

# OXFORD MATHS ASSESS

YEAR  
**6**

ASSESSMENT  
OF AND FOR  
LEARNING



BRIAN MURRAY

OXFORD



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# ASSESSMENT OF AND FOR LEARNING: INTRODUCTION

## WHAT IS OXFORD MATHS ASSESS?

*Oxford Maths Assess* is a total maths assessment solution that provides both assessment *of* learning and assessment *for* learning.

Linked explicitly to the Australian Curriculum and NSW Syllabus for the Australian Curriculum, *Oxford Maths Assess* blends seamlessly with any maths teaching resource or approach.

*Oxford Maths Assess*:

- is easy for students, parents and teachers to follow
- provides primary educators with assessment content that not only shows basic understanding and fluency of a topic, but also provides students with content that enables them to:
  - think about their understanding of a topic
  - extend themselves by applying the concepts further or by comparing different ways of working
  - explain the way they have solved a problem or why a method does/doesn't work
- provides evidence of a student's level of achievement in every content strand of mathematics (assessment of learning), but also provides teachers with verification of a student's proficiency level in the key areas of understanding, fluency, problem solving, reasoning and communicating (assessment for learning)
- includes a CD-ROM for printing test pages (or they can be photocopied directly from the book)
- includes a grading guide and suggestions for students who are achieving beyond or below the expected level of achievement.

## PART 1: ASSESSMENT OF LEARNING

The assessment of learning component is principally a tool to help the teacher (and perhaps also the student) measure progress towards achievement standards.

The aim is to answer questions such as:

- Where was the student?
- Where is the student now?
- Where does the student go next?

The focus of the Part 1 tests is on finding out what a student has learned. This makes it a comparatively easy tool to use when reporting on a student's progress.

Each assessment of learning topic attracts a total of 20 marks. The four pairs of questions become increasingly complex, with each question being worth between one and four marks. (See suggested grading guide on page 6.)

Multiple choice questions

Questions requiring a written response

Unit number

**1A Place value (Part 1)**

NAME \_\_\_\_\_ DATE \_\_\_\_\_

<p><b>1 Shade one bubble</b></p> <p>What is the largest number in this set of numbers?</p> <p><input type="radio"/> 73 462      <input type="radio"/> 73 426</p> <p><input type="radio"/> 73 624      <input type="radio"/> 73 642</p>	<p><b>2 Shade one bubble</b></p> <p>What is the smallest number that can be made using each of these digits once?</p> <p>3, 7, 5, 8, 2, 9</p> <p><input type="radio"/> 325 789      <input type="radio"/> 352 789</p> <p><input type="radio"/> 235 789      <input type="radio"/> 235 798</p>
<p><b>3 Shade one bubble</b></p> <p>What is the largest number that can be made from these digits if the 9 is in the ten thousands place?</p> <p>3, 7, 5, 8, 2, 9</p> <p><input type="radio"/> 897 532      <input type="radio"/> 987 532</p> <p><input type="radio"/> 789 532      <input type="radio"/> 798 532</p>	<p><b>4 Write on the lines</b></p> <p>Write 14 204 079 in words.</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p><b>5 Shade one bubble</b></p> <p>Rounded to the nearest hundred thousand, 1 449 999 becomes:</p> <p><input type="radio"/> 1 500 000      <input type="radio"/> 1 440 000</p> <p><input type="radio"/> 1 400 000      <input type="radio"/> 1 450 000</p>	<p><b>6 Shade one bubble</b></p> <p><math>3\ 000\ 000 + 40\ 000 + 7\ 000 + 500 + 70</math> is the same as:</p> <p><input type="radio"/> 3 400 757      <input type="radio"/> 3 040 757</p> <p><input type="radio"/> 3 407 570      <input type="radio"/> 3 047 570</p>
<p><b>7 Write on the lines</b></p> <p>Write <b>in words</b> the number that is <b>one hundred thousand</b> more than 452 983 000.</p> <p>_____</p> <p>_____</p>	<p><b>8 Write on the lines</b></p> <p>Write <b>in words</b> the number that is <b>one hundred</b> less than 1 000 078.</p> <p>_____</p> <p>_____</p>

10

## PART 2: ASSESSMENT FOR LEARNING

The focus of the assessment for learning component is the students' level of development in the proficiency strands of the mathematics curriculum, such as the ability to reflect, reason, explain, explore and adapt the concepts from the content strands.

