Year 2	Western Adelaide Region - Maths Assessment Tasks Map *(Draft –November 2013)*						Proficiency Strands
Aims	**The Australian Curriculum Mathematics aims to ensure that students**……are confident, creative users and communicators of mathematics, able to investigate, represent and interpret situations in their personal and work lives and as active citizens; develop an increasingly sophisticated understanding of mathematical concepts and fluency with processes, and are able to pose and solve problems and reason in *Number and Algebra, Measurement and Geometry, and Statistics and Probability*; recognise connections between the areas of mathematics and other disciplines and appreciate mathematics as an accessible and enjoyable discipline to study.						• Understanding • Fluency • Problem Solving • Reasoning
Content Strands	**Number & Algebra**						
Sub Strands	**Number & Place Value**				**Fractions and Decimals**	**Money and Financial Mathematics**	**Patterns & Algebra**
Big Idea / Concept/ Key Understanding	Trusting the Count	Place Value	Additive to Multiplicative Thinking		Partitioning	-Currency has determined values and can be recognised according to appearance and value -The size of Australian coins and notes does not determine its value -Money values can be represented in a variety of combinations -Each country has its own currency -Currency provides access to food and services	-A pattern requires an element of repetition that can be described with a pattern rule -Patterns can be represented in many ways, including using combinations of numbers, objects and symbols -Patterns are all around us
	-Numbers are said in a particular order and there are patterns in the way we say them -There are many ways to represent numbers -Numbers tell how much or how many	-Numbers can be renamed in various ways *(i.e. 254 can be renamed as 25 tens and 4 ones, or 254 ones)* -In place value there are names for each new unit (multiples of 10) *(i.e. tens, hundreds, thousands)*	-There are many different ways to represent numbers, and to add, subtract , divide and multiply numbers -There are strategies that help with addition and subtraction *(e.g. commutative properties)* -Fluency with number facts is essential for developing and applying efficient mental strategies	-Multiplication can be equated to repeated addition and repeating patterns -Division is the inverse operation of multiplication. It also means to make groups of -It is important to recognise each operation and its appropriate use -Exploring generalisations develops number knowledge *(e.g. for 3 fours "I know that 4 doubled is 8, so 1 more 4 is 12")*	-The number of parts names the part *(i.e. 3 parts- thirds, 5 parts- fifths)* -As the number of parts increases, the size of the parts decreases *(i.e. although in number we know 5 is larger than 3, in fractions fifths are smaller than thirds)* -Fractions have equal parts -Language is important *(i.e. "I have 1 out of 2 apples, I have half" – how many out of how much; the time is half past 1)*		
Australian Curriculum Content Descriptor	Investigate number sequences, initially those increasing and decreasing by twos, threes, fives and ten from any starting point, then moving to other sequences	Recognise, model, represent and order numbers to at least 1000 Group, partition and rearrange collections up to 1000 in hundreds, tens and ones to facilitate more efficient counting	Explore the connection between addition and subtraction Solve simple addition and subtraction problems using a range of efficient mental and written strategies	Recognise and represent multiplication as repeated addition, groups and arrays Recognise and represent division as grouping into equal sets and solve simple problems using these representations	Recognise and interpret common uses of halves, quarters and eighths of shapes and collections	Count and order small collections of Australian coins and notes according to their value	Describe patterns with numbers and identify missing elements Solve problems by using number sentences for addition or subtraction
Achievement Standard	Students **recognise increasing and decreasing number sequences** involving 2s, 3s and 5s.	Students **count to and from 1000**	Students **perform simple addition and subtraction calculations** using a range of strategies	Students **represent multiplication and division** by grouping into sets	Students **divide collections and shapes into halves, quarters and eighths**	Students **associate collections of Australian coins with their value**	Students **identify the missing element in a number sequence**
Summative Assessment Task	**2.1** Code Breaker		**2.2** Monopoly	**2.3** Chocolate Chip Biscuits	**2.4** Who Wants Smarties?		

Developed by Karly Hefferan, Chris Miethke, Susan Glaister, Karen Knox, Lauren Fletcher-Rees & Dawn Dyer

2.1 - Number & Place Value

Counting in number sequences using skip counting

Western Adelaide Region

Mathematics Performance Assessment Tasks *(Updated: November 2013)*

Year 2

Big Idea(s)

-Numbers are said in a particular order and there are patterns in the way we say them.

