Catholic Education Services
Diocese of Cairns
Learning with Faith and Vision

Tenths & Hundredths (ACMNA079) MAG 4.4.3

Draft-This is a work in progress. MAG Writing Project 2013

Australian Curriculum YR 4

ACMNA079 Recognise that the place value system can be expanded to tenths and hundredths, and make connections between fractions and decimal notation

- **Recognise** and apply decimal notation to express whole numbers, tenths, and hundredths, as decimals
- Investigate equivalences using various methods e.g. a calculator
- Identify and interpret the everyday use of fractions and decimals such as those in advertisements
- State the place value of digits in decimal numbers of up to two decimal places
- Use place value to partition decimals of up to two decimal places

Key Idea-

Partitioning of whole numbers can be represented in various forms including fractions and decimal notation. Students need to be able to represent mixed numbers in various forms and show connections between fractions and decimal notation. Students must have a basic command of addition, subtraction, multiplication, and division facts to work with fractions. To find equivalent fractions students will need to understand how to multiply or divide.

Resources

- FISH problem solving kit
- IWB and Internet Access
- Place Value Charts
- Hundreds Charts
- Blank Conversion Charts
- Large Fractions/Decimals Laminated Cards
- Deck of Cards
- Calculators
- Recipes
- Junk Catalogues e.g. Spotlight

Introductory Activity Process

1. Discuss learners' prior knowledge of fraction, decimals and parts of whole numbers.

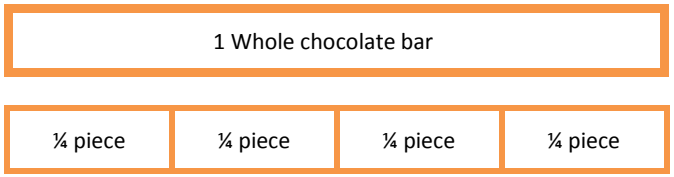
2. Ask learners to brainstorm and list ways they know how to model/represent fractions.

3. Introduce and/or revise the term 'Numerator' and 'Denominator'. The top number of the fraction is called the **numerator** and it represents how many parts out of the whole. The **denominator** is the name for the bottom number and it represents how many parts there are to the whole unit.

1 (Numerator)
-- = 1 / 2 = 0.5
2 (Denominator)

Discuss a problem example with the class. eg. There are 4 friends that want to share a chocolate bar equally. The chocolate bar is the whole and the 4 friends represent how many parts the bar will be split into equally.

4. Represent the above scenario using a diagram



Each friend will receive 1/4 of the chocolate bar.
The answer can be stated as:

- one fourth/quarter
- one out of four
- one divided by four

Discuss other ways this problem could be visually represented.

5. Explain that fractions and decimals are equivalent (have the same value) and give examples such as

A quarter is worth twenty-five cents or 0.25. This is a quarter of a dollar. Therefore, 0.25 is equal to 1/4. When a fraction is converted to a decimal or vice versa the two values are equal.

6. Revise place value to tenths and hundredths (using a place value chart) and explain that to the right of the decimal point means part of one whole. Investigate how one hundredth is smaller than one tenth.

7. Explain to the students the concept that the line between the numerator and the denominator means divide. ¼ or one divided by four is 0.25. Dividing is how we find the equivalent decimal. Always divide the numerator by the denominator.

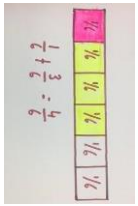
8. Give students a list of fractions to convert into decimals notation using their calculators. Explain that they are finding the ***equivalent.***

9. Explain to students that we can also find equivalent fractions by multiplying or dividing the numerator and denominator by the same number. Students can visualise, investigate and prove this concept by creating an equivalent fraction chart.

10. Instruct students to colour in equivalent decimals and fraction using a chart or strips. For decimals to fraction relationships involving hundredths, like 72/100 and 0.72, use a hundreds grid to shade in the numbers. A number line is also helpful for allowing students to see the size of both decimals and fractions.

11. Discuss the relevance or importance of this concept. Begin with starter questions. E.g. Where do we see fractions and decimal notation in our society? Why are fractions and decimals important? What do we use fractions and decimals for?