Assessment for learning differs from assessment of learning because its principal focus is inquiry into the learning process. Teachers look at the way students learn, rather than at their level of achievement in a particular area. This can be used to inform the planning of future learning activities or tasks.

Each assessment for learning topic attracts a total of 20 marks. A total of five marks can be applied to each of the four questions. (See suggested grading guide on page 6.)

The Part 2 assessments do not always have enough answer space for lengthy responses. Teachers can elicit answers of greater depth by encouraging students to work off the page, using a workbook or a piece of paper. This will result in a more meaningful expression of a student's ability to work mathematically.

## SELF-ASSESSMENT

*Oxford Maths Assess* can also be used by students for self-assessment. This procedure could be as simple as the students rating their own level of achievement as outstanding, high, sound, basic or limited. It could also form part of a maths interview or a learning journal, with the student responding to questions such as: *What did I find easy/hard in this topic? What do I need more help with? What would I like to learn more about/learn next?*

## THE MATHS INTERVIEW

When evaluating a student's level of development, the test answers do not tell the whole story. Consequently, care should be taken to observe students' working and feedback should be provided where appropriate.

To build a fair and accurate picture of a student's ability to work mathematically, teachers are encouraged to conduct a short maths interview, perhaps once a term. During the interview, the student can be given the opportunity to talk through – and perhaps expand on – their responses. Any of the assessments could form the basis of this interview.

It can be helpful to begin with a question that the student feels they answered well. Alternatively, discuss a question that the teacher feels a student may have failed to answer appropriately, due to a problem with written communication skills.

The interview only needs to be a few minutes long and can be similar in style to the reading interviews that many teachers hold during the year. Students' oral responses, together with their written responses to the assessments, will provide teachers with the evidence and confidence to assign an objective grade in the proficiency (working mathematically) strands, as well as a basis for meaningful teacher-student and student-teacher feedback.

Unit number

**1A Place value (Part 2)**

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_

**1** Circle the numbers that are larger than fifteen million but less than one hundred million.

40 350 045      5 045 305      115 350 045      51 054 350

15 045 305      14 045 350      95 540 053      150 045 305

**b** By how many is 10 000 000 less than one hundred million?

**2**

**a** You know that 1 742 385 is bigger than 1 724 385 because:

The millions digit is worth more in the first number.       The hundreds of thousands digit is worth more in the first number.

The tens of thousands digit is worth more in the first number.       The thousands digit is worth more in the first number.

**b** By how many is the second number smaller than the first number?

**3** According to the Australian Bureau of Statistics, the population of Brisbane was 2 100 000 in 2011 (to the nearest hundred thousand). The actual number can be made using each of the following digits once:

1      2      4      5      6      7      7

Make a list of the numbers that could represent the actual population of Brisbane in 2011. (There are more than ten possibilities.)

**4** In 1959 the population of Australia reached 10 million for the first time. In the year before that, the population was just under 10 million, but it was rounded up to 10 million. The digits that make up the exact population in 1958 are:

2      4      4      5      6      7      9

Use the following clues to help you work out the population:

- There were 6 ones and 5 tens of thousands.
- The same digit was in the tens and the thousands column.

Five marks can be assigned to each of the four questions and a total out of 20 applied.

Extended format questions

Students can be encouraged to record their working out and answers in a workbook or on a piece of paper.

## GRADING GUIDE

### MARKING AND GRADING PART 1 TESTS

Each pair of questions in the Part 1 tests becomes progressively more difficult and acquires a larger proportion of the total marks.

- Questions 1 and 2 = 1 mark each
- Questions 3 and 4 = 2 marks each
- Questions 5 and 6 = 3 marks each
- Questions 7 and 8 = 4 marks each

Total = 20 marks

### MARKING AND GRADING PART 2 TESTS

Each question in the Part 2 tests is worth a total of five marks. A grade can be assigned to each topic. However, an inquiry into the way a student learns does not rely on competence in any specific maths topic, but rather on a student's approach in general. Therefore, a review of a range of Part 2 assessments would provide a more stable platform on which to base a grade in the proficiency (working mathematically) strands.