-There are many ways to represent numbers.

Australian Curriculum Content Descriptor

Investigate number sequences, initially those increasing and decreasing by twos, threes, fives and ten from any starting point, then moving to other sequences.

Achievement Standard

By the end of Year 2, students recognise increasing and decreasing number sequences involving 2s, 3s and 5s.

Related Mathematical Proficiencies

- *Understanding* includes connecting number calculations with counting sequences
- *Fluency* includes counting numbers in sequences readily

Prior Learning Experiences

Do I use ongoing Formative Assessment to inform the teaching & learning cycle? Do I provide learning experiences that enable students to build on their knowledge?

It is important that students have had experiences with the learning opportunities below before administrating the assessment task.

Developing:

Understanding Fluency Problem Solving Reasoning

Through experiences with:

- Increasing/decreasing 1-100 and 0-99 charts
- Pattern and Sequencing tasks from primaryresources.co.uk
- Open number lines
- Visual patterns to sequence and explain using a range of materials
- 2s, 3s, 5s and 10s card sets that allow students to explain which pattern sequence they see
- Using calculators to predict sequences of numbers
- Exploring patterns from different starting points
- Counting games, forwards and backwards
- Missing number tasks
- Barrier games involving description of a pattern to a partner and they recreate the pattern
- Topmarks.co.uk

Feedback

How will I provide feedback to students?

Teacher observations

Conferences 1:1 with peers & teacher

Learning log: Student identifies areas for focus

SNW (S- strengths, N – needing improvement, W- where to next)

Stars/ smiley faces/ traffic lights

Summative Assessment

*Does the assessment task indicate **how well** students understand and can apply their learning? (**how well** = extent, depth and sophistication of thinking – informs A-E grading)*

Code Breaker *(see attachment 2.1)*

Entry Level

The number chains are counting forwards or backwards in 2s, 3s or 5s. Fill in the missing numbers and record the pattern in the code button.

Challenge Level

Students create their own forwards or backwards number sequences using a code other than 2s, 3s, 5s or 10s. They give their teacher the number chain and challenge them to crack the code.

Students can create more of their own codes on the back of their page.

Questioning *– "How did you know if your code was counting by 2s, 3s or 5s?" "What would the next number be if the chain kept counting?" "Tell me about the pattern of 2s, 3s and 5s. How did you know it was increasing/ decreasing?" "Where else have you seen a pattern like this?" "What other number patterns do you know?"*

Organisation

Teacher – Attachment 2.1

Students –Attachment 2.1, pencil

Evidence

What evidence am I looking for that demonstrates the student has got it?

Students will:

- **Demonstrate** knowledge by recognising and talking about the number sequences involving 2s, 3s and 5s.
- **Show** understanding by accurately sequencing numbers from any starting point and being able to explain whether it is increasing or decreasing and by how many.

Advanced –Students demonstrate an understanding of increasing and decreasing number sequences from any starting point, involving numbers 2s, 3s, 5s initially and 10s and then numbers other than 2, 3, 5 and 10. They are able to explain their own number sequence using mathematical language.

Competent – Students demonstrate an understanding of the task by recognising increasing and decreasing number sequences, moving from any starting point, involving 2s, 3s and 5s. They are able to explain their sequence using mathematical language.

Developing– Students demonstrate some/little understanding and are unable to recognise increasing or decreasing number sequences. They attempt to complete the number sequences.

2.2 -Number & Place Value

Represent and solve simple addition and subtraction

Western Adelaide Region

Mathematics Performance Assessment Tasks *(Updated: November 2013)*

Year 2

Big Idea(s)

-There are many different ways to represent numbers, and to add, subtract, divide and multiply numbers.
-Fluency with number facts is essential for developing and applying efficient mental strategies.

Australian Curriculum Content Descriptor

Explore the connection between addition and subtraction.
Solve simple addition and subtraction problems using a range of efficient mental and written strategies.

Achievement Standard

By the end of Year 2, students perform simple addition and subtraction calculations using a range of strategies.

Related Mathematical Proficiencies

- *Understanding* includes identifying and describing the relationship between addition and subtraction
- *Problem Solving* includes making models and using number sentences that represent problem situations

Prior Learning Experiences

Do I use ongoing Formative Assessment to inform the teaching & learning cycle? Do I provide learning experiences that enable students to build on their knowledge?

