For school teachers

Example unit plan – maths

This unit plan was developed by Ochre Education and maths teacher Sue Davis. It outlines her approach to teaching a Year 3 unit of maths on place value.

- Watch a video of Sue talking about her teaching practices
- View other lesson resources for this unit
- Download sample unit plan template
- Download sample lesson plan template
- View all other online lessons and supporting resources

Ochre Education and the Australian Education Research Organisation (AERO) have published 10 online lessons (and supporting resources) that make up this unit. The lessons are available here and you can watch a video of Sue talking about her teaching practices here.

This unit plan is a supplementary resource for this work. It includes guidance on how the unit was structured and sequenced and can be used while interacting with the Ochre resources. The plan also allows teachers to see an example of planning for a sequence of lessons and reflect on their own teaching and effective practice. The unit plan is annotated to explicitly show some of the decisions that are made during the planning process.

Another way to use this unit plan is as a starting point for discussions with colleagues to build collective capacity for lesson and unit planning. Teachers can also use the unit plan to reflect on their own planning for lessons and units and guide future planning. A blank unit plan teachers can use and modify as a resource for their own planning can be accessed here.

All the lessons from this unit can be accessed for free on either the AERO or Ochre Education websites.

Definitions

Knowledge

Awareness of pieces of information (such as facts, people and skills).

Learning objectives

Clear and easy-to-understand statements about what students are expected to be able to know, do and/or understand by the end of a period of instruction (not to be confused with the instructional tasks), and at what level this learning is to take place.

Tasks

Activities undertaken by students as part of the learning process. Carefully designed tasks can also assist students in mastering new knowledge or skills. Scaffolds and worked examples might be used to assist students with some tasks. Teachers can monitor their students' ability to complete tasks as part of a formative assessment approach to help determine whether students have demonstrated the success criteria.

Skills

Abilities and actions students can do using their understanding and knowledge.

Success criteria

A clear statement about the measure that will be used to prove whether, and how well, a student has met the learning objectives by the end of a period of instruction.

Understanding

The awareness of connections between pieces of information (such as facts, people and skills), that draw on students' knowledge.

Subject: Maths

Year level/Stage: Year 3

Length

10 lessons
2 weeks' class time

Unit Name and Australian Curriculum Links

Place value

- AC9M3N01
- AC9M3N03
- AC9M3N05
- AC9M3N07

These content descriptors can be accessed at V9.0 of the Australian Curriculum website.

Unit objectives

Students should be able to:

- know how to apply place value to determine the value of a digit
- use place value charts and base ten blocks to model number values
- match numerals with representations of number values
- read 4-digit numbers with correct phrasing
- use a series of digits to construct numerals of different value
- compare numerals of differing lengths to identify which has the greatest value
- use symbols of inequality to demonstrate the value relationship between 2 or more numbers
- construct a number line, including equally spaced labelled intervals
- identify and place a 4-digit number on a number line.

Learning sequence and mastery learning – pre-requisite units/skills*

This unit builds on understandings from the Year 2 Digits and amounts unit, which works with 2-digit numbers and exchange between ones and tens place values.

Specifically, students will need to have one-to-one correspondence, digit recognition and an understanding of quantity. They also need to be able to count into the 100s and recognise that one 10 consists of 10 ones and that one 100 consists of 10 10s.

Learning sequence and mastery learning – post units/skills

Year 4 'Using 5-digit numbers' unit addresses AC9M4N01, AC9M4N02 and AC9M4N05, and builds on ideas developed in this unit.

* A good curriculum is constructed as a continuous sequence of learning that stretches over a number of years. It is important to consider what knowledge and skills students are likely to have had access to before this unit, as the lessons in this unit can both review and build upon these ideas

In addition, there will be future units that rely on the knowledge and skills built in this unit. It is important to know what future learning relies on this unit, as it will help inform our decisions about what students need to know and be able to do as they approach future units.

Unit learning objectives

The learning objectives describe what students should know and be able to do at the end of the unit of learning. This list helps make explicit what the expected outcomes of the unit are. This information is useful in sequencing the unit – it is a place to keep checking back to in order to make sure that the lessons in the unit address each of these aspects.

