For school teachers

Lesson plan – Year 3 maths

Unit 1, Lesson 1: Reading and writing 4-digit numbers

This lesson plan was developed by Ochre Education and maths teacher Sue Davis. It outlines her approach to teaching a Year 3 maths lesson on reading and writing 4-digit numbers.

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

This lesson is part of a unit on place value. Ochre Education and the Australian Education Research Organisation (AERO) have published 10 online lessons (and supporting resources) that make up this unit. This is the first lesson in the unit – you can watch the lesson video here and watch a video of Sue talking about her practice here.

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

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

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.

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. Success criteria are observable actions that a student can perform to demonstrate their understanding of the learning objectives. It is important that these elements are observable – avoid using phrases like 'students will understand that…' as we can't observe understanding. Instead, the criteria could be 'students will write, say, make or do something that indicates understanding'.

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.

Subject Mathematics: Place value

Year level/Stage 3

Lesson background

This is the first lesson in the place value unit, and the first lesson of Mathematics in Year 3. It builds upon the place value understanding developed in Year 2.

This lesson background shows how the lesson is sequenced and positioned within the unit.

Learning objectives

To understand the difference between digits, numerals and number values, and their relationships to place value.

Success criteria

By the end of this lesson, students will be able 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.

The success criteria are a series of clear statements that will be used to prove whether, and how well, a student has met the learning objectives at the end of a period of instruction.

Misconceptions

Some students may:

- write numerals as they are said; for example, 234 as 200304
- 'collapse' the numerals if there are zero units; for example, 4056 as 456 (without the digit '0' as place holder)
- think that a number is a '4-digit number' if it has the digit 4 in it, a '3-digit number' has the digit 3 in it, and so on
- think that a digit 2 in the hundreds is worth 2, rather than 200.

Misconceptions are incorrect knowledges and understandings that students have prior to the lesson, or may obtain during the lesson. Outlining these during planning can help with monitoring student learning, and recognising when corrective feedback is needed.

* In this column, you will find prompting questions to guide your planning for each lesson stage.

** In this column you will find prompting questions to consider when monitoring learning at each stage of the lesson.

Lesson stage*	Tasks What are the specific classroom or instructional activities that you and your students will use in each stage?	Monitoring student learning**
Review of previous learning		
How will you ensure that students have the prerequisite skills and knowledge to progress their learning in this lesson? How will you activate prior knowledge/help students retrieve relevant learning from previous lessons?	A quick introductory quiz of prior knowledge about place value and magnitude of numbers. The focus is on misconceptions around the role of 0 as a place holder and the relationship between each of the place value houses.*** 1. Overview of keywords: a. Place value b. Numeral c. Digit d. Thousands, hundreds, tens, ones e. Base ten blocks.	How will you gather evidence that shows you where your students are at in their learning?

*** It is important to get a sense of what students already know and are able to do. Formative assessment allows us to gather information to help inform decision making.

A quiz can provide information quickly, but formative assessment does not have to be so formal. You could also run a mini-whiteboard activity and ask students showing their thinking.

Note that several of the introductory quiz questions explore common misconceptions, particularly the idea that the numeral 253 is written as 200503. Information gathered from this quiz can help identify which students to work with to clarify this misconception.

Lesson stage*	**Tasks** What are the specific classroom or instructional activities that you and your students will use in each stage?	**Monitoring student learning****
(continued) How will you ensure that students have the prerequisite skills and knowledge to progress their learning in this lesson? How will you activate prior knowledge/help students retrieve relevant learning from previous lessons?	2. Opening questions and ideas:**** a. Digits, numerals and numbers b. Dot drawing to indicate value of numbers c. Counting digits, including the misconception that the left-hand digit is the number of digits. Using a variety of representations (dot, numeral, place value chart) and multiple-choice questions to detect any misconceptions.	(continued) How will you gather evidence that shows you where your students are at in their learning?

