 by ones from any starting point. Skip count by twos, fives and tens starting from zero (VCMNA086)

Recognise the importance of repetition of a process in solving problems (VCMNA094)

NSW Syllabus

MA1-8NA creates, represents and continues a variety of patterns with numbers and objects

Learning focus

Explore, describe, continue and complete simple number patterns and practise counting by two, five and 10

Materials

- clear counters
- egg cartons or ice cube trays
- plastic bears or other counting materials
- calculators
- *BLM 16: 0 to 99 chart*
- *Activity sheet 15: Making and describing number patterns*

Potential difficulties: Counting sequences

It takes time for students to confidently and accurately skip count without relying on concrete materials as a prompt.

- Provide opportunities for students to develop recall of skip counting by twos, fives and 10s by practising rhythmic counting together regularly. Ensure that students articulate the numbers correctly and that they can connect their oral counting with numbers on a hundred chart.
- Reinforce the concept by asking questions such as: What number are you adding on each time? What will the next number be?

Daily practice activity

Start a sound pattern (such as *clap*, *tap*, *stamp*) and ask students to join in when they've identified the sequence. As the week goes on, invite students to invent the sound pattern for others to join in.

Session 1: Pre-assessment

Students to complete: Assessment book, Pre-test 7, Unit 4, Topic 2, p. 14. (Alternatively, you can download the test from the **Planning & Assessment** section of the Teacher Dashboard.)

Session 2: Topic introduction

Whole class

Digital teaching object

Use the digital teaching object on the Teacher Dashboard to introduce the key mathematical concepts and language.

Introductory activity: Exploring counting patterns

In mixed-ability pairs, give students some clear counters and an enlarged copy of *BLM 16: 0 to 99 chart*. Ask students to skip count by twos, placing a counter on each number that they say. As a class, discuss both the visual and the number patterns formed. Can students predict what the next number in the sequence would be? Repeat with skip counting by five and 10.

At-standard group

Student book

Students to complete: Guided and Independent Practice activities, pp. 63–65. Ask early finishers to put a cross on all the numbers counting by 3 to 100 on the hundred chart in question 3, p. 65. Then ask students to discuss the pattern this made with a partner.

Support group

Concept exploration and skill development: Counting materials

It's important that students are not merely repeating the sequence by rote, but that they understand the meaning of what they're saying when they skip count. To help them understand how to apply skip counting, give pairs of students an egg carton or ice cube tray and some plastic bears or other counting materials. Direct students to put five bears in each hole, then use skip counting to find the total. Watch for students who go back and try to count each bear singly, rather than skip counting. Repeat with two or 10 bears in each hole. Extend students' thinking by asking them to put five bears in three of the holes and to skip count to find the total.

Student book with teacher support

Students to complete: Guided Practice activities, p. 63. Help students to highlight the final digit in each number of the counting sequence to make the pattern more obvious.

Extension group

Student book

Students to complete: Guided and Independent Practice activities, pp. 63–65.

Activity sheet

Students to begin: *Activity sheet 15: Making and describing number patterns*. You can download this from the **Resources** section of the Teacher Dashboard.

Session 3: Instruction and consolidation

Whole class

Topic exploration: Number patterns and calculators

Calculators provide a unique opportunity for students to observe counting patterns in a different context. Using a calculator on an interactive, display the numeral 0 in the window and then write it on the board. (Alternatively, access an online calculator) Enter **+ 2 =** on the calculator and write the result on the board. Can students explain why the answer is 2? Press **=** again and record the answer on the board. Ask students to explain why pressing = resulted in a change in the answer. Can students predict what number will be displayed if you press = again? Continue adding 2, recording each number and discussing the emerging pattern.

In mixed-ability pairs, ask students to repeat the process by adding 5 each time. Encourage students to predict what the answer will be each time they press =. Conduct the activity again, this time adding 10.

At-standard group

Teacher activity: Investigating patterns

Students often benefit from a visual representation of pattern. Using an interactive whiteboard or an enlarged copy of *BLM 16: 0 to 99 chart*, ask students to identify and colour the repeating part of the pattern when you skip count by 10. Challenge their thinking by examining what happens when you count by 10 off the decade. Repeat with counting by 5 and 2, exploring the patterns associated with non-zero starting points if students are ready for it. Which counting sequence has the longest pattern?

In pairs, give students a copy of BLM 16 and invite them to circle numbers in a pattern of their choice. Allow time for students to share what they discovered.

Student book

Students to complete: Extended Practice activities, p. 66.

Support group

Student book with teacher support

Students to complete: Independent and Extended Practice activities, pp. 64–66. Check-in with students as they work through the Independent Practice activities, discussing any difficulties, before supporting them to complete the Extended Practice, helping them to link the counting patterns beyond 100 with their knowledge of counting patterns on the hundred chart.

Extension group

Student book

Students to complete: Extended Practice activities, p. 66.

Activity sheet

Students to complete: *Activity sheet 15: Making and describing number patterns*. You can download this from the **Resources** section of the Teacher Dashboard.

Session 4: Post-assessment

Students to complete: Assessment book, Post-test 7, Unit 4, Topic 2, p. 15. (Alternatively, you can download the test from the **Planning & Assessment** section of the Teacher Dashboard.)

oxford maths

Oxford Maths Year 2 Suggested Term Planner

Term 1

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1–2	1. Number and place value	1. Place value	Read, write, represent and order numbers up to 3-digits	6–9	2–3
3	9. Chance	1. Chance	Explore, compare and evaluate the likelihood of familiar events using the language of probability	125–128	38–39
4–5	1. Number and place value	2. Adding in your head	Explore and choose appropriate mental addition strategies such as doubles and getting to a 10 to solve addition problems	10–14	4–5
6–7	1. Number and place value	4. Subtracting in your head	Explore and choose appropriate mental subtraction strategies such as getting to a 10 and counting up to solve subtraction problems	21–25	6–7
8–9	5. Using units of measurement	1. Length and area	Estimate, measure and compare the length an d area of familiar objects using uniform informal units	64–67	18–19
		2. Metres and centimetres	Estimate, measure and compare lengths using centimetres and metres	68–72	

oxford maths

Oxford Maths Year 2 Suggested Term Planner

Term 2

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1–2	1. Number and place value	3. Exploring addition	Explore and choose appropriate written addition strategies such as number lines and horizontal addition to solve addition problems	15–20	4–5
3	5. Using units of measurement	4. Mass	Estimate and compare the mass of familiar objects using balance scales	77–80	22–23
4	2. Fractions and decimals	1. Fractions of a whole	Investigate numerical and visual representations of halves, quarters and eighths of whole objects and shapes in context	40–43	12–13
5–6	1. Number and place value	5. Exploring subtraction	Explore the choose appropriate written subtraction strategies such as number lines and horizontal subtraction to solve subtraction problems	26–31	6–7
7	4. Patterns and algebra	1. Describing patterns	Explore, describe, continue and complete number patterns	56–59	16–17
8	7. Location and transformation	1. Interpreting maps	Describe and interpret the position of objects and places on maps and in everyday contexts	101–104	32–33
9	6. Shape	1. 2D shapes	Identify and represent two-dimensional shapes according to their characteristics	93–96	28–29

oxford maths

Oxford Maths Year 2 Suggested Term Planner

Term 3

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1–2	1. Number and place value	6. Multiplying	Use arrays and number lines to explore multiplication and repeated addition	32–35	8–9
3	5. Using units of measurement	5. Time	Explore digital, analogue and written representations of time to the quarter hour	81–84	24–25
4–5	1. Number and place value	7. Dividing	Explore division and repeated subtraction supported by visual cues	36–39	10–11
6	2. Fractions and decimals	2. Fractions of groups	Investigate numerical and visual representations of halves, quarters and eighths of collections	44–47	12–13
7–8	7. Location and transformation	2. Slides and flips	Investigate, describe and represent the effects of translation and reflection transformations on shapes	105–108	34–35
		3. Half turns and quarter turns	Identify, describe and represent the effect of the rotation transformation for half and quarter turns	109–112	
9	6. Shape	2. 3D objects	Explore, identify and describe common characteristics of three-dimensional objects	97–100	30–31

