

## Australian Curriculum YR 4

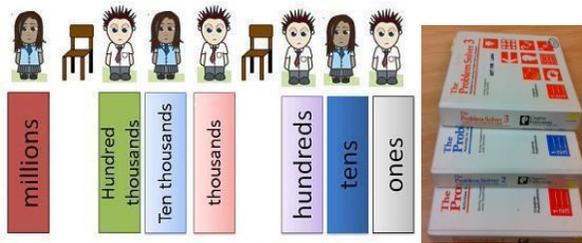
**ACMMA073** Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems

### Key Idea

Recognising and demonstrating that the place-value pattern is built on the operations of multiplication or division of tens

### Resources

- FISH problem solving cards
- The Problem Solver Series
- Number Cards/Number Chain Cards.



### Introductory Activity Process-What would you rather.

Two students start with a number card each. Eg. 3 or 8. Ask students to identify the bigger number. Explain that we are going to demonstrate using operations to increase each. Pose a question-Will the value of 8 digit remain larger? Display  $\times 10$   $\times 100$   $\times 1000$  cards. Ask a student to display multiplication operation symbol card. Ask students what we need to do to make that number  $\times 10$ . We need another zero to be added to the digit. On blank cards write one zero and have volunteers hold them and stand beside the students with the original. Repeat with  $\times 100$

and  $\times 1000$ . Review if the value of the digits are still the same or have they have changed. Review with students the order of the place values. Hundreds to Tens of Thousands.

### Make a number slider

Make a number slider to reinforce to learners that when we multiply or divide a number by 10 or 100 it changes its place value, but the digits don't change they move as a whole.

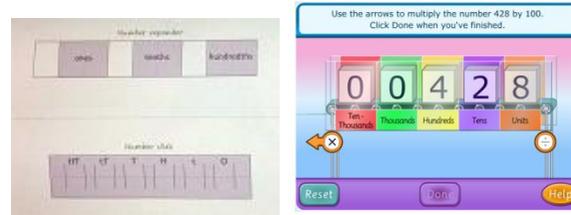
<https://www.eduweb.vic.gov.au/edulibrary/public/teachlearn/student/mathscontinuum/slidenumber.pdf>

### Use a Number expander

Allows learners to see that the number doesn't change just the way we say it or classify the number changes.

Students construct both items and use them in teacher directed questions e.g.

Students write review of their learning in their student journals. Starter stems.



<http://www.kidsmathgamesonline.com/numbers/placevalues.html>

For additional consolidation of concept use above website to give students the opportunity to engage in a place value activity.

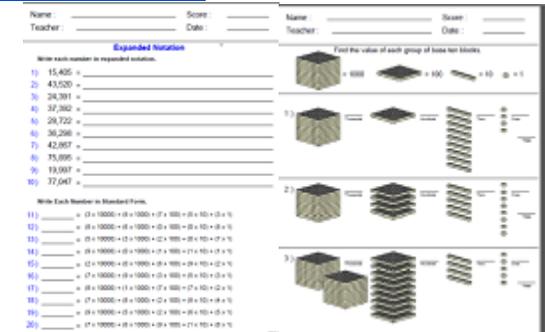
### Activity Process-Addition and Place value:

Write a simple addition sum that involves carrying.  $8 + 4$ . Discuss with students what they actually did with the 1, it is really 10 ones. When we add numbers what happens when we have more than 10 or too many numbers in one place value? It carries over to the next column as one larger. A demonstration with blocks and mabs should be a review for students with the teacher checking for understanding.

### Activity Process-

Teachers can access the website below and make a range of worksheets for students if you select place value on the left side. Create worksheets for students where they use mab blocks and their number expanders, for scaffolding.

<http://www.math-aids.com/>



### Activity Process-Random Numbers selection

Pull out several random numbers. 1 to 9 including 0 out of a hat. Students then have to make numbers that fit teacher's criteria. For example. The number must be even, must have more than 27 hundreds, must have an odd number in the tens column.

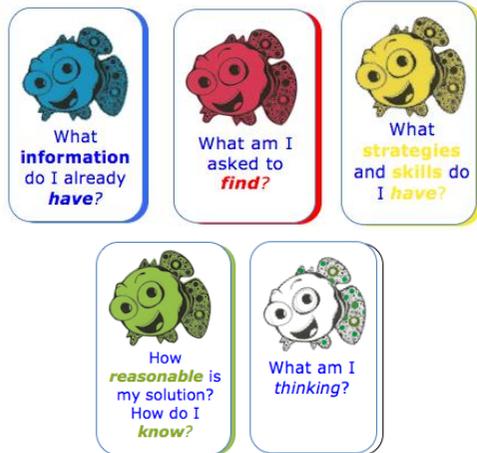
PLACE VALUE AND DECIMALS									
ten thousands	thousands	hundreds	tens	ones	and	tenths	hundredths	thousandths	ten-thousandths
				3	.	2	5		
		1	4	5	.	1	0	6	8
			2	4	.	0	7	9	

Ask learners to create a column graph in their learning journal. Draw 4,7,2,0,6 out of a hat and ask students to record the smallest number possible with 6 tenths in it. Discuss the choices learners make and the strategies they employ. Change the numbers in the hat and the criteria often

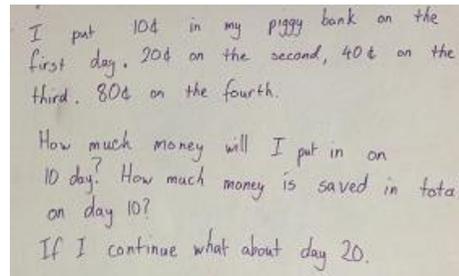
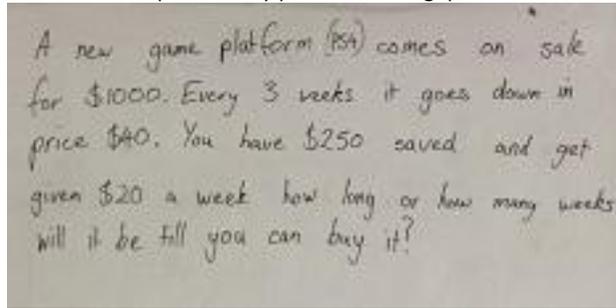
### Extensions and Variations

-Word Problems.