**** We have gone back to first principles here with some of these ideas. Students sit along a continuum of skills coming into the unit, so we need to check that they have the requisite skills and knowledge for the lesson.

There are some aspects we need to master here before we move on. Without an understanding of the terminology, the lack of distinction between digits, numerals and numbers can cause confusion for your students.

The number of digits is usually quite a quick review for some, but I know that some students confuse the number of digits with the value of the last digit in a number, so we deliberately test for and highlight that misconception.

Lesson stage	Tasks What are the specific classroom or instructional activities that you and your students will use in each stage?	Monitoring student learning
Explicit teaching of new learning ('I do') – place value chart representation		
How will you communicate the learning objectives to students? How will you break down your content into sequential steps to avoid overloading your students' working memory? How will you model the learning to support student understanding?	**Whole class:** 1. Read the learning objectives and success criteria to students, referencing back to them as they are encountered throughout the lesson. 2. Place value understanding is broken into concrete steps, each of which has an 'I do, we do, you do' cycle:* a. place value chart b. base ten block representations to numeral c. numeral to base ten block representations. 3. Teach the class how to use a place value chart, linking the numeral with its value in the chart. Work through each question aloud, using your fingers to count out the digits. Use the choral response technique by repeating numbers of varying lengths out loud, then demonstrate how to place those numbers on a place value chart.** 4. Check the starter quiz for the misconception that a number like 234 could be represented as 200304. If this is the case, use mini whiteboards to check for this misunderstanding using 142 and 278.***	How will you help students retrieve information learned in previous lessons, units? How will you check for understanding and correct any errors or misconceptions before moving onto guided practice?

* I decided to separate out these three components, gradually building students' mastery of each before moving on to more complex representations and removing scaffolds. It is important that students have the opportunity to practise and master these points before removing scaffolds.

** Here, I am introducing new ideas using explicit instruction. I break down the lesson into small chunks, with suitable scaffolds, and teach students to work with place value at each stage. Then I provide opportunities for guided and independent practice.

The place value chart is a useful scaffold for students, particularly as they are learning to work with the concept. I decided to use a version that featured the place value heading with both numeral and word representations as some students are still learning to move flexibly between them. This additional scaffold is removed later in the lesson.

*** Here, I am using the information that was gathered from the formative assessment to make decisions about what my next moves are, and to anticipate possible difficulties.

Lesson stage	Tasks What are the specific classroom or instructional activities that you and your students will use in each stage?	Monitoring student learning
Guided practice ('We do') – place value chart representation		
What worked examples will you provide students? What scaffolds and instructional supports will you introduce, and how will students use these? How will students work together to progress their skills and understanding?	**Whole class:** 1. The main scaffold used in this lesson is the place value chart. Undertake guided practice of using the place value chart by: a. introducing a number using a choral response: 'How do we say this number? Let's do it together.' b. prepare for some practice reading and verbalisation of the numbers. 2. Gradually increase the difficulty and model how to express numbers verbally and in written form. Present 4 worked examples of placement of a number in a place value chart, ensuring the examples are numbers of varying lengths and that a 'place holder' zero is one of the examples. 3. Use mini whiteboards for the students to write their responses. Look for students who are struggling with how to place the digits.* 4. Encourage students to complete the independent practice questions in the following 'You do' phase. Explain that there will be opportunities for more difficult examples in the later tasks of the worksheet.	How will you check for understanding and correct any errors or misconceptions before allowing students to independently practice?

* This is an important hinge point in the lesson and I want to collect information about what my students have learnt, by using formative assessment.

At this point we are still learning as an entire class. I use a mini-whiteboard for this information, as the task itself is easy to represent on the boards and I can quickly scan the room for information. I check for misconceptions across the room, and choose some boards with different answers, if they are available, to discuss how they are different and what might have happened in each case.