### SUGGESTED METHOD FOR ASSIGNING A GRADE

Raw Score	% Score	Grade	Note
20	100%	<b>A</b> – Well above the achievement standard	The student's achievement level is outstanding and they are achieving well above the expected achievement standard in this area of mathematics. The student could be expected to build on their understanding and transfer their knowledge to unfamiliar situations. They might also be expected to understand and work comfortably with concepts from a higher achievement standard.
16–19	80% – 95%	<b>B</b> – Above the achievement standard	The student's achievement level is high and they are working very confidently in this area of mathematics. The student could be expected to develop their level of understanding and explore the concept further. They are achieving above the expected achievement standard for this age group and could be expected to understand some concepts from a higher achievement standard.
10–15	50% – 75%	<b>C</b> – At the achievement standard	The student has a sound understanding of the knowledge and concepts in this area of mathematics. They are achieving at the expected achievement standard for this age group.
5–9	25% – 45%	<b>D</b> – Below the achievement standard	The student has a partial understanding of the required knowledge and concepts in this area of mathematics. They are achieving at a level that is somewhat below the anticipated achievement standard for the age group. Further reinforcement of the learning activities is required in order for the student to accomplish this achievement standard and the teacher may wish to review the teaching and learning process in order to assist the student. Consolidation of the knowledge and concepts from the previous achievement standard might be considered.
< 5	lower than 25%	<b>E</b> – Well below the achievement standard	The student has a minimal understanding of the required knowledge and concepts in this area of mathematics. They are achieving at a level that is well below the anticipated achievement standard for the age group. Consolidation and practice with the content from a lower achievement standard are recommended before the student attempts further learning activities at the current achievement standard. Additional support and, potentially, a review of the teaching methods would be advantageous.

### FROM ASSESSMENT TO INSTRUCTION


*Oxford Maths Assess* is consistently structured in order to provide teachers with an easily administered, yet comprehensive, assessment tool. Teachers can use the simple grading guide above for the reporting process.

Teachers are also supported by the *From assessment to instruction: Teacher support* section (see pages 74 to 79), which suggests activities for students who are working below or above the expected achievement standard.

Teachers of struggling students should revisit the topic focus from a different perspective, and consider including activities suited to a lower achievement standard. Teachers of capable students should encourage them to gain a deeper level of understanding before extending them with activities suited to a higher achievement standard.

# CURRICULUM OVERVIEW

YEAR 6							
Strand	Theme	Unit	Topic	Assessment Focus	Australian Curriculum (AC)	NSW Syllabus	
Number and Algebra	Understanding our number system	1A	Place value	Explore Base 10 system with numbers of any size	Recognise, represent and order numbers to at least tens of thousands (Extension of: Year 4 ACMNA072)	MA3-4NA Orders, reads and represents integers of any size and describes properties of whole numbers	
		1B	Number properties	Explore prime and composite numbers, triangular and square numbers and factor trees	Identify and describe properties of prime, composite, square and triangular numbers (ACMNA122)		
		1C	Mental strategies for addition and subtraction	Explore mental strategies for addition and subtraction including jump, split and compensation strategies	Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers (ACMNA123)	MA3-5NA Selects and applies appropriate strategies for addition and subtraction with counting numbers of any size	
		1D	Written strategies for addition and subtraction	Work with horizontal and vertical algorithms. Expand and round numbers. Estimate and check answers.			
		1E	Mental strategies for multiplication and division	Explore mental strategies for multiplication and division including multiples and powers of 10, halving, doubling, rounding and estimating	Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers (ACMNA123)	MA3-6NA Selects and applies appropriate strategies for multiplication and division, and applies the order of operations to calculations involving more than one operation	
		1F	Written strategies for multiplication and division	Explore methods of multiplying and dividing whole numbers			
			1G	Integers	Explore positive and negative numbers on a number line and in real-life situations	Investigate everyday situations that use integers. Locate and represent these numbers on a number line (ACMNA124)	MA3-4NA Orders, reads and represents integers of any size and describes properties of whole numbers
		Fractions	2A	Fractions	Compare and order fractions. Find a fraction of a whole. Explore equivalent fractions, improper fractions and mixed numerals.	Compare fractions with related denominators and locate and represent them on a number line (ACMNA125) Find a simple fraction of a quantity where the result is a whole number, with and without digital technologies (ACMNA127)	MA3-7NA Compares, orders and calculates with fractions, decimals and percentages
	2B		Addition and subtraction of common fractions	Add and subtract unlike fractions using a fraction wall and by finding a common denominator	Solve problems involving addition and subtraction of fractions with the same or related denominators (ACMNA126)	MA3-7NA Compares, orders and calculates with fractions, decimals and percentages	
			2C	Decimal fractions	Compare fractions and decimals (to thousandths). Order and compare decimals.	Recognise that the place value system can be extended beyond hundredths (Extension of: Year 5 ACMNA104) Compare, order and represent decimals (Extension of: Year 5 ACMNA105)	MA3-7NA Compares, orders and calculates with fractions, decimals and percentages
		Decimals	2D	Addition and subtraction of decimals	Explore various strategies and methods for addition and subtraction of decimals	Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers (ACMNA128)	
	2E		Multiplication and division of decimals	Explore various strategies and methods for multiplication and division of decimals	Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies (ACMNA129)		
	2F		Decimals and powers of ten	Explore various strategies for multiplication and division of decimals by powers of 10	Multiply and divide decimals by powers of 10 (ACMNA130)		

