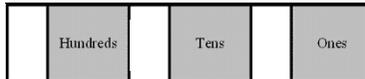# Place Value–1 2.1.3

Introduction
Students will partition numbers into standard place value partitions of hundreds, tens and ones.

Resources
- Tiny ones, tens and hundreds set
- Numeral expander
- Place Value arrows
- Early Years FISH Kit

Time / Classroom Organisation
This activity may be introduced in a small or whole group format. Allow 20---30 minutes. MAGs 1.1.3 and 1.3.4 are pre---requisites to this activity. Repeat often using different materials and allowing students to represent their understandings that a digit has both a face and place value that is determined by its position within the whole numeral in a variety of ways. Increase the numbers as students are ready.

Australian Curriculum
Year level: Two
Group, partition and rearrange collections up to 1000 in hundreds, tens and ones to facilitate more efficient counting (ACMNA028)

Word Wall: *hundreds, tens, ones, place value, expander, column, frames, numeral, position, face value, digit, number, numerals, total dice, same as, greater than, less than,*
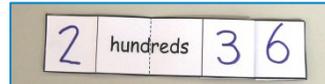
Activity Process – Place value chart

1. Choose a three-digit number, for example: 236. Ask students to write the number on their own numeral expander.
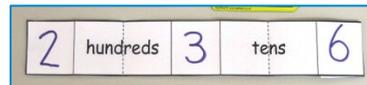
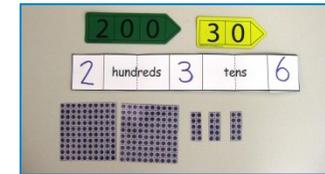2. Read the number. Open the hundreds column. Ask: *How many hundreds?* (2.)

3. Ask the students to find 2 tiny hundreds frames. Place the digit that shows how many hundreds. Find the Place value arrow to show the number of dots in the frames
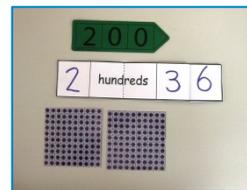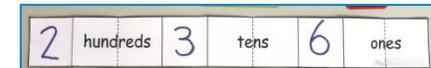
4. Open the tens column of the numeral expander. Ask: *How many tens?* (3).

5. Ask the students to find 4 tiny tens frames. Place the digit which shows how many tens. Find the Place value arrow to show the number of dots in the frames.

6. Open the ones column of the numeral expander. Ask: *How many ones?* (6)

7. Ask the students to find a 6 in the tiny ones frames. Place the digit that shows how many ones. Find the place value arrow to show the number of dots in the frame.
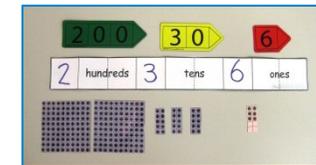
8. Place the place value arrow together to rebuild the number. Ask: *Does this match our number on the numeral expander?*

9. Repeat activity process using a different three-digit number.
   Source for Tiny hundreds tens and ones: E deVries

Strategies for asking mathematically meaningful questions focus on the big ideas of mathematics' or curricula goals and foster effective follow---up discussion for all learners. Using a model that shows 'difference' assists learners to understand the big idea that patterns in the place value system can make it easier to interpret and operate with numbers

Variations and Extensions

1. Place Value Number Board
Resources: Place value number board and counters
Roll the hundreds, tens and ones place value dice, and place a transparent counter on each of the numbers. Find the same numbers using the place value arrows, and bring the number arrows together to see how the number is written/recorded. Discuss zero as a "place holder".
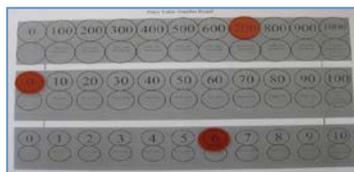
2. Different Representations
Resources: Numeral Expander and place value arrows
Write a list of the different ways that the number can be represented:
236; two hundred and thirty-six; 236 ones; 23 tens and 6 ones; 200+30+6.

3. Out of the box
Resources: whiteboards; bundling sticks; tiny hundreds tens and ones; place value arrows, numeral expanders.
One student selects a number between 100 and 200 and tells the class. Each pair of students should have enough concrete materials in front of them to represent that number. Ask students to build the number using materials, and then represent the number using symbols on their whiteboard, and then write as hundreds, tens and ones.
Source: Linthorne, C. & Serenc, M. 2005. *Jigsaw Maths Teacher Resource Book 2.* Firefly Press: Buderim. P30

Year three NAPLAN Numeracy links
2008 Question 21 - Applies place value knowledge to compare numbers
2010 Question 5 – Recognises a standard expansion of a 3-digit number.