oxford maths

Oxford Maths Year 2 Suggested Term Planner

Term 4

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1	4. Patterns and algebra	2. Number sentences	Represent and solve addition and subtraction problems using number sentences	60–63	16–17
3–5	8. Statistics and probability	1. Collecting data 2. Collecting and classifying data 3. Representing and interpreting data	Explore and apply data collection and recording methods Use effective methods to record and sort data, including lists and tally marks Construct and interpret data displays including picture graphs and tables	113–116 117–120 121–125	36–37
5–6	3. Money and financial mathematics	1. Notes and coins 2. Counting money	Recognise, sort, count and calculate with Australian notes and coins Count, calculate and problem-solve with Australian coins	48–51 52–55	14–15
7	5. Using units of measurement	3. Volume and capacity	Estimate, measure and compare volume and capacity using uniform informal units. Understand the difference between volume and capacity	73–76	20–21
8–9	5. Using units of measurement	6. Months and seasons 7. Calendars	Understand the months and characteristics of seasons and compare cultural interpretations of seasons in Australia Read and interpret calendars and explore similarities and differences between months	85–88 89–92	25–25 26–27

Year 2 Learning sequence

Curriculum links

Australian Curriculum

Describe, continue, and create number patterns resulting from performing addition or subtraction (ACMNA060)

Victorian Curriculum

Describe, continue, and create number patterns resulting from performing addition or subtraction (VCMNA138)

Use a function machine and the inverse machine as a model to apply mathematical rules to numbers or shapes (VCMNA139)

NSW Syllabus

MA2-8NA generalises properties of odd and even numbers, generates number patterns, and completes simple number sentences by calculating missing values

Learning focus

Follow and create rules for number patterns and identify missing numbers based on function machine rules

Materials

- counters
- poster paper
- *BLM 3: 0–99 chart*
- *Activity sheet 14: Using numbers to make patterns*

Potential difficulties: Visualising patterns

Students who have difficulty with pattern work are often moved on from concrete materials too quickly.

- Allow students to physically model number patterns using manipulatives or on a computer to connect a more abstract number pattern, such as “add 3, take away 1”, with a visual representation. Students can see that the items in the pattern are increasing then decreasing, as well as understanding that the numbers themselves are increasing and decreasing.

- As students' confidence grows, gradually reduce the use of manipulatives.

Daily practice activity

Compile a list of patterns that students find throughout the week. These may be visual patterns or number patterns. Encourage students to consider what the patterns would look like if they were continued.

Session 1: Pre-assessment

Students to complete: Assessment book, Pre-test 9, Unit 4, Topic 1, p. 18. (Alternatively, you can download the test from the **Planning & Assessment** section of the Teacher Dashboard.)

Session 2: Topic introduction

Whole class

Digital teaching object

Use the digital teaching object on the Teacher Dashboard to introduce the key mathematical concepts and language.

Introductory activity: Analysing patterns

Students may not have been taught how to identify the rule for a pattern, so it's useful to model this process on a whiteboard for them. Write a pattern such as 2, 6, 10, 14 and ask students to first identify if the pattern is going forwards or backwards. Next, ask them to find the difference between the first two numbers in the pattern, then between the next two numbers. Is the difference the same? Repeat for the next two numbers. Students can now be confident that they have identified the rule – adding 4 each time. Ask students to identify the next three numbers in the pattern.

Write some more number patterns on the board and, in pairs, ask students to identify whether each pattern is going forwards or backwards, and the difference between the numbers, to find and write the rule. Students can then work out the next three numbers in the pattern. As a class, write some guidelines for identifying number pattern rules.

At-standard group

Student book

Students to complete: Guided and Independent Practice activities, pp. 60–62. Ask early finishers to write a rule for their own function machine, similar to the ones in question 2 on p. 61. On a separate piece of paper, ask students to draw their function machine with a set of "in and out" numbers based on their rule. Students can then swap with a partner to identify the rule, or alternatively, present their function machines to the class.

Support group

Concept exploration and skill development: Patterns on a number chart

Number charts can provide visual support as students are learning about patterns. Give pairs of students an enlarged copy of *BLM 3: 0–99 chart* and some counters. Ask students to put a counter on the start number of 2, then write the rule “Add 3” on the board. As a group, identify the first three numbers in the pattern, putting a counter on each, then have each pair continue marking out the pattern with counters. Stop them when they reach halfway and ask them what they notice. Can they guess the next number without counting on another 3? Repeat the process using a start number of 97 and a rule of “Subtract 5”, again allowing students to discuss the visual pattern. What do they notice about the number pattern?

Give each group of students a different start number and the same rule, such as “Add 4”. How are their visual patterns similar? How do their number patterns compare? Repeat with a subtraction rule to consolidate students’ understanding.

Student book with teacher support

Students to complete: Guided Practice activities, p. 60. Encourage students to use their copy of BLM 3 and counters to explore the patterns if required.

Extension group

Student book

Students to complete: Guided and Independent Practice activities, pp. 60–62.

Activity sheet

Students to begin: *Activity sheet 14: Using numbers to make patterns*. You can download this from the **Resources** section of the Teacher Dashboard.

Session 3: Instruction and consolidation

Whole class

Topic exploration: Pattern types

There are many different types of number patterns. The more patterns students are familiar with, the easier they will find it to identify and continue patterns. As a class, brainstorm different number patterns that students are aware of, such as counting patterns, doubling patterns, addition patterns or subtraction patterns, recording some examples of each. If necessary, prompt students by modelling growing patterns, repeating patterns or other pattern types. Are students aware of patterns such as extending numbers, e.g. 3 + 4 = 7, 30 + 40 = 70, 300 + 400 = 700?

Put students into small groups and allocate each group one pattern type. Students should create a poster explaining their allocated pattern and including some visual and number examples of the patterns. Display the finished posters around the classroom.

At-standard group

Teacher activity: Creating number patterns

Tables are often used to record the relationships between numbers in a pattern. Draw a simple table on the whiteboard that shows how many wings are on different numbers of birds.

Number of birds	1	2	3
Number of wings	2	4	6

Invite students to describe the relationship between each pair of numbers in the table and use this information to work out how many wings would be on a larger number of birds, such as 12.

In pairs, ask students to use a table to create their own number patterns to show the relationship between two numbers, such as the number of wheels on different numbers of cars or the number of legs on different numbers of cows or ants. Students can write challenge questions that involve using the number pattern in the table to solve problems about larger numbers of items, then give their questions to another pair to answer. Finish the session by asking students to write a rule to go with their number patterns.

Student book

Students to complete: Extended Practice activities, p. 63.

Support group

Student book with teacher support

Students to complete: Independent and Extended Practice activities, pp. 61–63. Check-in with students as they work through the Independent Practice activities, discussing any difficulties, before supporting them to complete the Extended Practice, encouraging them to verbalise whether each step of the pattern is going forwards or backwards, and by how much, to identify the rule.

Extension group

Student book

Students to complete: Extended Practice activities, p. 63.

Activity sheet

Students to complete: *Activity sheet 14: Using numbers to make patterns*. You can download this from the **Resources** section of the Teacher Dashboard.

Session 4: Post-assessment

Students to complete: Assessment book, Post-test 9, Unit 4, Topic 1, p. 19. (Alternatively, you can download the test from the **Planning & Assessment** section of the Teacher Dashboard.)