It is important that students have had experiences with the learning opportunities below before administrating the assessment task.

Developing:

Understanding Fluency Problem Solving Reasoning

Through experiences with:

- Doubles, near doubles, turn around facts, friendly numbers, bridging through 10, open number line– *Natural Maths* (Ann & Johnny Baker)
- Mental routines using 1-100 chart
- Problematised Situations, using a real-world narrative – Natural Maths (Problem Solving book Level 2)
- Wrapping paper (efficient counting) – e.g. Could we find out how many lollies there are? How could we count them? Which lolly is the most popular? *(Set the scene by narrating it- "The manufacturer had heard that jellybeans were the most popular lolly. They want to know…")*
- Dice games – roll 2/3/4 dice; How many altogether? How do you know? Could you count in a different way?
- Open number lines for basic addition and bridging through 10
- Hidden numbers – early algebraic thinking (The answer is… What might the numbers be? Could there be 3 numbers?)
- Thinkboards – worded problem
- Part-part whole – 16 is…(6 and 10, , 20 take 4, double 8)
- Cuisenaire rods – part-part whole and doubles
- Use number cards to show me…:

- Two numbers with a total of…
- Two numbers with a difference of…

(Ask students to explain their methods)

- Revise fact families (2+3=5, 3+2= 5, 5-3=2, 5-2=3)
- Ten frames and subitising cards 2 and 3 collections *(see Professor Dianne Siemon)*
- Number stories and counting stories
- I have, who has cards
- Johnny Ball mathematics books *(e.g. 'Think of a Number')*

Feedback

How will I provide feedback to students?

Teacher observations

Conferences 1:1 with peers & teacher

Learning log: Student identifies areas for focus

SNW (S- strengths, N – needing improvement, W- where to next)

Stars/ smiley faces/ traffic lights

Summative Assessment

*Does the assessment task indicate **how well** students understand and can apply their learning? (**how well** = extent, depth and sophistication of thinking – informs A-E grading)*

Monopoly *(see attachment 2.2- optional)*

Adapted from Natural Maths Problem Solving- Ann & Johnny Baker

***This task could also be used in conjunction with a unit on money**

Entry Level

Ms Lauren was planning to play a special Monopoly game she made for her students. She told the students that they would need to find out how much money they had before they could start.
Tom said "I have five notes that total $45. I have four $10 notes." What might his other note be?
Lisa said "I have $45 too, but I have five notes and some of them are $5 notes." What might Lisa's other notes be?
Jenny said "I have $55. I have notes are of three different colours." What could Jenny's notes be?

Challenge Level

How much money would there be if you put Tom's, Lisa's and Jenny's money together? What combinations of notes might you have? Record your combinations and your thinking.

Questioning *– "How did you work out the combinations of notes for Tom/Lisa/Jenny?" "What strategies did you use?" "What prior knowledge helped you to solve the problem?" "What clues helped you the most?" "Did you do any calculations in your head before you wrote them down?"*

Organisation

Teacher – Play money available if required; copies of attachment 2.2 (optional)
Students – Attachment 2.2 or paper for recording; pencils

Evidence

What evidence am I looking for that demonstrates the student has got it?

Students will:

- **Demonstrate** knowledge by showing the connection between addition and subtraction.
- **Show** understanding by explaining which process was used and why.

Advanced – Students demonstrate an understanding of multiplicative strategies when problem solving. They use simple multiplication of 10s and 5s to calculate the total amount of each group of notes. They provide more than one possible combination for Lisa and Jenny. They record their strategies in an ordered and logical manner. They solve the challenge level question and record multiple possible combinations. They explain their thinking and the strategies used using mathematical reasoning.

Competent – Students demonstrate an understanding of efficient strategies and use addition and subtraction to calculate the possible combinations of notes. They record their thinking using additive strategies *(e.g. $10+$10+$10 +$10+$5).* They possibly use play money to assist their thinking. They explain their choices using mathematical language.

Developing–Students demonstrate some/little understanding and are only able to calculate the note combinations for Tim and possibly Lisa. They are unable to determine the money for Jenny. They require additional scaffolding and play money to participate in the task.