12. Extend students learning to adding and subtracting decimals and fractions. Students can visually show an addition or subtraction problem for fractions. e.g. 1/4 + 3/6 = 4/6



- Students can visually show decimal addition and subtraction using a hundreds chart e.g. 0.52 + 0.16 = 0.78

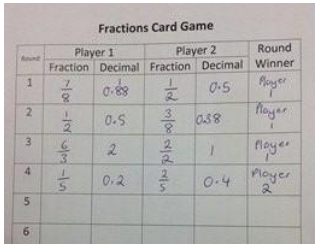
Extensions and Variations

Explain that another way to convert a fraction to a decimal is to first change the fraction into a basic equivalent fraction. For instance, 4/5 can be multiplied on both the top and bottom by two to equal 8/10. 8/10 is equal to 0.8. Give students a series of similar questions.

Game for two players:

Remove picture cards and shuffle remaining cards. Place them face down in a pile. Each player takes a turn to draw 2 cards and create a fraction. The player then uses their calculator to divide their fraction into a decimal. The player who makes the largest decimal is the winner for that round. The player who wins the most rounds out of ten is the winner.

(Students may work out that if the larger drawn number is placed as the numerator, their answer will be a mixed number and will have the largest answer)



Fractions Card Game

Round	Player 1		Player 2		Round Winner
	Fraction	Decimal	Fraction	Decimal	
1	7/8	0.88	1/2	0.5	Player 1
2	1/2	0.5	3/8	0.38	Player 1
3	6/3	2	2/2	1	Player 1
4	1/5	0.2	2/5	0.4	Player 2
5					
6					

Sample Games Sheet

Write various decimals and fractions in large print on large cards and laminate. Put them in groups and see how fast students can organise them from least to greatest or vice versa. (You can have a pile of fractions and a separate pile of decimals or for a bigger challenge mix them together).

Digital Learning

- Whiteboard Interactive sources:

www.topmarks.co.uk/interactive.aspx?cat=24

Various fraction resources e.g.-What Fraction?, Fraction Flag, Fraction Bar- Equivalent, Fraction Finder

- .mathplayground.com

Escape from Fraction Manor

- Primaryresources.co.uk

- Fractions, Decimals, Mixed PDF Resources

- math-drills.com.

-Decimal place value charts, Conversion charts, PDF Worksheets

Context for Learning

Real life experiences:

Find a recipe that involves fractions (1/2 cup,, ¼ cup, etc.) and explain that the students need to double the recipe to make enough for a class party. Students need to convert the current amount to the required amount using multiplication.

The students can also explore the price or amount needed of material from a shop such as 'Spotlight' How much would ½ metre cost at $6.50 per metre.

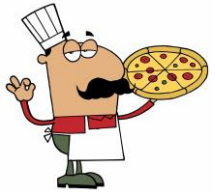
The students can also work out the original price of an item. For example: linen costs $8 at ½ price. What was its original price?

Investigation:

Albert, Bess and Charlie share two identical pizzas between them. Albert has 3/5 of the first pizza and gives the rest to Charlie. Bess has 2/3 of the second pizza and gives the rest to Charlie.

(a) Who has most pizza? Explain how you get your answer.

(b) Who has least? Explain your answer.



Assessment

- Uses appropriate terminology to describe, and symbols to represent, mathematical ideas
- Checks the accuracy of a statement and explains the reasoning used
- Represent, model and compares commonly used fractions and decimals
- Conversion calculations of fractions to decimals
- Completion and accuracy of Equivalent Fractions Conversion Chart.
- Answers to problem solving tasks using FISH

Background

Fractions are used in different ways to describe equal parts of a whole. Money is the application of decimals to two decimal places.

Some learners have trouble explaining what the numerator and denominator actually represent in a fraction. They need to explore fractions informally without any rules at first, to encourage the development of their own concepts and ideas. Counting fractional parts help children develop a complete generalised system for naming fractions before they learn about fraction symbolism. When learners have an understanding of decimal place value they can convert decimals into fractions.

Links to other MAGs

Part Whole 4.4.2