OXFORD
UNIVERSITY PRESS
AUSTRALIA & NEW ZEALAND

oxford maths

Oxford Maths Year 3 Suggested Term Planner

Term 1

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1–2	1. Number and place value	1. Place value	Read, write, represent and order numbers up to 4 digits	6–9	2–3
3	1. Number and place value	3. Addition mental strategies	Explore and choose appropriate mental addition strategies such as the split strategy and extending number facts to solve addition problems	14–17	4–5
4	5. Using units of measurement	4. Time	Record and interpret digital and analogue time to the minute. Convert between common units of time	82–85	26–27
5–6	1. Number and place value	4. Addition written strategies	Explore and choose appropriate written addition strategies such as the jump strategy and vertical addition to solve addition problems	18–22	4–5
7	6. Shape	1. 2D shapes	Explores, describes and classifies 2D shapes according to their features	86–89	28–29
8–9	2. Fractions and decimals	1. Fractions 2. Fractions on number lines	Interpret, identify and represent unit fractions and their multiples Use number lines to count by unit fractions and compare the size of different fractions	48–51 52–55	14–15

oxford maths

Oxford Maths Year 3 Suggested Term Planner

Term 2

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1	1. Number and place value	5. Subtraction mental strategies	Explore and choose appropriate mental subtraction strategies such as extending number facts and getting to a 10 to solve subtraction problems	23–26	6–7
2–3	5. Using units of measurement	1. Length and area	Estimate, measure and compare lengths using centimetres. Estimate, measure and compare areas using square centimetres and square metres	68–72	20–21
4–5	1. Number and place value	6. Subtraction written strategies	Explore and choose appropriate written subtraction strategies such as the jump strategy and vertical subtraction to solve subtraction problems	27–31	6–7
6	7. Geometric reasoning	1. Angles	Compare and classify angles in shapes and the environment in relation to a right angle	94–97	32–33
7	1. Number and place value	2. Odd and even	Understand the properties and associated number patterns of odd and even numbers	10–13	2–3
8	8. Location and transformation	2. Slides and turns	Identify, classify and represent slide and turn transformations	102–105	34–35
9	4. Patterns and algebra	1. Number patterns	Follow and create rules for number patterns and identify missing numbers based on function machine rules	60–63	18–19

oxford maths

Oxford Maths Year 3 Suggested Term Planner

Term 3

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1	1. Number and place value	8. Multiplication and division facts	Investigate the relationship between multiplication and division facts and use them to problem solve	36–39	10–11
2	8. Location and transformation	1. Symmetry	Classify items as symmetrical or not symmetrical and identify lines of symmetry	98–101	34–35
3	1. Number and place value	7. Inverse operations	Explore the connection between addition and subtraction and identify related fact families	32–35	8–9
4–5	1. Number and place value	10. Multiplication written strategies	Explore and choose appropriate written multiplication strategies such as the split strategy and the grid method to solve problems involving one- and two-digit numbers	44–47	12–13
6–8	9. Data representation and interpretation	1. Collecting data	Explore and choose appropriate data sources to collect and classify data	110–113	38–39
		2. Graphs	Understand and use the features of common of data displays such as picture and column graphs	114–117	
		3. Interpreting data	Draw conclusions from data presented in graphs, and compare the effectiveness of different data displays	118–121	
9	4. Patterns and algebra	2. Problem solving	Interpret, represent and solve word problems, and find missing numbers to balance equations	64–67	18–19

oxford maths

Oxford Maths Year 3 Suggested Term Planner

Term 4

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1–2	1. Number and place value	9. Multiplication and division mental strategies	Explore and choose appropriate mental multiplication and division strategies such as doubling, halving and using known number facts	40–43	10–11
3	6. Shape	2. 3D objects	Recognise, describe and draw 3D objects according to their features and the 2D shapes that make them up	90–93	30–31
4–5	10. Chance	1. Chance events 2. Chance experiments	Identify possible outcomes of chance events and classify events using the language of probability Conduct multiple chance experiments and predict and compare the results	122–125 126–129	40–41
6	3. Money and financial mathematics	1. Money	Explore different combinations of coins to make a total, calculate change and round to the nearest five cents	56–59	16–17
7	5. Using units of measurement	3. Mass	Estimate and measure masses using grams and kilograms. Compare and classify the mass of common items in relation to 1 kg and 500 g	78–81	24–25
8	8. Location and transformation	3. Grids and maps	Use grid references to interpret and create simple maps	106–109	36–37
9	5. Using units of measurement	2. Volume and capacity	Estimate, measure and compare volume and capacity using cubic centimetres, litres and millilitres	73–77	22–23

oxford maths for australian schools

Year 3 Learning sequence

Curriculum links

Australian Curriculum

Describe, continue, and create number patterns resulting from performing addition or subtraction (ACMNA060)

Victorian Curriculum

Describe, continue, and create number patterns resulting from performing addition or subtraction (VCMNA138)

Use a function machine and the inverse machine as a model to apply mathematical rules to numbers or shapes (VCMNA139)

NSW Syllabus

MA2-8NA generalises properties of odd and even numbers, generates number patterns, and completes simple number sentences by calculating missing values

Learning focus

Follow and create rules for number patterns and identify missing numbers based on function machine rules

Materials

- counters
- poster paper
- *BLM 3: 0–99 chart*
- *Activity sheet 14: Using numbers to make patterns*

Potential difficulties: Visualising patterns

Students who have difficulty with pattern work are often moved on from concrete materials too quickly.

- Allow students to physically model number patterns using manipulatives or on a computer to connect a more abstract number pattern, such as “add 3, take away 1”, with a visual representation. Students can see that the items in the

pattern are increasing then decreasing, as well as understanding that the numbers themselves are increasing and decreasing.
- As students' confidence grows, gradually reduce the use of manipulatives.

Daily practice activity

Compile a list of patterns that students find throughout the week. These may be visual patterns or number patterns. Encourage students to consider what the patterns would look like if they were continued.

Session 1: Pre-assessment

Students to complete: Assessment book, Pre-test 9, Unit 4, Topic 1, p. 18. (Alternatively, you can download the test from the **Planning & Assessment** section of the Teacher Dashboard.)

Session 2: Topic introduction

Whole class

Digital teaching object

Use the digital teaching object on the Teacher Dashboard to introduce the key mathematical concepts and language.

Introductory activity: Analysing patterns

Students may not have been taught how to identify the rule for a pattern, so it's useful to model this process on a whiteboard for them. Write a pattern such as 2, 6, 10, 14 and ask students to first identify if the pattern is going forwards or backwards. Next, ask them to find the difference between the first two numbers in the pattern, then between the next two numbers. Is the difference the same? Repeat for the next two numbers. Students can now be confident that they have identified the rule – adding 4 each time. Ask students to identify the next three numbers in the pattern.

Write some more number patterns on the board and, in pairs, ask students to identify whether each pattern is going forwards or backwards, and the difference between the numbers, to find and write the rule. Students can then work out the next three numbers in the pattern. As a class, write some guidelines for identifying number pattern rules.

At-standard group

Student book

Students to complete: Guided and Independent Practice activities, pp. 60–62. Ask early finishers to write a rule for their own function machine, similar to the ones in question 2 on p. 61. On a separate piece of paper, ask students to draw their function machine with a set of "in and out" numbers based on their rule. Students

can then swap with a partner to identify the rule, or alternatively, present their function machines to the class.

Support group

Concept exploration and skill development: Patterns on a number chart

Number charts can provide visual support as students are learning about patterns. Give pairs of students an enlarged copy of *BLM 3: 0–99 chart* and some counters. Ask students to put a counter on the start number of 2, then write the rule “Add 3” on the board. As a group, identify the first three numbers in the pattern, putting a counter on each, then have each pair continue marking out the pattern with counters. Stop them when they reach halfway and ask them what they notice. Can they guess the next number without counting on another 3? Repeat the process using a start number of 97 and a rule of “Subtract 5”, again allowing students to discuss the visual pattern. What do they notice about the number pattern?

Give each group of students a different start number and the same rule, such as “Add 4”. How are their visual patterns similar? How do their number patterns compare? Repeat with a subtraction rule to consolidate students’ understanding.

Student book with teacher support

Students to complete: Guided Practice activities, p. 60. Encourage students to use their copy of BLM 3 and counters to explore the patterns if required.