In this lesson I repeatedly address occasions where there is a zero in one of the place value columns. I always start with all non-zero numbers, as it is an easier representation, and move to numbers like 5097 that have the place holder.

Also, the length of the number matters. I can't assume that just because students can effectively transfer across place values for two and three digit numbers that this will automatically transfer to numbers with more digits. This is particularly relevant as this is the first lesson on place value with the new expectation of understanding four digit numbers.

Lesson stage	Tasks What are the specific classroom or instructional activities that you and your students will use in each stage?	Monitoring student learning
Independent practice ('You do') – place value chart representation		
How will students display that they have mastered the skills and content? How will you work with students to provide support and to gain insight into their learning?	**Independent:** Encourage all students to work on the independent practice questions, to help with fluency. Pose 4 quick questions for practice as a review of learning from the previous year. The last of the questions should be more difficult, with zeroes in two place values.* **Small groups:** Some students may need more guided practice. Gather these students into a small group and work through one more example before giving them the opportunity to work independently.	What formative assessment will you gather to provide feedback to your students?

* When working in a classroom environment, we move to independent practice, with students working on their own. I gather together some of the students who require more guided practice and work on one or two more examples before releasing them to independent practice.

Sometimes the temptation is to skip through these types of practice assuming the students will be comfortable with them. I think, given that the set of questions is relatively small, that all students should complete them. Even students who have a secure understanding of place value would benefit from some rehearsal focusing on accuracy and fluency of technique, particularly given this is the start of the unit.

It is also worth circulating here and checking workings – this is a foundational concept that the rest of the unit hinges on and mastery of it is important. Check everybody- sometimes there are some surprises where some students unexpectedly have difficulty.

Lesson stage	Tasks What are the specific classroom or instructional activities that you and your students will use in each stage?	Monitoring student learning
Explicit teaching of new learning ('I do') – base ten block representations to numeral		
	Whole class: 1. Introduce the class to base ten blocks representation for the thousands to ones places:* a. Model the counting of base ten blocks from each place value first, before adding them to the place value chart and then collapsing them into a single numeral.** b. Start with numerals that have non-zero values in each place value. 2. Model the thousands and the hundreds position. Ask for choral responses for the digits that should be entered into the last 2 positions.***	

* Base ten blocks are excellent manipulatives for working with place value, to enable students to visualise the value of digits and numbers. It is important to refer to them as 'base ten blocks' and not by a brand name - this connects their purpose to the mathematical concept of the decimal system and avoids confusion for those unfamiliar with the brand names. For the same reason, the blocks are referred to as their value, ie 'tens', not 'flats' or 'longs', as these terms have no link to their purpose and meaning.

** I allocate an amount of time that I feel is going to be appropriate for the independent work, but also keeping an eye on the workings of the class. When I feel that I am seeing consistent mastery, I regain the class's attention and begin whole-class teaching again.

This feels slow, but is an important division. Some students find it difficult to move from the base ten blocks straight to the numeral. The main aspect it affects is when there are no blocks for a place – for example, in the 4031 there are no hundreds blocks. In the absence of the place value chart, some students will just count the number of blocks they have of each type and not recognise the absence of one type of block, potentially ending up with 431. Therefore, I make sure to break this into two distinct steps.

*** Choral responses are really useful ways of quickly getting an idea of where students are at. I watch and listen carefully for students who are not replying as expected. If there are unsure students, I ask a couple of other students to repeat the number in turn and then ask one who wasn't sure to give them the opportunity to say the number correctly.

Lesson stage	Tasks What are the specific classroom or instructional activities that you and your students will use in each stage?	Monitoring student learning
Guided practice ('We do') – base ten block representations to numeral		
	Whole class: 1. Model using two examples of different numbers of digits – 2463 and 4540. The first (2463) has base ten blocks in each place value, whereas the second (4540) has no units. Reiterate that we use a zero in that place value to show it has no units.* 2. For students that are finding this easy, remove the place value chart and encourage them to move straight from the base ten block representation to the numeral.	