Interactive Whiteboard Resources

Represent a given number using arrow cards
http://www.crickweb.co.uk/ks2numeracy-tools.html#Toolkit-index2a

http://www.ictgames.com/arrowCards_revised_v4.html

http://www.ictgames.com/arrowcards.html
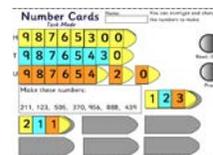
Contexts for learning
Play:
•Who Has? Hundreds Tens and Ones

I have 325
Who has 1 hundred, 5 tens, 4 ones?

•Ask students to make a set of snap or concentration cards showing different representations of the same number. For example:
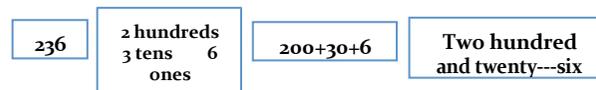
236	2 hundreds 3 tens 6 ones	200+30+6	Two hundred and twenty---six

Source: *First steps in Mathematics – Number: Whole and Decimal Numbers/Fractional Numbers,* 2010. Rigby: Port Melbourne. P60.

Investigation:
Trace around your hand onto a large piece of paper. Make five different three-digit numbers from the following digits: 8, 5,3,4,1. Record one number on each finger from the least to the most value.
Source: Source: Andrea Hillbrick, 2005. *Tuning In with Task Cards.* Curriculum Corporation: Carlton South, Vic p 41

Real life experience:
Hold Teddy's Umbrella: Use a little teddy bear holding a cocktail umbrella and write the mnemonic *Hold Teddy's **U**mbrella*. It supports students in thinking about the HTU and the order in which they are placed.

Routines and Transitions:
School days count: Each day a student adds one straw or craft stick to the ones pocket. The student holds up each straw in the ones pocket and leads the class in an oral count. The student and class decide if they have enough straws to make a bundle (of ten) to move to the tens place. Students will quickly begin to make predictions that "tomorrow is a bundle day" or "Friday will be a bundle day." After leading the class in an oral count of straws in all pockets, the student makes the change in the posted number so that it reflects how many days they have been in school and how many straws they have collected in the school day count pockets.
http://www.mathwire.com/routines/schooldaycount.pdf

Assessment
- *Apply an understanding of place value and the role of zero to read, write and order three digit numbers*
- *Make the smallest and largest number from three digits (U) (F)*
- *Write and solve simple everyday problems with three digit numbers choosing an appropriate strategy ®*
- *Different representations* in variations and extensions could be used as an assessment item.
- *Newspaper numbers* – Provide the students with a range of magazine and catalogues. Ask them to cut out all the numbers they can find and paste them in order from smallest to largest on a piece of paper. Observe if students have correct ordering of one to three digit numbers including bridging hundreds.

Source: Downton, Knight, Clarke, Lewis. 2006. *Mathematics Assessment for Learning: Rich Tasks & Work Samples.* ACU: Fitzroy. P 20.

Background Reading
Students' understanding of *Place Value* is dependant on them being able to think flexibly of numbers as being composed of other numbers. The idea is that we organise or group collections in various ways to make it easier to see how many there are. Groupings based on tens is the standard way to do this because we have chosen to build grouping of ten into the way we write numbers.

Students should develop the idea that the way we write numbers makes it easy to count forwards and backwards in tens, hundreds, and so on, as well as from any number. For example, counting forwards in tens from 17 e.g. 17,27,37 is easy if you think about what must happen in the tens place rather than trying to add 10 each time. Students can develop a sense of how the tens shift along through activities such as skip counting along a number line, or dropping vertically down the tens on a hundreds board; or adding a ten frame to a collection.
Place value makes it easy to split a number into parts. There are standard place-value partitions, such as 582=500+80+2, but often non-standard partitions are more helpful. For example, thinking of 582 as 382+200 helps us subtract 198.
Source: *First steps in Mathematics – Number: Whole and Decimal Numbers/Fractional Numbers,* 2010. Rigby: Port Melbourne. P60.

Links to other MAG's
1.3.4 Place Value chart
1.3.5 Place Value - Renaming
2.2.3 Place Value -2