Extension group

Student book

Students to complete: Guided and Independent Practice activities, pp. 60–62.

Activity sheet

Students to begin: *Activity sheet 14: Using numbers to make patterns*. You can download this from the **Resources** section of the Teacher Dashboard.

Session 3: Instruction and consolidation

Whole class

Topic exploration: Pattern types

There are many different types of number patterns. The more patterns students are familiar with, the easier they will find it to identify and continue patterns. As a class, brainstorm different number patterns that students are aware of, such as counting patterns, doubling patterns, addition patterns or subtraction patterns, recording some

examples of each. If necessary, prompt students by modelling growing patterns, repeating patterns or other pattern types. Are students aware of patterns such as extending numbers, e.g. 3 + 4 = 7, 30 + 40 = 70, 300 + 400 = 700?

Put students into small groups and allocate each group one pattern type. Students should create a poster explaining their allocated pattern and including some visual and number examples of the patterns. Display the finished posters around the classroom.

At-standard group

Teacher activity: Creating number patterns

Tables are often used to record the relationships between numbers in a pattern. Draw a simple table on the whiteboard that shows how many wings are on different numbers of birds.

Number of birds	1	2	3
Number of wings	2	4	6

Invite students to describe the relationship between each pair of numbers in the table and use this information to work out how many wings would be on a larger number of birds, such as 12.

In pairs, ask students to use a table to create their own number patterns to show the relationship between two numbers, such as the number of wheels on different numbers of cars or the number of legs on different numbers of cows or ants. Students can write challenge questions that involve using the number pattern in the table to solve problems about larger numbers of items, then give their questions to another pair to answer. Finish the session by asking students to write a rule to go with their number patterns.

Student book

Students to complete: Extended Practice activities, p. 63.

Support group

Student book with teacher support

Students to complete: Independent and Extended Practice activities, pp. 61–63. Check-in with students as they work through the Independent Practice activities, discussing any difficulties, before supporting them to complete the Extended Practice, encouraging them to verbalise whether each step of the pattern is going forwards or backwards, and by how much, to identify the rule.

Extension group

Student book

Students to complete: Extended Practice activities, p. 63.

Activity sheet

Students to complete: *Activity sheet 14: Using numbers to make patterns*. You can download this from the **Resources** section of the Teacher Dashboard.

Session 4: Post-assessment

Students to complete: Assessment book, Post-test 9, Unit 4, Topic 1, p. 19. (Alternatively, you can download the test from the **Planning & Assessment** section of the Teacher Dashboard.)

oxford maths

Oxford Maths Year 4 Suggested Term Planner

Term 1

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1–2	1. Number and place value	1. Place value	Read, write, represent and order numbers up to 5 digits	6–9	2–3
3	1. Number and place value	3. Addition mental strategies	Explore and choose appropriate mental addition strategies such as empty number lines and reordering numbers to solve addition problems	14–17	4–5
4	5. Using units of measurement	1. Length	Estimate, measure and compare lengths using centimetres and millimetres and convert between the units	69–72	20–21
5–6	1. Number and place value	4. Addition written strategies	Explore and choose appropriate written addition strategies such as the split strategy and vertical addition to solve addition problems	18–22	4–5
7	6. Shape	1. 2D shapes	Identify and describe common features of 2D shapes. Investigate the effects of combining or splitting shapes	93–96	30–31
8–9	2. Fractions and decimals	1. Equivalent fractions 2. Improper fractions and mixed numbers	Use diagrams and fraction walls to investigate and identify equivalent fractions Understand and convert between fractions and mixed numbers using number lines and diagrams	45–48 49–52	12–13

oxford maths

Oxford Maths Year 4 Suggested Term Planner

Term 2

Weeks	Unit	Topic	Focus	Student Book pages	Assessment book pages
1	1. Number and place value	5. Subtraction mental strategies	Explore and choose appropriate mental subtraction strategies such as the compensation strategy and rounding to solve subtraction problems	23–26	6–7
2–3	5. Using units of measurement	6. Time	Investigate and record am and pm time to the minute. Convert between common units of time	89–92	28–29
4–5	1. Number and place value	6. Subtraction written strategies	Explore and choose appropriate written subtraction strategies such as the split strategy and vertical subtraction to solve subtraction problems	27–31	6–7
6	7. Geometric reasoning	1. Angles	Explore common angle types and describe them in relation to a right angle	101–104	32–33
7	1. Number and place value	2. Odd and even	Understand the properties of odd and even numbers and how this knowledge can help with checking calculations	10–13	2–3
8	5. Using units of measurement	2. Area	Estimate, measure and compare areas using square centimetres and square metres	73–76	20–21
9	4. Patterns and algebra	1. Number patterns	Explore, complete and identify rules for number patterns and identify multiples of given numbers	61–64	18–19

oxford maths

Oxford Maths Year 4 Suggested Term Planner

Term 3

Weeks	Unit	Topic	Focus	Student Book pages	Assessment book pages
1	1. Number and place value	Multiplication and division facts	Use arrays and number charts to explore the connection between multiplication and division and learn related number facts	32–35	8–9
2	8. Location and transformation	Symmetry	Use transformations to investigate and create symmetrical patterns	105–108	34–35
3	2. Fractions and decimals	Decimal fractions	Read, write and interpret numbers to hundredths, and convert between decimals and fractions	53–56	14–15
4–5	1. Number and place value	Multiplication written strategies	Explore and choose appropriate written multiplication strategies such as extended and contracted multiplication to solve problems involving one– and two–digit numbers	36–40	10–11
6–7	9. Data representation and interpretation	Collecting data Displaying and interpreting data	Construct appropriate questions to collect data using methods such as surveys. Use efficient methods to record collected data Construct and interpret data displays including picture graphs, column graphs and tables using given and collected data. Analyse the effectiveness of data displays	113–116 117–120	38–39
8	5. Using units of measurement	Volume and capacity	Estimate, measure and compare volume and capacity using cubic centimetres, litres and millilitres. Convert between litres and millilitres	77–80	22–23
9	4. Patterns and algebra	Problem solving	Interpret, represent and solve word problems involving the four processes	65–68	18–19

oxford maths

Oxford Maths Year 4 Suggested Term Planner

Term 4

Weeks	Unit	Topic	Focus	Student Book pages	Assessment book pages
1–2	1. Number and place value	9. Division written strategies	Explore and choose appropriate written division strategies such as short division to solve problems involving one– and two–digit numbers	41–44	10–11
3	6. Shape	2. 3D objects	Identify and describe 3D objects including top, front and side views. Sketch and name common 3D objects	97–100	30–31
4–5	10. Chance	1. Chance events 2. Chance experiments	Compare, rank and evaluate the likelihood of common events Predict and explore the possible outcomes of chance experiments and evaluate the effects of one event on another	121–124 125–128	40–41
6	3. Money and financial mathematics	1. Money and money calculations	Round money amounts to the nearest five cents and calculate money totals and change	57–60	16–17
7	5. Using units of measurement	4. Mass	Estimate, measure and compare masses using grams and kilograms. Convert between the units	81–84	24–25
8	8. Location and transformation	2. Scales and maps	Interpret and create maps using scales and legends, and follow directions involving compass points	109–112	36–37
9	5. Using units of measurement	5. Temperature	Read and record temperatures on thermometers and measure and compare the temperature of familiar items and places	85–88	26–27

Year 4 Learning sequence

Curriculum links

Australian Curriculum

Explore and describe number patterns resulting from performing multiplication (ACMNA081)

Victorian Curriculum

Explore and describe number patterns resulting from performing multiplication (VCMNA161)

Define a simple class of problems and solve them using an effective algorithm that involves a short sequence of steps and decisions (VCMNA164)

NSW Syllabus

MA2-8NA generalises properties of odd and even numbers, generates number patterns, and completes simple number sentences by calculating missing values

Learning focus

Explore, complete and identify rules for number patterns and identify multiples of given numbers

Materials

- blank calendar page for the current month, one per pair (or access to an online version)
- hundred chart and counters (optional)
- craft sticks or similar construction materials
- glue
- *BLM 18: Exploring number patterns*
- *BLM 19: Number pattern record sheet*
- *Activity sheet 14: Patterns with numbers*

Activity sheet materials

- a calculator
- a pencil and ruler

Potential difficulties: Number knowledge

Students who have difficulty recalling skip-counting patterns and tables may also have trouble when it comes to number patterns.