2.3 -Number & Place Value

Representing multiplication and division by grouping

Western Adelaide Region

Mathematics Performance Assessment Tasks *(Updated: November 2013)*

Year 2

Big Idea(s)

-Multiplication as repeated addition and repeating patterns

-Exploring generalisations develops number knowledge *(e.g. for 3 fours "I know that 4 doubled is 8, so 1 more 4 is 12")*

Australian Curriculum Content Descriptor

Recognise and represent multiplication as repeated addition, groups and arrays.

Recognise and represent division as grouping into equal sets and solve simple problems using these representations.

Achievement Standard

By the end of Year 2, students represent multiplication and division by grouping into sets.

Related Mathematical Proficiencies

- *Understanding* includes identifying and describing the relationship between multiplication and division
- *Reasoning* includes comparing and contrasting related models of operations

Prior Learning Experiences

Do I use ongoing Formative Assessment to inform the teaching & learning cycle? Do I provide learning experiences that enable students to build on their knowledge?

It is important that students have had experiences with the learning opportunities below before administrating the assessment task.

Developing:

Understanding Fluency Problem Solving Reasoning

Through experiences with:

- Exploring multiplication and division through the use of picture books (*e.g. One is a Snail, April Pulley; The Bears Picnic, Joy Crowley)*
- Exploring equal groups and fair share, leading to making arrays *(e.g. 4 groups of 3: frame as a problem solving task – on the muffin tin there are 3 rows, in each row is 4 spaces for a muffin. How would I know how many muffins it makes? Or a muffin tin makes 12 muffins, what might it look like?)*
- Mental routines involving problematised situations *(Natural Maths, Ann & Johnny Baker)*
- Dice games – one dice the multiplier, one dice how many to multiply by, cover and record on a chart
- Counting games
- Thinkboards- word problems/ 'The answer is…'
- Explore efficient counting using wrapping paper- how many (dots, guitars, cars, etc.) are there on your piece of wrapping paper? How many might there be on the whole piece of paper?
- Find real-world examples/photos of multiplicative thinking and write word problems to suit
- Practise estimation using larger numbers. Use calculators to check estimations of 'how many'
- Use students in the class to physically explore division and making equal groups *(3 groups of 4 people, then 4 groups of 3 people, 2 groups of 6, 6 groups of 2 – after each new group how many in each group? How many in total? What do you notice? Why might the total be the same but the groups look different?)*

Feedback

How will I provide feedback to students?

Teacher observations

Conferences 1:1 with peers & teacher

Learning log: Student identifies areas for focus

SNW (S-strengths, N – needing improvement, W-where to next)

Stars/ smiley faces/ traffic lights

Summative Assessment

*Does the assessment task indicate **how well** students understand and can apply their learning? (**how well** = extent, depth and sophistication of thinking – informs A-E grading)*

Chocolate Chip Biscuits *(see attachment 2.3 –optional)*

Entry Level – ***The teacher narrates and records key information on the board (e.g. 6 biscuits, 25 chocolate chips, fair share). If using the attachment students should be encouraged to highlight the key information.***

"Four friends were having a sleepover party and they wanted to bake some chocolate chip biscuits. To be fair they wanted to make sure each biscuit had the same amount of chocolate chips. When they divided their cookie dough they made 6 extra-large biscuits. The friends started to put the chocolate chips on the biscuits but when they got to the 5th biscuit they ran out! They had to take off all of the chocolate chips. One of the friends was very clever and she counted each chocolate chip as they were being taken off. She counted 25 chocolate chips. The friends didn't know how many to put on each biscuit. Do you think you could help? How many chocolate chips do you think each biscuit should have?"

Challenge Level

If they made twice as many biscuits, but only had the same amount of chocolate chips how many chips would each biscuit get?

How would they share the biscuits fairly?

Questioning *– "How did you know how many chocolate chips to put on each biscuit?" "What strategies did you use to help?" ""Have you seen a similar problem before?" "How did you work out fair share?"*

Organisation

Teacher – the teacher narrates the problem and records key information on the board, materials to represent chocolate chips for students if they need to use them

Students – paper, pencil

Evidence

What evidence am I looking for that demonstrates the student has got it?

Students will:

- **Demonstrate** knowledge by dividing/grouping a collection into equal sets.
- **Show** understanding by recording groups using arrays or groups on biscuits. Students will explain how they grouped and why using mathematical language.

Advanced –Students demonstrate an understanding of fair share by dividing chocolate chips into equal sets for their cookies using multiplicative strategies. They explain and record their thinking using efficient strategies and mathematical reasoning. Students may attempt to use fractions symbols when recording. They record how the biscuits would be shared fairly and explain their solution.