Understanding	Knowledge	Skills	Vocabulary
Students will understand: • the position of a digit within a number determines its value • the same digit can have a different value depending on its position in a number • that numbers give indications of value size, and that we can compare sizes of values using the digits in place values • that number lines are used to show the difference between 2 or more numbers • each place value can contain a single digit only • rounding is used in everyday life to give easily understood estimations • problem solving involves a number of steps • it is helpful to write down workings, particularly for more complex problems.	Students will know: • each increase in 1 place value column is worth 10 of the preceding column • the order of the place values in a number and the multibase arithmetic block (MAB) each represents • the < and > symbols can be used to show relative value. • the intervals on a number line must be equally spaced • that values over 9 in a particular place value must be exchanged for a larger place value • numbers are rounded according to the digit following the place value to be rounded to • that to solve problems you need to have a plan of steps.	Students will be able to: • use place value charts and manipulatives to model number values • Read 4-digit numbers with correct phrasing • match numerals with representations of number values • use place value to identify the value of each digit in a number • partition numbers using regrouping • label a number line using intervals of equal size • identify an interval on a number line • add and subtract multiples of 10, 100 and 1000 to numbers • identify multiples of 10 and 100 • Round 3- and 4-digit numbers to the nearest 10 and 100 • apply number properties to solve problems • develop a set of steps to problem-solve • identify numbers as odd and even.	Digit, numeral, place value, partition, comparing, ordering, add, addition, subtract, subtraction, trading, exchange, multiple, rounding, properties, solution, regrouping.

Evidence of learning

The evidence of learning considers what tasks we might set to check that students are making progress in the unit. It describes key tasks set at intervals throughout the unit that are used to make a judgement about how well students are progressing towards the learning objectives.

What evidence will we look for to determine whether students have made progress and mastered the unit objectives?

What will understanding and skill look like?

Task 1

Students will use symbols of inequality to compare numbers of varying value.

Task 2

Students will add blocks to a place value requiring multiple exchanges.

Task 3

Students will partition 4-digit numbers using double digit amounts from some place values.

See Appendix for tasks and sample responses.

Lesson stages

Lesson stage	Review and recap Mastery learning	New learning	Formative assessment Check for understanding
	What skills and knowledge should students practice as part of their introduction? What skills and knowledge are required for this lesson? How will students retrieve this knowledge?	What knowledge will be introduced in this lesson? How will the new learning be broken down to avoid overloading students? How will the new learning be spaced? How will the new learning be broken down into smaller chunks?	How will we know if students have mastered the skills and content? How will planned future lessons in this unit be reviewed given the level of mastery displayed in the formative assessment?
Lesson 1 Reading and writing digit numbers	Introductory quiz focus: the relationship between the digits in a number and its value and matching the names of 2 and 3-digit numbers to their values.* Recap definitions of digits and numerals. Count the number of digits in a given number.	Write a 4-digit number in a place value chart. Include examples where there are zero digits in the number. Practise saying the number as it is being written into the chart. Use MABs to show the value of thousands, hundreds, tens and ones. Match numbers to the MABs and then reverse, selecting MABs to represent a 4-digit number with opportunities for practice.**	Multiple points of checking for understanding, identifying number of digits in a number and the links between the representation of a number and its value. Exit quiz focus: assessing mastery of learning objectives from this lesson, particularly the value of a digit given its place in a number and finding a numeral representation given MABs.

* The first quiz gives us an idea of what knowledge students bring into the lesson relating to the topic being studied. The focus is on the knowledge and skills that are 'building blocks' for the lessons to come. What is it that these lessons rely on them knowing?

** The unit plan is different to a lesson plan. The full lesson plan will describe the ways in which the lessons are structured and paced. The unit plan describes how the learning objectives are sequenced and arranged across the unit. It helps define the focus of each lesson.

Lesson stage	Review and recap Mastery learning	New learning	Formative assessment Check for understanding
	What skills and knowledge should students practice as part of their introduction? What skills and knowledge are required for this lesson? How will students retrieve this knowledge?	What knowledge will be introduced in this lesson? How will the new learning be broken down to avoid overloading students? How will the new learning be spaced? How will the new learning be broken down into smaller chunks?	How will we know if students have mastered the skills and content? How will planned future lessons in this unit be reviewed given the level of mastery displayed in the formative assessment?
Lesson 2 Partitioning numbers	Introductory quiz focus: the value of a digit given its place in a number and finding a numeral representation given MABs. Review the relationship between the position of a digit in a numeral and its value, using place value charts and MABs.	Using the numeral 1111, address the concept that the same digit can have different values in a 4-digit number. Use place value blocks to show this difference, then apply to other numbers. Introduce partitioning based on place value, starting with 3-digit numbers before moving to 4-digit numbers. Move to partitioning numbers in different ways. Start with 2-digit numbers before moving to 3 and 4 digits.	Several checks on mini whiteboards for understanding of the relationship between digits and values. Worksheet questions regarding the partitioning of numbers. Exit quiz focus: assessing mastery of learning objectives from this lesson, particularly partitioning numbers based on place value.