- Encourage students to refer to number charts, and teach them how to use their knowledge of repeating digits to find the next number in a pattern.
- Help students develop better recall of number facts by playing games and conducting other activities that make practice enjoyable. Group students in a way that ensures everyone will experience success.

Daily practice activity

At the start of the week, ask students what a rule is and why we have rules. Start with a simple number pattern on the board, such as 1, 3, 5, 7, and ask students to suggest what the rule is for the pattern. Repeat this activity each day, with more difficult patterns.

Session 1: Pre-assessment

Students to complete: Assessment book, Pre-test 9, Unit 4, Topic 1, p. 18. (Alternatively, you can download the test from the **Planning & Assessment** section of the Teacher Dashboard.)

Session 2: Topic introduction

Whole class

Digital teaching object

Use the digital teaching object on the Teacher Dashboard to introduce the key mathematical concepts and language.

Introductory activity: Number patterns in real life

In mixed-ability pairs, give students a blank calendar page for the current month, or display one on the interactive whiteboard. Ask students to work with their partner to identify as many different patterns as they can in the numbers on the page, and record the rules for each pattern. Encourage them to be creative in their search, looking for diagonal patterns as well as horizontal and vertical ones. Challenge students to identify the next five numbers in one of their patterns. Share students' discoveries as a class, recording the different types of patterns that were found.

At-standard group

Student book

Students to complete: Guided and Independent Practice activities, pp. 61–63. Ask early finishers to use different colours to explore the multiples of 3, 6 and 9 on one of the hundred charts on p. 63.

Support group

Concept exploration and skill development: Exploring number patterns

Most students will have some knowledge about number patterns from their experiences with skip counting. This makes counting patterns a good place to start when exploring multiplication patterns. Enlarge a copy of *BLM 18:Exploring number patterns* and use the first circle to demonstrate how to record the number pattern made by counting by twos. What shape does it make? Will it make the same pattern if you start at 1 instead of 0?

Give students their own copy of BLM 18 and *BLM 19: Number pattern record sheet*. Ask students to count on by the numbers listed in the record sheet, representing each one on a circle to see what pattern shape it makes and recording their findings. Discuss the results, asking students to identify the longest and shortest patterns and the rule that would be used to describe each counting pattern.

Student book with teacher support

Students to complete: Guided Practice activities, p. 61, using a hundred chart with counters to mark the numbers in each pattern as needed.

Extension group

Student book

Students to complete: Guided and Independent Practice activities, pp. 61–63.

Activity sheet

Students to begin: *Activity sheet 14: Patterns with numbers*. You can download this from the **Resources** section of the Teacher Dashboard.

Session 3: Instruction and consolidation

Whole class

Topic exploration: Applying multiplication patterns

It’s helpful for students to understand the relevance of patterns in everyday life. Brainstorm different situations when number patterns are used. You may need to make some suggestions to get students started, e.g. how many packs of 12 chocolate frogs might you need if there are 18 people at your party? Or how many nails might you need to construct 10 chairs that each require 40 nails? Set students a “mass production” craft project to give them hands-on experience with

multiplication patterns, e.g. ask students to make a village using craft sticks, with each house identical. Students would need to work out how many craft sticks they'll need for one house, and use this number to identify how many sticks they'll need for two, five or 10 houses. Instruct students to record their patterns, and then allow them to complete the project in small groups. Ensure each group writes a brief summary of the rule for the pattern, and how they used the pattern to work out how many sticks they needed. Display students' work and give them time to view what other groups have done.

At-standard group

Teacher activity: Describing and creating number patterns

Pose the following scenario to students:

Samuel's grandmother gives him eight presents every year for his birthday. He turned nine yesterday. How many birthday presents has he received from his grandmother in his lifetime?

Discuss different ways to solve the problem, such as drawing the solution using repeated addition or multiplication. How could you use this information to find out how many presents Samuel has received at any age?

Ask students to write their own number pattern stories, then swap the stories around the group so students work on each other's problems. Encourage students to describe the strategies they used and how they could apply the rules for the pattern to find the solution for any number.

Student book

Students to complete: Extended Practice activities, p. 64.

Support group

Student book with teacher support

Students to complete: Independent and Extended Practice activities, pp. 62–64. Check-in with students as they work through the Independent Practice activities, discussing any difficulties, before supporting them to complete the Extended Practice, using manipulatives to model the shapes as needed.

Extension group

Student book

Students to complete: Extended Practice activities, p. 64.

Activity sheet

Students to complete: *Activity sheet 14: Patterns with numbers*. You can download this from the **Resources** section of the Teacher Dashboard.

Session 4: Post-assessment

Students to complete: Assessment book, Post-test 9, Unit 4, Topic 1, p. 19. (Alternatively, you can download the test from the **Planning & Assessment** section of the Teacher Dashboard.)

OXFORD
UNIVERSITY PRESS
AUSTRALIA & NEW ZEALAND

oxford maths

Oxford Maths Year 5 Suggested Term Planner

Term 1

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1	1. Number and place value	1. Place value	Read, write, represent and order numbers up to 5 digits and beyond	6–9	2–3
2	5. Using units of measurement	1. Length and perimeter	Accurately measure lengths to the millimetre and convert between common units of length. Use appropriate strategies to calculate perimeter	76–79	26–27
3–4	1. Number and place value	2. Addition mental strategies	Choose and apply appropriate mental addition strategies such as rounding, estimation and the split strategy	10–13	4–5
		3. Addition written strategies	Use strategies such as identifying easy to add numbers within the vertical algorithm for addition	14–17	
5	4. Patterns and algebra	1. Number patterns	Articulate and apply rules to continue and create number and geometric patterns. Use diagrams to represent pattern choices	68–71	22–23
6	6. Shape	1. 2D Shapes	Identify and classify polygons by their properties, including types of triangles	96–99	36–37
7–8	2. Fractions and decimals	1. Comparing and ordering fractions	Read, interpret and order unit fractions with different denominators, and place them on number lines	48–51	16–17
		2. Adding and subtracting fractions	Apply knowledge of equivalent fractions to add and subtract fractions with a common denominator	52–55	
9	5. Using units of measurement	5. Time	Explore 24-hour time and identify the connections and convert between 12-hour, 24-hour and am and pm time	92–95	34–35

oxford maths

Oxford Maths Year 5 Suggested Term Planner

Term 2

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1–2	1. Number and place value	4. Subtraction mental strategies	Choose and apply appropriate subtraction strategies such as rounding, the compensation strategy and counting up	18–21	6–7
		5. Subtraction written strategies	Use the vertical algorithm to solve subtraction problems with larger number and identify and apply strategies to check answers	22–25	
3	5. Using units of measurement	2. Area	Use effective strategies to calculate area using appropriate units	80–83	28–29
4	1. Number and place value	6. Multiplication mental strategies	Explore and choose appropriate mental multiplication such as the tens trick, and doubling and halving	26–29	8–9
5–6	9. Data representation and interpretation	1. Collecting and representing data	Explore the concepts of numerical and categorical data and use this knowledge to collect data and construct appropriate displays	128–131	52–53
		2. Representing and interpreting data	Create a variety of data displays and make accurate inferences based on the data	132–135	54–55
7	1. Number and place value	8. Factors and multiples	Explore the concepts of factors and multiples and identify and problem solve using them	36–39	10–11
8	2. Fractions and decimals	3. Decimal fractions	Represent, interpret and compare decimal fractions to thousandths	56–59	18–19
9	7. Geometric reasoning	1. Angles	Estimate and accurately measure and construct angles using a protractor and identify angle types	104–107	40–41