YEAR 6					Australian Curriculum 	NSW Syllabus
Strand	Theme	Unit	Topic	Assessment Focus		
Number and Algebra	Percentages	2G	Percentage, fractions and decimals	Compare fractions, decimals and percentages	Make connections between equivalent fractions, decimals and percentages (ACMNA131)	MA3-7NA Compares, orders and calculates with fractions, decimals and percentages
		2H	Money and financial mathematics	Work with mathematics in real-world situations using percentages and calculators	Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies (ACMNA132)	MA3-7NA Compares, orders and calculates with fractions, decimals and percentages. MA3-5NA Selects and applies appropriate strategies for addition and subtraction with counting numbers of any size
	Patterns and algebra	3A	Geometric patterns	Explore tables of values. Investigate, describe and write rules for building geometric patterns.	Continue and create sequences involving whole numbers, fractions and decimals. Describe the rule used to create the sequence (ACMNA133)	MA3-8NA Analyses and creates geometric and number patterns, constructs and completes number sentences, and locates points on the Cartesian plane
		3B	Number patterns	Describe and predict the way number patterns build. Find and write rules for number patterns.		
	3C	Order of operations and equations	Define an equation. Explore commutative and distributive laws. Use inverse operations and explore multiple operations (BODMAS).	Explore the use of brackets and order of operations to write number sentences (ACMNA134)	MA3-6NA Selects and applies appropriate strategies for multiplication and division, and applies the order of operations to calculations involving more than one operation	
Measurement and Geometry	Length and area	4A	Length	Investigate and convert between units of length and compare these to the decimal system	Connect decimal representations to the metric system (ACMMG135) Convert between common metric units of length, mass and capacity (ACMMG136) Solve problems involving the comparison of lengths and areas using appropriate units (ACMMG137)	MA3-9MG Selects and uses the appropriate unit and device to measure lengths and distances, calculates perimeters, and converts between units of length
		4B	Area	Define area and surface area. Explore strategies and shortcuts to find area of rectangles and composite shapes.	Connect decimal representations to the metric system (ACMMG135) Solve problems involving the comparison of lengths and areas using appropriate units (ACMMG137)	MA3-10MG Selects and uses the appropriate unit to calculate areas, including areas of squares, rectangles and triangles
	Volume and capacity	4C	Volume and capacity	Compare and contrast volume and capacity. Explore and use appropriate units to measure volume and capacity. Investigate shortcuts to find volume of rectangular prisms.	Connect decimal representations to the metric system (ACMMG135) Connect volume and capacity and their units of measurement (ACMMG138)	MA3-11MG Selects and uses the appropriate unit to estimate, measure and calculate volumes and capacities, and converts between units of capacity
		4D	Mass	Investigate and convert between units of mass and compare these to the decimal system. Explore use of appropriate weighing devices.	Connect decimal representations to the metric system (ACMMG135) Convert between common metric units of length, mass and capacity (ACMMG136)	MA3-12MG Selects and uses the appropriate unit and device to measure the masses of objects, and converts between units of mass
	Time	4E	Timetables	Explore use of various timetables in the real world. Calculate elapsed time.	Interpret and use timetables (ACMMG139)	MA3-13MG Uses 24-hour time and am and pm notation in real-life situations, and constructs timelines
Angles	5A	Angles	Label and name types of angles. Measure and draw angles to one degree. Explore angles of polygons.	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)	MA3-16MG Measures and constructs angles, and applies angle relationships to find unknown angles	

