

Beginning Term 2, 2010	Maths	Number: Understand Operations	Class: Middle Primary
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This document assumes that relevant diagnostic tasks for Understand Operations have been completed. Judgements can then be made on the appropriate activities to select below, as these aim to assist teachers in helping students to consolidate and develop new understandings.

You are strongly encouraged to read the background notes from page 87 – 94 in Book 2 of First Steps, as they help classify problems, as well as representations of problems.

### Curriculum Framework Outcomes

7. Understand Operations: students understand the meaning, use and connections between addition, multiplication, subtraction and division.

<b>Key Understanding 1</b> Adding and subtracting numbers are useful when we: <ul style="list-style-type: none"> <li>• change a quantity by adding more or taking some away</li> <li>• think of a quantity as combined parts</li> <li>• equalise or compare two quantities</li> </ul> <b>Handy Hint:</b> <i>"This KU is about the <b>meaning</b> of addition and subtraction operations, RATHER THAN how to carry out the calculation". Pg12 FSIM</i>		Relevant ANTT Tasks (to be filled in)	
Mathematical Focus	Activities / Tasks	Focus Questions	AEW Involvement
<p>Understand how and why addition and subtraction is used in different situations including: Change, Combine, Compare and Equalise</p> <p>Use diagrams to show how addition and subtraction relates to a situation.</p>	<p>Story Problems FS p16</p> <ul style="list-style-type: none"> <li>- Keep the story context but change the situation</li> <li>- Change the numbers</li> <li>- Keep the numbers but change the story</li> </ul> <p>Comparing in the Classroom FS p16</p> <p>Similar story problems and have students represent them with pictures and diagrams. Classify them into addition or subtraction. Encourage representations of part-whole diagrams by scaffolding the labelling.</p>	<p>What is happening in the story? How did you work that out? Can you write a number sentence to match the story?</p> <p>Can you draw a picture / diagram to show what is happening? What does each part of the diagram show? Can you write a number sentence to match? Which parts of the picture relate to which parts of the number sentence?</p>	<p><b>Some</b> possible roles and responsibilities AEWs for all these tasks can take include:</p> <ul style="list-style-type: none"> <li>- running part of a lesson</li> <li>- working with a group</li> <li>- working with a particular student</li> <li>- running a game</li> <li>- acting as a translator</li> <li>- preparing resources</li> <li>- asking focus questions</li> <li>- assessing students</li> </ul>



<p><b>Key Understanding 2</b> Partitioning numbers into part-part-whole helps us relate addition and subtraction and understand their properties.</p>		<p>Relevant ANTT Tasks (to be filled in)</p>	
Mathematical Focus	Activities / Tasks	Focus Questions	AEW Involvement
<p>Partitioning numbers into part-part-whole helps us relate addition and subtraction and understand their properties.</p> <p><b>Cover the following situations throughout this Key Understanding</b></p> <p>Whole quantity unknown – addition and commutative (doesn't matter which order)</p> <p>One of the other quantities is unknown – subtraction and not commutative (order is vital) or open addition.</p>	<p>The following activities can be done using from the previous Key Understanding stories (can change numbers if you'd like).</p> <ul style="list-style-type: none"> <li>- Which operation? FS p25</li> <li>- Unknown Number FS p25</li> </ul> <p>Develop number sentences both as it is presented in the story (eg. <math>17 + ? = 25</math>) and as it can be solved (<math>25 - 17 = ?</math>)</p> <p>Using Real Data / Attachment A</p> <p>Extend students to use real data (eg the attached list of West Coast / Fremantle AFL Games played) to compare using the part-part-whole model. You / they can create number stories (and sentences) such as:</p> <ul style="list-style-type: none"> <li>- How many more games has Matthew Pavlich played than Aaron Sandilands?</li> <li>- Which Eagle player, if he grew 14cm, would be the same height as Dean Cox?</li> </ul> <p>What number am I? eg When you add 122 to me, I become 187 Number sentence is: <math>187 - 122 = 65</math> eg. I spent \$15, and now only had \$37 left</p> <p>Open question: same but only have one out of three quantities known. eg. How many years until Lisa turns 18?</p>	<p>What do you know? Do you know the whole? The parts? What part don't you know? How can we solve this? Can we use addition? Subtraction? Which one can we use on a calculator?</p> <p>Is there a diagram we can use to compare the two footballers? What are the addition / subtraction number sentences you can use to show this? What are the different number sentences you could use to compare the two players? What does this number sentence tell us about the players?</p> <p>What are all the possibilities? How can you organise your results? What number sentences can you attach to each result?</p>	

<p>Using the inverse relationship between addition and subtraction to solve algebraic problems</p>	<p>Number Charts: Maths 300 / Attachment B Focus on addition charts but have students think about what is needed to make it to the numbers (addition becomes subtraction).</p>	<p>As per lesson plan</p>	
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<p>(Can use this to look at the commutative property of multiplication – eg. <math>3 \times 5</math> gives the same answer as <math>5 \times 3</math>)</p> <p>Using multiplication for combinations</p>	<p>between arrays and multiplication</p> <p>Story contexts could include tiling (see lesson plan attached – Attachment E), chocolate blocks, windows on a skyscraper and car parks (probably need to bring in photos of the last two).</p> <p>Note: this could be a good opportunity for a measurement investigation into creating the formula for the area of a rectangle.</p> <p>At McDonalds / Other Take Away, you can choose one of each of the following (can limit to two groups if appropriate):  Burger – Big Mac, Cheese Burger, McChicken  Side – Fries, Salad,  Drink – Diet Coke, Juice, Water  Or Interschool Sports – choose one event from running, throwing and jumping categories.</p>	<p>If we had 48 __ (eg. squares of chocolate) what are the possible number of rows and columns?</p> <p>How can you show the area on the grid paper?  Where are the __ groups of __? What could <math>4 \times 9</math> show the area of?</p> <p>How many choices are there for burgers? Could we have these as our starting groups? What sides can you have for each burger? Could you have fries with a Big Mac and a Cheeseburger? Are these different combinations? How many combinations so far? How many for each burger choice? How many burger choices are there? So we've got 3 burgers, each with 2 sides. (<math>3 \times 2 = 6</math>) What about the drinks?</p>	
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**Some useful resources:**

Maths 300: <http://www.maths300.esa.edu.au/>  
Your school should have its own username and password

Word Problems For Kids: <http://www.mystfx.ca/special/mathproblems/>  
Canadian Website with worded problems (many numbers would need to be amended but it does give some good ideas for stories / contexts)