oxford maths

Oxford Maths Year 5 Suggested Term Planner

Term 3

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1–2	1. Number and place value	7. Multiplication written strategies	Explore and choose appropriate written multiplication strategies such as the area model and contracted multiplication	30–35	8–9
3	8. Location and transformation	1. Transformations	Use the reflection, rotation and translation transformations to continue, describe and create patterns	108–111	42–43
4	2. Fractions and decimals	4. Percentages	Explore percentages as a fraction of 100 and convert fractions, decimals and percentages	60–63	20–21
5–6	8. Location and transformation	4. Grid references 5. Giving directions	Accurately interpret and record positions using grid map coordinates Use compass points and directional language to follow and give instructions	120–123 124–127	48–49 50–51
7	5. Using units of measurement	3. Volume and capacity	Use effective strategies to calculate capacity and volume using formal metric units. Compare and order capacities expressed in different units	84–87	30–31
8	1. Number and place value	9. Divisibility	Explore divisibility tests for numbers to 10 and use them in calculations and problem solving	40–43	12–13
9	6. Shape	2. 3D objects	Identify and classify three-dimensional objects by their properties and recognise their nets	100–103	38–39

oxford maths

Oxford Maths Year 5 Suggested Planner

Term 4

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1	4. Patterns and algebra	2. Number operations and properties	Investigate the effect of changes in the order of operations and use this knowledge to solve problems across the four operations	72–75	24–25
2–3	1. Number and place value	10. Division written strategies	Choose and apply appropriate division strategies such as the split strategy and the formal division algorithm to solve division problems	44–47	14–15
4–5	10. Chance	1. Chance	Explore chance outcomes using fractions, decimals and percentages and make reasonably evaluations of chance events	136–139	56–57
		2. Chance experiments	Predict and analyse the outcomes of chance experiments	140–143	
6	3. Money and financial mathematics	1. Financial plans	Investigate and create simple financial plans including GST	64–67	20–21
7	5. Using units of measurement	4. Mass	Identify and convert between appropriate units of mass and accurately use measurement devices	88–91	32–33
8–9	8. Location and transformation	2. Symmetry	Explore and identify line and rotational symmetry in common 6. Shapes and objects	112–115	44–45
		3. Enlargements	Enlarge and reduce the size of drawings, including using scale factors	116–119	46–47

oxford maths for australian schools

Year 5 Learning sequence

Curriculum links

Australian Curriculum

Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction (ACMNA107)

Victorian Curriculum

Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction (VCMNA192)

Follow a mathematical algorithm involving branching and repetition (iteration) (VCMNA194)

NSW Syllabus

MA3-8NA analyses and creates geometric and number patterns, constructs and completes number sentences, and locates points on the Cartesian plane

Learning focus

Articulate and apply rules to continue and create number and geometric patterns. Use diagrams to represent pattern choices.

Materials

- *BLM 10: What next?*
- *BLM 11: My diagram rules*
- *Activity sheet 16: The big top*

Potential difficulties: Basic computational skills

For students who aren't confident with basic computational skills such as adding and subtracting fractions and decimals, identifying and continuing patterns can be difficult.

- Allow students to use visual aids such as number lines to support their understanding of patterning and to help them more readily identify computational errors.

- Spend time building fluency with counting backwards and forwards through counting games and other activities that develop automatic recall, allowing students to focus more on identifying and applying pattern rules.

Daily practice activity

Each day, write the first four numbers of a number pattern on the board, such as 20, 18.5, 18, 16.5. Continue the pattern verbally and make a deliberate mistake as you go. Ask students to listen out for the error and stand up when they hear it. Choose a student to nominate what the number should've been.

Session 1: Pre-assessment

Students to complete: Assessment book, Pre-test 11, Unit 4, Topic 1, p. 22. (Alternatively, you can download the test from the **Planning & Assessment** section of the Teacher Dashboard.)

Session 2: Topic introduction

Whole class

Digital teaching object

Use the digital teaching object on the Teacher Dashboard to introduce the key mathematical concepts and language.

Introductory activity: Identifying patterns

Some patterns will be very obvious to most students and they will have no trouble identifying the rule, e.g. a simple count by two of 2, 4, 6, 8. However, students need to develop strategies to identify patterns that are less obvious. Write a growing pattern on the board, such as 1, 3, 9, 27. As a class, brainstorm questions that can be asked to work out the rule for the pattern. Some examples include: Are the numbers increasing or decreasing? Are the numbers in the pattern evenly spaced? Use the questions to guide students to find the rule and write the next three numbers in the pattern together.

Write two other patterns on the board with different rules, such as a decreasing counting pattern, e.g. 100, 97.5, 95, 92.5, and a two-step pattern, e.g. 2, 7, 6, 11, 10. In mixed-ability pairs, instruct students to write all the questions they can think of about the patterns to help them identify the rules and then record the next three numbers in each. Once complete, come together and share responses, making a master list of all the questions used. Display the list so students can refer to it as they continue to work on patterns during the topic.

At-standard group

Student book

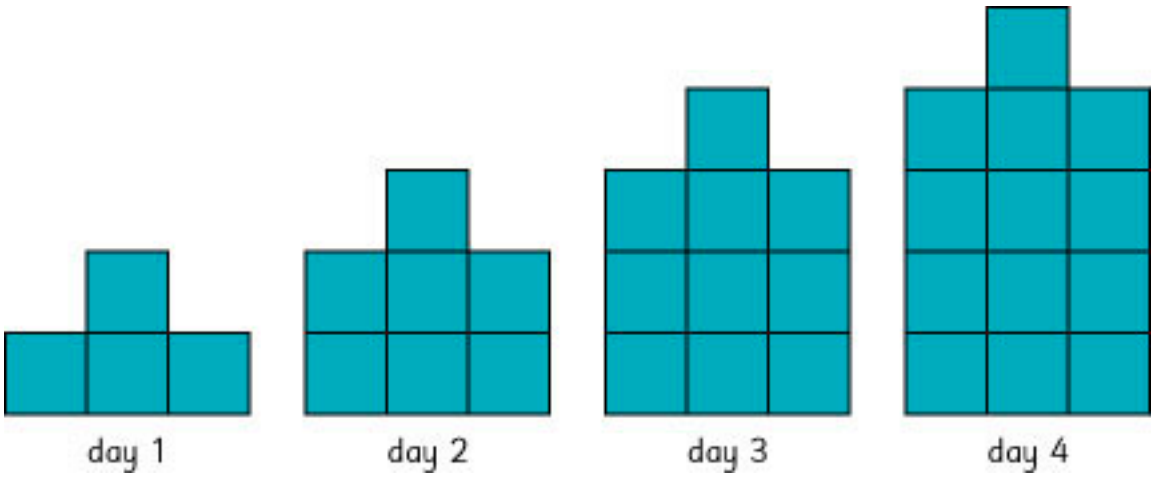
Students to complete: Guided and Independent Practice activities, pp. 68–70. Ask early finishers to make up their own two-step number pattern with a rule and draw a diagram to show how the rule can be followed.

Support group

Concept exploration and skill development: Visual patterning

Visual patterns are a good tool to support students to build a deeper understanding of number patterns. Draw the growing pattern below on the whiteboard and pose the following scenario:

This is a picture of a building under construction. It's getting bigger each day. Draw what you think the building will look like on day 5.



Share students' responses and discuss their thinking. Challenge students to suggest how they might represent this pattern in numbers. What would the rule be? Using this rule, ask students to try and work out what building will look like on day 10, without having to make the ones in between. Repeat with other simple growing shape patterns to give students practice identifying how the rules and numbers of a pattern relate to each other.

Student book with teacher support

Students to complete: Guided Practice activities, p. 68, using visual aids such as number charts and number lines as required.

Extension group

Student book

Students to complete: Guided and Independent Practice activities, pp. 68–70.