**YEAR 6**

Strand		Assessment Focus			Australian Curriculum	NSW Syllabus
Theme	Unit	Topic			AC	
2D Shapes and 3D Objects	5B	2D shapes and 3D objects	Define 2D shapes and 3D objects. Explore their features and properties. Classify 3D objects. Compare and contrast prisms and pyramids. Identify and draw the nets of 3D objects.		Construct simple prisms and pyramids (ACMMG140)	MA3-15MG Manipulates, classifies and draws two-dimensional shapes, including equilateral, isosceles and scalene triangles, and describes their properties. MA3-14MG Identifies three-dimensional objects, including prisms and pyramids, on the basis of their properties, and visualises, sketches and constructs them given drawings of different views
	6A	Transformations	Explore transformation of shapes through translation, rotation and reflection. Investigate tessellation patterns in the real world.		Investigate combinations of translations, reflections and rotations, with and without the use of digital technologies (ACMMG142)	MA3-15MG Manipulates, classifies and draws two-dimensional shapes, including equilateral, isosceles and scalene triangles, and describes their properties
	6B	Cartesian coordinate system	Explore the four quadrants of the Cartesian plane. Name and plot points in relation to the origin point using positive and negative numbers.		Introduce the Cartesian coordinate system using all four quadrants (ACMMG143)	MA3-8NA Analyses and creates geometric and number patterns, constructs and completes number sentences, and locates points on the Cartesian plane
Statistics and Probability	7A	Representing data	Identify types of graphs. Choose appropriate graph type.		Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables (ACMSP147)	MA3-16SP Uses appropriate methods to collect data and constructs, interprets and evaluates data displays, including dot plots, line graphs and two-way tables
	7B	Interpreting data	Interpret displayed data. Understand and write statements of finding.			
	7C	Data in the media	Interpret data in the real world. Identify correctly represented or misleading data. Identify primary and secondary data.		Interpret secondary data presented in digital media and elsewhere (ACMSP148)	
	7D	Probability	Identify all possible outcomes in a chance situation. Read and assign numerical values to express probability (as fractions, decimals or percentages).		Describe probabilities using fractions, decimals and percentages (ACMSP144)	MA3-16SP Conducts chance experiments and assigns probabilities as values between 0 and 1 to describe their outcomes
		Chance experiments and simulations	Investigate and prepare probability experiments. Understand and make random number generating devices. Determine fairness of experiments.		Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies (ACMSP145) Compare observed frequencies across experiments with expected frequencies (ACMSP146)	

NAME:

DATE:

### 1 Shade one bubble

What is the largest number in this set of numbers?

73 462       73 426

73 624       73 642

### 2 Shade one bubble

What is the smallest number that can be made using each of these digits once?

3, 7, 5, 8, 2, 9

325 789       352 789

235 789       235 798

### 3 Shade one bubble

What is the largest number that can be made from these digits if the 9 is in the ten thousands place?

3, 7, 5, 8, 2, 9

897 532       987 532

789 532       798 532

### 4 Write on the lines

Write 14 204 079 in words.

---



---



---

### 5 Shade one bubble

Rounded to the nearest hundred thousand, 1 449 999 becomes:

1 500 000       1 440 000

1 400 000       1 450 000

### 6 Shade one bubble

3 000 000 + 40 000 + 7000 + 500 + 70 is the same as:

3 400 757       3 040 757

3 407 570       3 047 570

### 7 Write on the lines

Write **in words** the number that is **one hundred thousand** more than 452 983 000.

---



---



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### 8 Write on the lines

Write **in words** the number that is **one hundred** less than 1 000 078.

---



---



---

NAME:

DATE:

1

a Circle the numbers that are larger than fifteen million but less than one hundred million.

40 350 045

5 045 305

115 350 045

51 054 350

15 045 305

14 045 350

95 540 053

150 045 305

b By how many is 10 000 000 less than one hundred million?