Lesson stage	Review and recap Mastery learning	New learning	Formative assessment Check for understanding
	What skills and knowledge should students practice as part of their introduction? What skills and knowledge are required for this lesson? How will students retrieve this knowledge?	What knowledge will be introduced in this lesson? How will the new learning be broken down to avoid overloading students? How will the new learning be spaced? How will the new learning be broken down into smaller chunks?	How will we know if students have mastered the skills and content? How will planned future lessons in this unit be reviewed given the level of mastery displayed in the formative assessment?
Lesson 3 Ordering and comparing	Introductory quiz focus: partitioning numbers based on place value. Review place value by drawing MABs to represent 4-digit numbers.	Use MABs to compare 4-digit numbers. Begin with changes to the thousands place, and then compare numbers with the same digits in the thousands but differing in the hundreds and tens places. Students draw the MAB for 2 numbers, using the blocks to compare the values of each. Move to examples comparing digits only – no MAB representation. Introduce < and > symbols as measures of comparison. Students compare MAB representations of numbers using inequalities. Then move to using place value charts to make the same comparisons.*	Frequent checks along each stage – small tasks, gradually reducing the amount of scaffolding each time. Use mini whiteboards and quick worksheet activities to show mastery. Exit quiz focus: assessing mastery of learning objectives from this lesson, particularly comparisons of the sizes of numbers based on MAB and digit representations.**

* A good unit plan carefully considers the sequence of learning. In particular, the amount of new learning in each lesson needs to be moderate. It is tempting to use most of the lesson time on new information to 'get through the content'. However, setting aside time for appropriate re-teaching and practice is absolutely crucial to ensure students master the content being taught.

** Formative assessment is an important aspect of lesson design and should be included in the unit plan. Information from the formative assessment tasks can be used to adjust the lesson or planned future lessons in the unit.

The adjustments made from the formative assessment information must be balanced. It is important that the intended learning is secure; however, there is also a sequence of learning in the unit that is important. Spending more time on re-teaching and rehearsal of a concept need to be balanced with the need to give students the opportunity to learn further concepts.

Lesson stage	**Review and recap** Mastery learning	**New learning**	**Formative assessment** Check for understanding
	What skills and knowledge should students practice as part of their introduction? What skills and knowledge are required for this lesson? How will students retrieve this knowledge?	What knowledge will be introduced in this lesson? How will the new learning be broken down to avoid overloading students? How will the new learning be spaced? How will the new learning be broken down into smaller chunks?	How will we know if students have mastered the skills and content? How will planned future lessons in this unit be reviewed given the level of mastery displayed in the formative assessment?
Lesson 4 Number lines	Introductory quiz focus: comparisons of 4-digit numbers and the use of signs of inequality. Review place value by drawing MABs to represent four digits numbers.	Introduce number line and the concept of an interval as the difference between marked lines. Students identify the interval on a given number line and then find the missing labels on a line. Place 2-digit numbers on a number line, starting with those sitting on an interval and then between intervals. Given three numbers, place them on a number line and use inequalities to describe the relationship between them.* Move to placing 4-digit numbers on the number line, using numbers from tables and other sources of information.	Numerous number line exercises, complete on mini whiteboard or on worksheets. Also, verbal questioning of students in guided practice. Exit quiz focus: assessing mastery of learning objectives from this lesson, particularly intervals on number lines and comparing magnitudes of 2-, 3- and 4-digit numbers.

* There may be some instances in the unit where there is a key task that is known to be effective, and so it can be included in a little bit of detail in the unit plan.

Lesson stage	Review and recap Mastery learning	New learning	Formative assessment Check for understanding
	What skills and knowledge should students practice as part of their introduction? What skills and knowledge are required for this lesson? How will students retrieve this knowledge?	What knowledge will be introduced in this lesson? How will the new learning be broken down to avoid overloading students? How will the new learning be spaced? How will the new learning be broken down into smaller chunks?	How will we know if students have mastered the skills and content? How will planned future lessons in this unit be reviewed given the level of mastery displayed in the formative assessment?
Lesson 5 Adding 10, 100 and 1000	Introductory quiz focus: a range of skills form the first four lessons, including conversions between MAB and numerals and comparison of the magnitude of numbers. Review the relationship between the position of a digit in a numeral and its value, using place value charts and MABs.	Add 10s to a 4-digit number, with required regrouping. Emphasise the change to that place value only, using MABs. Then add multiples of 10. Repeat for 100s and 1000s, using place value and MABs as scaffolds. Then move to place value changes that require regrouping, including regrouping across multiple place values (such as adding 10 to 3999).*	Use questions relating to the exchange across place values as the hinge point question. Collate answers by mini whiteboard or worksheet. Exit quiz focus: assessing mastery of learning objectives from this lesson, particularly variations on the addition of 100 and 1000 on number lines, numerals and MABs.