Differentiate the type of word problems and level of scaffolding to meet learners' needs. Include calculators, and initially only have one type of operation as the focus in each question. Use the FISH problem Solving process and strategies to understand the problem.



### Examples of daily problem solving questions



### Extensions and Variations -Picasso and Place Value

Display the 'Three Musicians' painting at the MOMA site [http://www.moma.org/collection/object.php?object\\_id=78630](http://www.moma.org/collection/object.php?object_id=78630)

Ask learners to work in groups to identify geometric shapes within the painting. Create a running list on the board of all of the geometric shapes that the students discover. Remind students these are flat shapes. (Circles Triangles Squares and Rectangles)

Ask the groups to count the circles that they see in the painting (approximately 27). If each circle were to represent 100, what is the value of the total number of circles in the painting? (approximate 2,700) Groups suggest answer

Ask students to count the COMPLETE triangles in the painting. (approximately 9) If each triangle is worth 10,000, what is the value of the total number of COMPLETE triangles in the painting? (approximately 90,000)

If we were to add the values of the circles and the triangles together, how much would the painting be worth? (approximately 92,700) Students should write the expanded notation of this value on their white boards.  $(90,000 + 2,000 + 700)$ .

The real value is estimated at \$21000000. What do the zeros tell us about the number?

What if the painting had 7 rectangles worth one, 9 squares worth 10 each, 6 circles worth 1,000 each, what would be the numerical value of the painting?  $(6,097)$  Let's write that number in expanded notation on our white boards.  $(6,000 + 90 + 7)$

If the painting had 15 squares worth 10 each, 4 circles worth 1,000 each, and 5 triangles worth 10,000 each, what would the numerical value of the painting be?  $(54,150)$  Let's write that number in expanded notation in our learning journals.  $(50,000 + 4,000 + 100 + 50)$

Students will create a piece of artwork **in the style of Picasso that emphasizes the use of geometric shapes.** (Refer to list of flat shapes students initially discovered.

Shapes used will be given a numerical value:

Circles = 1

Squares = 10

Triangles = 100

Rectangles = 1,000

Pentagon = 10,000

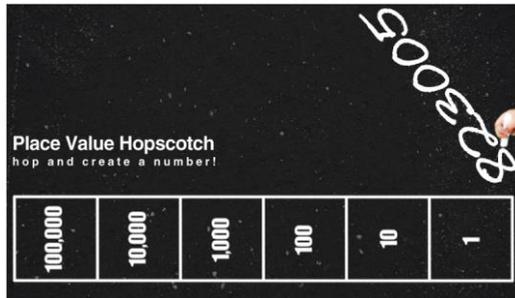
Students will create their piece of art and determine the numerical value of their composition. Students must incorporate the standard form of the value and the expanded notation on card to be displayed with their artwork (Student answers will vary depending on the number they chose to represent).

This activity has been adapted from a unit of work by Beth Goldscher and Joy Bishop 'Picasso and Place Value' available through the Curriki website.

**Digital Resources**

Hopscotch Game

<http://eisforexplore.blogspot.com.au/2013/07/place-value-hopscotch.html>



Place Value slider

<http://eisforexplore.blogspot.com.au/2013/03/place-value-slider.html>

Place Value Musical Chairs

<http://eisforexplore.blogspot.com.au/2012/06/place-value-musical-chairs.html>

**Assessment:** Tasks with high quality observational potential. A number of activities in this MAG are ideal for teacher observation. While teachers typically observe learners at work and interact with them, it is recommended that teachers in this instance nominate a particular observation emphasis.

Teachers could elect to focus on a preselected group of learners and one aspect for observation. Teachers would need to develop an observation sheet for consistency.

Assessment foci could include:

Nature and quality of written work	
Mathematical skills	
Explanation of mathematical thinking	
Use of generalisation	
Use of problem solving strategies	
Organisation	
Interaction with others	
Use of time	
Engagement	
Persistence	
Confidence	
Other	

Games such as Number Chains can be used to consolidate place value understanding and provide an opportunity for teacher observation.

Teachers should initially model **Level 1** of the game as a whole class demonstration. Using the 'Who has, I have strategy'. The number chain card, which starts the game has a light bulb icon.



After playing a few times to develop familiarity. Ask each student to create a clue card and the 'I have answer', based on the ones they have used. They are required to use their constructive and creative thinking to create mathematical clues (focus on language) and provide a logical sequence between the two cards. Teacher could unpack examples in the small example pack provided.

**Level 2**

Teachers initially model the **level 2** of the game as a whole class demonstration (this can be done on an interactive whiteboard). Randomly select five of the number chain card numbers and ask learners to create the largest number they can in standard form. Using the same numbers ask them to create the smallest number. Ask learners to add 28 hundredths to the smallest number. Ask learners to write both the smallest and largest number in word form.

**Word Wall**

Place value, smallest, largest, value, multiplication, division, geometric shapes, flat, Picasso.

**Background**

Knowledge of Place Value is essential for understanding numbers. Learners need to continually build on their understanding of the way numbers are represented and used in the everyday world. Ask learners to become place value detectives and gather examples to share with the class.

**Links to other MAGs**

Year 4 Place Value-Whole Numbers 4.1