2

a You know that 1 742 385 is bigger than 1 724 385 because:

The millions digit is worth more in the first number.

The hundreds of thousands digit is worth more in the first number.

The tens of thousands digit is worth more in the first number.

The thousands digit is worth more in the first number.

b By how many is the second number smaller than the first number?

3

According to the Australian Bureau of Statistics, the population of Brisbane was 2 100 000 in 2011 (to the nearest hundred thousand). The actual number can be made using each of the following digits once:

1

2

4

5

6

7

7

Make a list of the numbers that could represent the actual population of Brisbane in 2011. (There are more than ten possibilities.)

4

In 1959 the population of Australia reached 10 million for the first time. In the year before that, the population was just under 10 million, but it was rounded up to 10 million. The digits that make up the exact population in 1958 are:

2

4

4

5

6

7

9

Use the following clues to help you work out the population:

- There were 6 ones and 5 tens of thousands.
- The same digit was in the tens and the thousands column.

NAME:

DATE:

**1 Shade one bubble**

Which of these is a prime number?

- 13                       15  
 21                       25

**2 Shade one bubble**

Which of these is a composite number?

- 23                       25  
 29                       31

**3 Shade one bubble**

The prime factors of 15 are:

- 1 and 15                       3 and 15  
 1 and 5                       3 and 5

**4 Shade one bubble**

The prime factors of 20 are:

- 2, 2 and 5                       2, 5 and 5  
 2, 4 and 5                       2, 5 and 10

**5 Shade one bubble**The first three square numbers are 1, 4 and 9.  
The next square number is:

- 10                       12  
 16                       20

**6 Shade one bubble**

The ninth square number is the same as the answer to:

- the sum of the first nine numbers  
 the sum of the first nine even numbers  
 the sum of the first nine odd numbers  
 the sum of the first nine square numbers

**7 Shade one bubble**

Which of these is the largest square number between 100 and 200?

- $13^2$                         $14^2$   
  $15^2$                         $16^2$

**8 Shade one bubble**

The thirteenth triangular number is:

- 13                       87  
 91                       113

NAME:

DATE:

1

- a** How do you know that 23 is a prime number?
- b** Arrange the two-digit numbers that have a 3 in the ones column into prime and composite numbers.
- c** Compare the number of prime numbers in Question 1b with the number of composite numbers.

2

- The number 9 has three factors. If you double 9, you double the number of factors. Does this pattern continue if you double 18 and then double 36?
- a** Write the factors for each number (9, 18, 36 and 72).
- b** What do you notice about the number of factors for each of the numbers?
- c** If you double 72, how many factors does the number have?

3

- a**  $2^2 = 4$ . This is also the answer to the sum of the first two odd numbers ( $1 + 3 = 4$ ). Does this pattern continue for other square numbers? ( $3^2 = 9$  and  $1 + 3 + 5 = ?$ ) Write down your findings.
- b** Use this information to find a quick way to calculate the answer to:  
 $1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21 + 23$

4

- a** The first two triangular numbers are odd: 1 and 3. Are there any even triangular numbers? Look at the sequence of triangular numbers lower than 100 to find out.
- b** How does the sequence of triangular numbers compare with the sequence of square numbers?