* Note the sequencing of information – chunking new elements into small sections and checking for understanding.

Lesson	**Review and recap** Mastery learning	**New learning**	**Formative assessment** Check for understanding
	What skills and knowledge should students practice as part of their starter? What skills and knowledge are required for this lesson? How will students retrieve this knowledge?	What knowledge will be introduced in this lesson? How will the new learning be broken down to avoid overloading students? How will the new learning be spaced? How will the new learning be broken down into smaller chunks?	How will we know if students have mastered the skills and content? How will planned future lessons in this unit be reviewed given the level of mastery displayed in the formative assessment?
Lesson 6 Subtracting 10, 100 and 1000	Introductory quiz focus: partitioning of numbers with placeholders and comparisons of 4-digit numbers. Review the relationship between the position of a digit in a numeral and its value, using place value charts and MABs.	Subtract 10s from a 4-digit number, with required regrouping. Emphasise the change to that place value only, using MABs. Then subtract multiples of 10. Repeat for hundreds and thousands, using place value and MABs as scaffolds. Then move to place value changes that require trading.	Use questions relating to the trading across place values as the hinge point question. Collate answers by mini whiteboard or worksheet. Exit quiz focus: assessing mastery of learning objectives from this lesson, particularly variations on the subtraction of 100 and 1000 on number lines, numerals and MABs.*

* Note that the review sessions primarily focus on the knowledge and skills that the lesson builds upon. When considering what to review, start with what knowledge is required for the coming lesson, and the degree to which the students have demonstrated competence.

The review also forms a key component of mastery learning, providing the opportunity to re-teach elements where required.

Lesson	**Review and recap** Mastery learning	**New learning**	**Formative assessment** Check for understanding
	What skills and knowledge should students practice as part of their starter? What skills and knowledge are required for this lesson? How will students retrieve this knowledge?	What knowledge will be introduced in this lesson? How will the new learning be broken down to avoid overloading students? How will the new learning be spaced? How will the new learning be broken down into smaller chunks?	How will we know if students have mastered the skills and content? How will planned future lessons in this unit be reviewed given the level of mastery displayed in the formative assessment?
Lesson 7 Rounding	Introductory quiz focus: partitioning and additions and subtractions of 100 and 1000 from numbers.	Importance of rounding – where is rounding observed in everyday life? Introduce multiples of 10, how they are identified and how to find missing multiples in a list. Review of rounding numbers to the nearest 10 using a number line representation, ensuring to demonstrate using a variety of 2-, 3- and 4-digit numbers. Scaffold using charts where thousand and hundred place values are kept constant. Repeat rounding to nearest hundred.	Pause points where multiples of 10 are identified from a group of numbers. Rounding to nearest ten and hundred on worksheet questions and exit quizzes. Exit quiz focus: assessing mastery of learning objectives from this lesson, particularly rounding to nearest hundred including working backwards to find possible numbers before rounding.

Lesson	**Review and recap** Mastery learning	**New learning**	**Formative assessment** Check for understanding
	What skills and knowledge should students practice as part of their starter? What skills and knowledge are required for this lesson? How will students retrieve this knowledge?	What knowledge will be introduced in this lesson? How will the new learning be broken down to avoid overloading students? How will the new learning be spaced? How will the new learning be broken down into smaller chunks?	How will we know if students have mastered the skills and content? How will planned future lessons in this unit be reviewed given the level of mastery displayed in the formative assessment?
Lesson 8 Applying place value	Introductory quiz focus: a range of problems related to partitioning and comparison of the magnitude of numbers. Using given digits to produce the largest and smallest possible numbers. Link to MAB representation. Review multiples of 10 and 100, finding missing values and rounding to 10 and 100.	Introduce a table of values and how to read from the table. Students use a number line to place the values from the table, round to nearest ten and then make a calculation based on the rounded value (for instance, a cyclist riding at 10km/h – about how long will the journey take?)	Construction of lowest and highest numbers given digits and from student-developed digit list on mini whiteboards.* Selection of numbers with certain properties from a table of values. Exit quiz focus: assessing mastery of learning objectives from this lesson, particularly identifying the highest and lowest numerals that can be made from a series of given digits, and comparisons of magnitude given a series of numbers.

* Use a variety of representations to collect information about student progress. Working at the sentence level and then moving to the paragraph level can help scaffold the complexity of the task and provide more information about the level of student understanding.