Activity sheet

Students to begin: *Activity sheet 16: The big top*. You can download this from the **Resources** section of the Teacher Dashboard.

Session 3: Instruction and consolidation

Whole class

Topic exploration: Exploring patterns and rules

Write the first two numbers of a pattern on the whiteboard, such as 3, 5. Ask students for suggestions of what the next two numbers in the pattern might be, encouraging them to think of multiple possibilities, such as counting by two (3, 5, 7, 9), adding one more each time (3, 5, 8, 12) or adding two then subtracting one (3, 5, 4, 6).

In mixed-ability pairs, give students *BLM 10: What next?* Ask them to suggest a possible rule for each of the patterns and then continue the patterns. Share students' responses and discuss how they chose and applied their rules.

At-standard group

Teacher activity: Rule diagrams

Show students *BLM 11: My diagram rules* and invite one student to choose a starting number between 1 and 100. Work through the algorithm as a group, recording each of the steps on the whiteboard as you go. How many steps did it take? Individually, ask students to choose a different start number and record the steps it takes to get to 1 using the diagram. Depending on the students' mental computational skills, they might like to choose a number up to 1000. As a group, discuss which numbers took the most steps and why.

In pairs, challenge students to create their own simple pattern diagrams. Talk about the different shaped boxes and what they're used for, referring to BLM 11 and p. 69 of the student books, and brainstorm the options that might be appropriate for a similar diagram. Allow students to swap their diagrams with their partner to try, or to share them with the class.

Student book

Students to complete: Extended Practice activities, p. 71.

Support group

Student book with teacher support

Students to complete: Independent and Extended Practice activities, pp. 69–71. Check-in with students as they work through the Independent Practice activities, discussing any difficulties, before supporting them to complete the Extended

Practice, modelling the patterns with concrete materials or on an interactive whiteboard as required.

Extension group

Student book

Students to complete: Extended Practice activities, p. 71.

Activity sheet

Students to complete: *Activity sheet 16: The big top*. You can download this from the **Resources** section of the Teacher Dashboard.

Session 4: Post-assessment

Students to complete: Assessment book, Post-test 11, Unit 4, Topic 1, p. 23. (Alternatively, you can download the test from the **Planning & Assessment** section of the Teacher Dashboard.)

oxford maths

Oxford Maths Year 6 Suggested Term Planner

Term 1

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1	1. Number and place value	1. Place value	Read, write, represent and order numbers up to 6 digits and beyond	6–9	2–3
2	5. Using units of measurement	1. Length	Estimate, measure and compare lengths and perimeters using formal metric units. Convert between and solve problems using common units of length	86–89	32–33
3	1. Number and place value	4. Mental strategies for addition and subtraction	Choose and apply appropriate mental addition and subtraction strategies such as rounding, estimation and the split strategy	18–21	6–7 8–9
4	4. Patterns and algebra	1. Geometric and number patterns	Identify and apply rules to continue and create number and geometric patterns. Explore flow charts as patterning algorithms	78–81	28–29
5–6	9. Data representation and interpretation	1. Collecting, representing and interpreting data	Gather data and construct and interpret appropriate displays including line, picture and column graphs with two categorical variables	126–129	52–53
7–8	2. Fractions and decimals	1. Fractions	Write, represent and compare fractions of wholes and collections and find equivalent fractions	46–49	18–19
		2. Adding and subtracting fractions	Apply knowledge of equivalent fractions to add and subtract fractions with the same or related denominators	50–53	18–19
9	5. Using units of measurement	5. Timetables and timelines	Explore, interpret and solve problems involving time lines and timetables	102–105	40–41

oxford maths

Oxford Maths Year 6 Suggested Term Planner

Term 2

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1–2	1. Number and place value	5. Written strategies for addition	Consolidate understanding of the vertical addition algorithm to accurately solve addition problems with large numbers	22–25	6–7
		6. Written strategies for subtraction	Consolidate understanding of the vertical subtraction algorithm with trading across multiple columns to accurately solve addition problems with large numbers	26–29	8–9
3	6. Shape	1. 2D shapes	Identify and classify regular and irregular shapes including types of triangles and parts of circles	106–109	42–43
4	1. Number and place value	7. Mental strategies for multiplication and division	Explore and choose appropriate mental multiplication and division strategies such as using multiples of 10, and doubling and halving	30–33	10–11
5	5. Using units of measurement	2. Area	Calculate and solve problems involving area using common metric units	90–93	34–35
6	1. Number and place value	2. Square numbers and triangular numbers	Explore and describe the properties of square and triangular numbers	10–13	4–5
7	1. Number and place value	8. Written strategies for multiplication	Explore and choose appropriate written multiplication strategies such as extended and contracted multiplication to solve problems with larger numbers	34–37	12–13
8	2. Fractions and decimals	3. Decimal fractions	Read, write, compare and order decimals to thousandths	54–57	20–21
9	7. Geometric reasoning	1. Angles	Accurately measure and identify common angles and calculate unknown angles	114–117	46–47

oxford maths

Oxford Maths Year 6 Suggested Term Planner

Term 3

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1	1. Number and place value	9. Written strategies for division	Explore and choose appropriate written division strategies such as short division to solve problems with larger numbers and remainders	38–41	14–15
2	8. Location and transformation	1. Transformations	Investigate, describe, continue and create patterns based on transformations of two-dimensional shapes, including tessellations	118–121	48–49
3	2. Fractions and decimals	4. Addition and subtraction of decimals	Apply knowledge of vertical algorithms to add and subtract decimals	58–61	22–23
4	1. Number and place value	3. Prime and composite numbers	Explore and describe the properties of prime and composite numbers	14–17	4–5
5–6	2. Fractions and decimals	7. Percentage, fractions and decimals	Read, write and interpret and compare percentages, fractions and decimals, and convert from one to another	70–73	26–27
7	5. Using units of measurement	4. Mass	Convert between and solve problems using common units of mass	98–101	38–39
8–9	10. Chance	1. Describing probabilities 2. Conducting chance experiments and analysing outcomes	Evaluate probabilities of common events as fractions, decimals and percentages Conduct and analyse the results of chance experiments	134–137 138–141	56–57

oxford maths

Oxford Maths Year 6 Suggested Term Planner

Term 4

Weeks	Unit	Topic	Focus	Student book pages	Assessment book pages
1	4. Patterns and algebra	2. Order of operations	Investigate and apply the order of operations rules to solve more complex number problems	82–85	30–31
2 - 3	2. Fractions and decimals	5. Multiplication and division of decimals	Use contracted multiplication and short division to accurately calculate with decimal numbers to two places	62–65	22–23
		6. Decimals and power of 10	Explore the effect of multiplying and dividing decimal and whole numbers by powers of 10	66–69	24–25
4	5. Using units of measurement	3. Volume and capacity	Measure, calculate and compare volume and capacity using formal metric units. Convert between common units of capacity	94–97	36–37
5	1. Number and place value	10. Integers	Explore negative numbers on number lines and in real life situations to solve related problems	42–45	16–17
6	9. Data representation and interpretation	2. Data in the media	Interpret and critically analyse secondary data	130–133	54–55
7	3. Money and financial mathematics	1. Financial mathematics	Apply knowledge of percentages to calculate and compare discounts on prices	74–77	26–27
8	6. Shape	2. 3D objects	Identify and draw three-dimensional objects using knowledge of properties	110–113	44–45
9	8. Location and transformation	2. The Cartesian coordinate system	Explore the four quadrants of the Cartesian coordinate system and locate and describe points on the grid	122–1125	50–51

oxford maths for australian schools

Year 6 Learning sequence

Curriculum links

Australian Curriculum

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

Victorian Curriculum

Continue and create sequences involving whole numbers, fractions and decimals. Describe the rule used to create the sequence (VCMNA219)

Design algorithms involving branching and iteration to solve specific classes of mathematical problems (VCMNA221)

NSW Syllabus

MA3-8NA analyses and creates geometric and number patterns, constructs and completes number sentences, and locates points on the Cartesian plane

Learning focus

Identify and apply rules to continue and create number and geometric patterns. Explore flow charts as patterning algorithms.