* This guided practice is important. I work through each step with the students, asking them what we should do at each step. If this is proving tricky, I might add additional examples to work through together prior to release.

Lesson stage	Tasks What are the specific classroom or instructional activities that you and your students will use in each stage?	Monitoring student learning
Independent practice ('You do') – base ten block representations to numeral		
	Independent: Encourage all students to work on the independent practice questions, to help with fluency. Pose 4 quick questions for practice as a review of learning from the previous year. The last of the questions should be more difficult, with zeroes in two place values.* **Small groups:** Some students may need more guided practice. Gather these students into a small group and work through one more example before giving them the opportunity to work independently. Students who need extra practice can try worksheet task 5, with several additional questions related to the use of zeroes in some place values. There is also the opportunity to have students come up with their own 4-digit numbers and draw base ten block representations. Alternatively, give them 4 digits and then ask them to find the highest and lowest value possible using those 4 digits once each in a number.**	

* When working in a classroom environment, we move to independent practice, with students working on their own. I gather together some of the students who require more guided practice and work on one or two more examples before releasing them to independent practice.

Sometimes the temptation is to skip through these types of practice assuming the students will be comfortable with them. I think, given that the set of questions is relatively small, that all students should complete them. Even students who have a secure understanding of place value would benefit from some rehearsal focusing on accuracy and fluency of technique, particularly given this is the start of the unit.

It is also worth circulating here and checking workings – this is a foundational concept that the rest of the unit hinges on and mastery of it is important. Check everybody- sometimes there are some surprises where some students unexpectedly have difficulty.

** Some students will have a reasonable grasp of place value. Having students working with numbers that they need to work on with fewer scaffolds helps raise the level of challenge and stretches their understanding of place value. Not that this is not an activity that is considerably different to the alternate activity – a small change can raise the level of challenge.

Lesson stage	Tasks What are the specific classroom or instructional activities that you and your students will use in each stage?	Monitoring student learning
Explicit teaching of new learning ('I do') – numeral to base ten block representations		
	1. The final step is the reversal of the previous idea – take numerals and represent them as base ten blocks. Explicitly demonstrate splitting this process into two main steps:* a. Placement of digits in the appropriate place values. b. Drawing of the base ten blocks. 2. Use 2456 as the starting numeral for this explicit instruction step.	
Guided practice ('We do') – numeral to base ten block representations		
	Present two worked examples of different numbers of digits – 1436 and 4053. The first (1436) has base ten blocks in each place value, whereas the second (4053) has no hundreds. Reiterate that we use a zero in that place value to show it has no units.	
Independent practice ('You do') - Numeral to base ten block representations		
	1. Encourage all students to work on the independent practice questions, to help with fluency. Then ask students then move on to worksheet task 6, with several additional questions related to the use of 0s in some place values. 2. For advanced students, provide 4 digits and then ask them to find the highest and lowest value possible using those 4 digits once each in a number.	

* Again, I am using the place value chart to help structure the question and deal with the concept of a place holder.

Lesson stage	Tasks What are the specific classroom or instructional activities that you and your students will use in each stage?	Monitoring student learning
Lesson summary		
How will you show students how far they have come in the lesson? How will you review their learning? How will you help students reflect on, or summarise the most important parts of their learning?	1. Review the success criteria from the lesson, pointing to specific skills demonstrated by the students.* 2. Use the exit quiz to get a sense of what students know and are able to do as a result of the lesson.**	What evidence will you gather from your students to understand what you may need to review next lesson?

* Reviewing the success criteria is important – what did we do in the lesson and what do we know and what have we learned in our time together?

** This is a final attempt to gain information about what the students can do as a result of the lesson (formative assessment). The quiz has two purposes – it lets students test their understanding of the concepts and it allows the teachers to gain a deeper understanding of what students have understood from the lesson.