Lesson	**Review and recap** Mastery learning	**New learning**	**Formative assessment** Check for understanding
	What skills and knowledge should students practice as part of their starter? What skills and knowledge are required for this lesson? How will students retrieve this knowledge?	What knowledge will be introduced in this lesson? How will the new learning be broken down to avoid overloading students? How will the new learning be spaced? How will the new learning be broken down into smaller chunks?	How will we know if students have mastered the skills and content? How will planned future lessons in this unit be reviewed given the level of mastery displayed in the formative assessment?
Lesson 9 Finding solutions	Introductory quiz focus: identifying the highest and lowest numerals that can be made from a series of given digits, and comparisons of magnitude given a series of numbers. Review identification of odd and even numbers. Students identify number as odd or even.	Introduce the concept of problem solving in mathematics. Emphasise that often it relies on multiple steps and that identifying these steps helps you make a plan to solve the problem. Model a simple question where students need to identify a number that satisfies several given properties. Students then attempt similar problems. Model finding answers without number sets using a number line. Students then attempt similar problems.	Identification of odd or even numbers from a list. Application of problem-solving steps to a problem. This can be done as a slow-motion mini whiteboard activity. Exit quiz focus: assessing mastery of learning objectives from this lesson, particularly applications of rounding and finding numbers whose properties match a number of conditions.

Lesson	**Review and recap** Mastery learning	**New learning**	**Formative assessment** Check for understanding
	What skills and knowledge should students practice as part of their starter? What skills and knowledge are required for this lesson? How will students retrieve this knowledge?	What knowledge will be introduced in this lesson? How will the new learning be broken down to avoid overloading students? How will the new learning be spaced? How will the new learning be broken down into smaller chunks?	How will we know if students have mastered the skills and content? How will planned future lessons in this unit be reviewed given the level of mastery displayed in the formative assessment?
Lesson 10 Revision	Introductory quiz focus: partitioning and representing a comparison of the magnitude of values using <, > and =. Review the relationship between the position of a digit in a numeral and its value, using place value charts and MABs. Form as many numbers as possible given a list of digits, and then order the numbers in terms of magnitude. Review partitioning with and without regrouping. Include elements where some partitions are provided and the students need to provide the other partitions.	N/A	Exit quiz focus: mastery of learning objectives from this lesson, particularly aggregating partitioned numbers and forming numbers from a set of given values.

Appendix – Sample Evidence of Learning

Task 1

Students will use symbols of inequality to compare numbers of varying value.

Ordering and comparing four digit numbers – Worksheet

Use the 'greater than' > or 'less than' < symbol to make these statements correct

smaller < larger larger > smaller

4567 ☐ 4657	7777 ☐ 1777	1002 ☐ 1020
1893 ☐ 1839	3619 ☐ 3691	2900 ☐ 1999
2045 ☐ 245	1234 ☐ 4321	8562 ☐ 8563

Sample response showing evidence of understanding

Ordering and comparing four digit numbers – Worksheet

Use the 'greater than' > or 'less than' < symbol to make these statements correct

smaller < larger larger > smaller

4567 < 4657	7777 > 1777	1002 < 1020
1893 > 1839	3619 < 3691	2900 > 1999
2045 > 245	1234 < 4321	8562 < 8563

Task 2

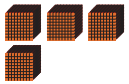
Students will add blocks to a place value requiring multiple exchanges.

What happens when we exchange more than once?

1000s	100s	10s	1s
			
3	9	9	9
3000	+ 900	+ 90	+ 9

3999
+ 1

Sample response showing evidence of understanding:

1000s	100s	10s	1s
			
3	9	9	9
3000	+ 900	+ 90	+ 9
3000	+ 900	+ 90	**+ 10**
3000	+ 900	**+ 100**	+ 0
3000	**+ 1000**	+ 0	+ 0
4000	+ 0	+ 0	+ 0

3999
+ 1
4000

Task 3

Students will partition four digit numbers using double digit amounts from some place values.

Regrouping and renaming

Fill in the blanks

6573
6573 – 6 thousands, 5 hundreds, 7 tens and 3 ones
6573 – ___ hundreds, 7 tens and 3 ones
6573 – 6 thousands, ___ tens and 3 ones
6573 – 6 thousands, 5 hundreds and ___ ones
6573 – ___ tens and 3 ones

Sample response showing evidence of understanding:

Regrouping and renaming

Fill in the blanks

6573
6573 – 6 thousands, 5 hundreds, 7 tens and 3 ones
6573 – 65 hundreds, 7 tens and 3 ones
6573 – 6 thousands, 57 tens and 3 ones
6573 – 6 thousands, 5 hundreds and 73 ones
6573 – 657 tens and 3 ones