Materials

- counters
- calculators
- *Activity sheet 20: Fibonacci fun*

Activity sheet materials

- grid paper

Potential difficulties: Identifying patterns

If students don’t correctly identify the basis of a pattern, it will affect their ability to accurately continue the pattern.

- Encourage students to hypothesise about the rule for a pattern and then test their hypothesis. Is the rule a reliable predictor of the numbers in the pattern?
- Allow students plenty of time to create rules and complete a pattern, and to make a pattern for which they create a rule to consolidate the interdependent role between the two elements.

Daily practice activity

Each day, write a simple flow chart algorithm for a regular class activity, such as lining up for sport or cleaning up the classroom.

Session 1: Pre-assessment

Students to complete: Assessment book, Pre-test 14, Unit 4, Topic 1, p. 28. (Alternatively, you can download the test from the **Planning & Assessment** section of the Teacher Dashboard.)

Session 2: Topic introduction

Whole class

Digital teaching object

Use the digital teaching object on the Teacher Dashboard to introduce the key mathematical concept.

Introductory activity: What's the rule?

Think of a simple rule, such as "add 0.5", but don't tell the students. Invite one student to nominate a number, and then tell the class what the result is once you have applied your rule. For example, if the student says "6"', then your response would be "6.5". Ask students to suggest what your rule might be. Could there be other alternatives? Invite a second student to give you a number so you can apply your rule again. Let them know the outcome. Does this confirm the students' initial suggestion?

In mixed-ability pairs, ask students to complete the same activity, with one student thinking of a rule that the other student has to guess, and then swapping the roles. Allow time for students to share some of the rules that they used and how they worked out what the rule was.

At-standard group

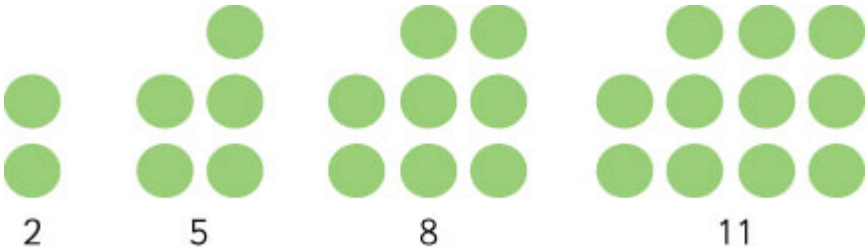
Student book

Students to complete: Guided and Independent Practice activities, pp. 78–80. Ask early finishers to make and describe their own geometric patterns.

Support group

Concept exploration and skill development: Representing patterns

Representing patterns in multiple ways can help consolidate the concept for students who need extra support; growing patterns are particularly good for this. Start with a simple pattern such as 2, 5, 8, 11. Write the sequence on the board and ask students if they can see the rule. Model the pattern using counters, ensuring that the pattern is evident, as in the following example.



Can students see the rule? How else could the pattern be represented? (For example, on a number line.) Repeat with other patterns including fractions, geometric patterns, whole numbers and decimals, challenging students to represent the patterns in different ways and to articulate the rules.

Student book with teacher support

Students to complete: Guided Practice activities, p.78. Support students to build their understanding by using concrete materials or number lines to represent the patterns.

Extension group

Student book

Students to complete: Guided and Independent Practice activities, pp. 78–80.

Activity sheet

Students to begin: *Activity sheet 20: Fibonacci fun*. You can download this from the **Resources** section of the Teacher Dashboard.

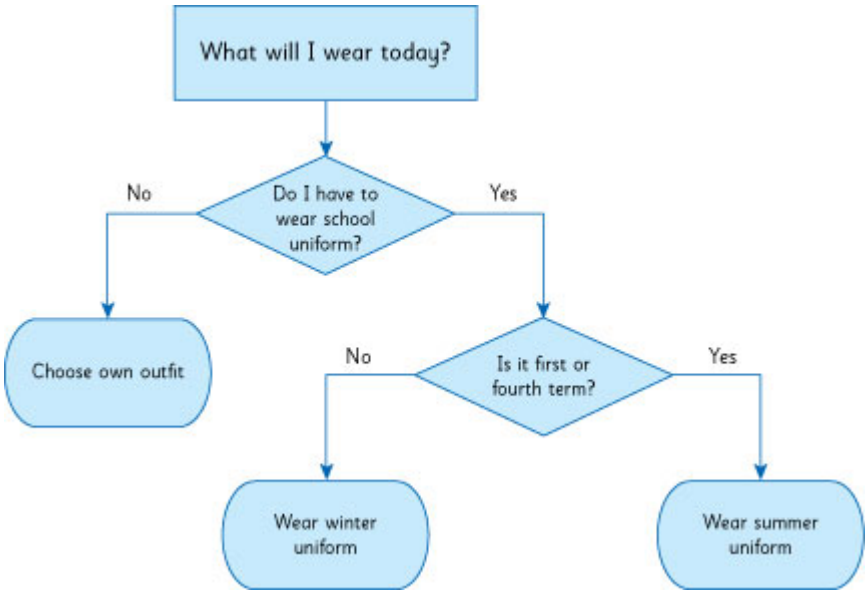
Session 3: Instruction and consolidation

Whole class

Topic exploration: Digital flowcharts

Many computer programs such as PowerPoint are good tools for representing simple branch algorithms. Reproduce the algorithm below in PowerPoint using

the **Flowchart** tools in the **Shapes** menu. Talk through each step and choice with students as you construct the flowchart.



Brainstorm with students other real-life scenarios that lend themselves to branch algorithms. In pairs, ask students to create a branch algorithm of their choice in PowerPoint. Collate each slide into a class algorithm resource and take time to share and discuss each one.

At-standard group

Teacher activity: Number machines

Students have probably seen number or output machines before, but they may not have considered that calculators are a form of number machine; in fact, early calculators were often called adding machines! Give each student a calculator and give them the following scenario:

You entered the number *5* into your calculator, pressed two buttons, then *equals* and ended up with the number *10*.

What might the buttons be? Allow students time to experiment with their calculators to find the “rule” that would result in an output of 10 with an input of 5. Discuss the fact that there are two possibilities – + *5* or ×× *2* – and ask students how they could work out which buttons you pressed.

In pairs, ask students to perform the same activity, with one student telling the other the input, output and number of keys pressed and the other hypothesising about the rule, then testing their theory. Introduce students to how they could use a simple formula to represent their rule. For example, if the number machine is multiplying the input by 2, the rule could be written as $n \times 2 = a$, where n is the input number and a is the answer. Give students the opportunity to write and test their own rules written in this way.

Student book

Students to complete: Extended Practice activities, p. 81.

Support group

Student book with teacher support

Students to complete: Independent and Extended Practice activities, pp. 79–81. Check-in with students as they work through the Independent Practice activities, discussing any difficulties, before supporting them to complete the Extended Practice, modelling the problems with concrete materials as required.

Extension group

Student book

Students to complete: Extended Practice activities, p. 81.

Activity sheet

Students to complete: *Activity sheet 20: Fibonacci fun*. You can download this from the **Resources** section of the Teacher Dashboard.

Session 4: Post-assessment

Students to complete: Assessment book, Post-test 14, Unit 4, Topic 1, p. 29. (Alternatively, you can download the tests from the **Planning & Assessment** section of the Teacher Dashboard.)

Do you need to contact

Oxford University Press?

Customer Service

Email: cs.au@oup.com
Phone: 1300 650 616
Fax: 1300 813 602

Digital Support

Email: digitalsupport.au@oup.com
Phone: 1300 650 616

Mailing Address

GPO Box 2784
Melbourne Victoria 3001

Operating Hours

8:30am – 4:45pm
Monday to Friday AEST
(Excluding public holidays)

We look forward to hearing from you.

OXFORD
UNIVERSITY PRESS
AUSTRALIA & NEW ZEALAND