# FROM ASSESSMENT TO INSTRUCTION: TEACHER SUPPORT

Unit	Topic	Focus	Possible next step for students who are working below the achievement standard	Possible next step for students who are working above the achievement standard
<b>1A</b>	Place value	Explore Base 10 system with numbers of any size	<ul style="list-style-type: none"> <li>Ensure that the student understands the concept of ones and tens, hundreds then thousands</li> <li>Undertake practical work with Base 10 blocks using two-, three- and four-digit numbers</li> </ul>	<ul style="list-style-type: none"> <li>Explore other counting systems, such as the Mayan System (uses Base 20) or the Babylonian System (uses Base 60)</li> </ul>
<b>1B</b>	Number properties	Explore prime and composite numbers, triangular and square numbers and factor trees	<ul style="list-style-type: none"> <li>Explore shortcuts for multiplication and division by looking at factors and multiples</li> </ul>	<ul style="list-style-type: none"> <li>Define and compare prime and composite numbers and explain the difference between them</li> <li>Express whole numbers as products of powers of prime factors</li> </ul>
<b>1C</b>	Mental strategies for addition and subtraction	Explore mental strategies for addition and subtraction including jump, split and compensation strategies using two-, three- and four-digit numbers	<ul style="list-style-type: none"> <li>Explore mental strategies for addition and subtraction including jump and compensation strategies using two- and three-digit numbers</li> </ul>	<ul style="list-style-type: none"> <li>Explore various laws such as the associative, distributive and commutative laws to discover how these can simplify calculations</li> </ul>
<b>1D</b>	Written strategies for addition and subtraction	Work with horizontal and vertical algorithms. Expand and round numbers. Estimate and check answers.	<ul style="list-style-type: none"> <li>Revisit place value concepts</li> <li>Work with horizontal and vertical algorithms with numbers of four, then five, digits. Expand and round numbers of up to five digits.</li> </ul>	<ul style="list-style-type: none"> <li>Addition and subtraction of positive and negative numbers</li> <li>Explore the use of the +/- key on a calculator</li> </ul>
<b>1E</b>	Mental strategies for multiplication and division	Explore mental strategies for multiplication and division including multiples and powers of 10, halving, doubling, rounding and estimating	<ul style="list-style-type: none"> <li>Explore mental strategies for multiplication and division using two- and three-digit numbers</li> </ul>	<ul style="list-style-type: none"> <li>Use index notation to express powers of numbers (e.g. <math>2 \times 2 \times 2 = 2^3</math>)</li> <li>Find square roots of numbers by estimating, factorising and with a calculator</li> </ul>
<b>1F</b>	Written strategies for multiplication and division	Explore methods of multiplying and dividing whole numbers	<ul style="list-style-type: none"> <li>Revisit methods of multiplying and dividing two- and three-digit numbers by a one-digit number, such as partitioning, the extended method for multiplication and the short method for multiplication and division</li> </ul>	<ul style="list-style-type: none"> <li>Multiply whole numbers by three-digit numbers</li> <li>Further explore methods to divide a three-digit number by a two-digit number without using a calculator</li> </ul>
<b>1G</b>	Integers	Explore positive and negative numbers on a number line and in real-life situations	<ul style="list-style-type: none"> <li>Locate and direct whole numbers on a number line using positive numbers only</li> <li>Use a calculator with simple operations such as <math>3 - 5</math>, predicting the answer where possible</li> </ul>	<ul style="list-style-type: none"> <li>Begin to simplify and evaluate complex number sentences (e.g. <math>3 - (-2) = 3 + 2 = 5</math>)</li> <li>Key negative numbers into a calculator using the +/- key</li> </ul>



## Oxford Maths Assess is a comprehensive mathematics assessment solution for Years 2 to 6 that provides both assessment of and assessment for learning.

Linked explicitly to the Australian Curriculum and NSW Syllabus for the Australian Curriculum, *Oxford Maths Assess* blends seamlessly with any maths teaching resource or approach.

*Oxford Maths Assess*:

- is easy for teachers, students and parents to follow
- provides teachers with assessment content that shows basic understanding and fluency of a topic, and also provides students with content that enables them to:
  - think about their understanding of a topic
  - extend themselves by applying the concepts further or by comparing different ways of working
  - show and explain the way they have solved a problem or why a method does or doesn't work
- provides evidence of a student's level of achievement in every content strand of mathematics (assessment of learning), but also provides teachers with verification of a student's proficiency level in the key areas of understanding, fluency, problem solving and reasoning (assessment for learning)
- includes a grading guide and suggestions for students who are achieving beyond or below the expected level of achievement.

### PART 1: ASSESSMENT OF LEARNING

The assessment *of* learning is designed to help the teacher (and the student) measure progress towards achievement standards. The aim of this assessment is to find out what a student has learned and to help answer questions such as:

- Where was the student?
- Where is the student now?
- Where does the student need to go to next?

### PART 2: ASSESSMENT FOR LEARNING

Assessment *for* learning differs from assessment *of* learning because its main focus is inquiry into the learning process. Teachers are able to look at the way students learn, rather than at their level of achievement. This analysis can then inform future teaching and learning requirements.

This assessment focuses on students' level of development in the proficiency strands of the mathematics curriculum (understanding, fluency, problem solving and reasoning) and their ability to reflect on, reason, explain, explore and adapt key mathematical concepts.



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