Competent –Students demonstrate an understanding of equal groups and fair share and are able to divide the chocolate chips into equal sets with the given amount of cookies. They can record and explain their thinking using mathematical strategies.

Developing–Students demonstrate some/little understanding and are unable to group into equal sets. They attempt to solve the problem however are unable to find a solution.

2.4 -Number & Place Value

Recognise and divide collections and shapes into halves, quarters, eights.

Western Adelaide Region
Mathematics Performance Assessment Tasks *(Updated: November 2013)*

Year 2

Big Idea(s)

-The number of parts names the part *(i.e. 3 parts- thirds, 5 parts- fifths).*
-As the number of parts increases, the size of the parts decreases *(i.e. although in number we know 5 is larger than 3 in fractions fifths are smaller than thirds).*
-Fractions have equal parts.
-Language is important *(i.e. "I have 1 out of 2 apples, I have half" – how many out of how much; the time is half past 1).*

Australian Curriculum Content Descriptor
Recognise and interpret common uses of halves, quarters and eighths of shapes and collections.

Achievement Standard
Students divide collections and shapes into halves, quarters and eighths.

Related Mathematical Proficiencies

- *Problem Solving* includes formulating problems from authentic situations and making models that represent problem situations

Prior Learning Experiences

Do I use ongoing Formative Assessment to inform the teaching & learning cycle? Do I provide learning experiences that enable students to build on their knowledge?

It is important that students have had experiences with the learning opportunities below before administrating the assessment task.

Developing:

Understanding Fluency Problem Solving Reasoning

Through experiences with:

- Paper folding to build up an understanding of fractions as equal parts of a whole *(P. 153 Teaching Primary Mathematics- George Booker; see also Professor Dianne Siemon's Partitioning resources and articles via the Department of Education & Early Childhood Development website).*
- Use streamers, ribbon & pegs, frieze tape, different sized paper to model the number of parts names the part, no matter the size
- Modelling and exploring halves, quarters and eighths of shapes and collections
- Order fractions according to size. *You will need to use the same sized paper or same collection to model this.*
- Paper fold to model the more the parts there are the smaller the size of the part *(i.e. halves are bigger than quarters, even though we know 4 is larger than 2)*
- Create a 'bag of fractions'- use 125mmx125mm squares to fold and cut to show a whole, halves, quarters, eights
- Identify fractions in the real world
- Sharing collections of objects into halves, quarters, eights
- Fraction I have Who has cards (sparklebox.co.uk)
- Fraction Bingo (sparklebox.co.uk)
- Problem solving using fractions (Natural Maths)
- Thinkboard- Fraction names, fraction numbers, visual of shape, materials to show collection
- Fractions posters for halves, quarters and eighths

Feedback

How will I provide feedback to students?

Teacher observations

Conferences 1:1 with peers & teacher

Learning log: Student identifies areas for focus

SNW (S- strengths, N – needing improvement, W- where to next)

Stars/ smiley faces/ traffic lights

Summative Assessment

*Does the assessment task indicate **how well** students understand and can apply their learning? (**how well** = extent, depth and sophistication of thinking – informs A-E grading)*

Who wants Smarties? *(attachment 2.4- optional)*

Entry Level ***The teacher narrates and records key information on the board. If using the attachment students should be encouraged to highlight the key information.***

Mr K was given a box of Smarties. He wanted to share them with all of the class but when he counted them he only had 16 Smarties. He asked the students how he could share them. George said that he and Yusuf should get the Smarties because they helped to clean up after the art activity. Sara said that she and Freddie should also get the Smarties with George and Yusuf as they helped to set up for the art activity. Mr K thought it was fair and was just about to share the Smarties when Joel said that his art group should get the Smarties because they had the biggest group of 8 people and they all worked the best.
How do you think Mr K should share the Smarties? Draw the three different ways the Smarties could be shared.

Challenge Level
Mr K had a bag of 32 Smarties and he said you could have one half or one quarter of them. What would you choose? Explain why you made that choice.
If you could choose any fraction what would you choose? Why?

Questioning *– "What strategies did you use?" "How did you work out how many Smarties for each person?" "What did you find challenging/ easy?" "What prior knowledge helped you?" "How do you think Mr K should share the Smarties? Why?" "How would you find half of …(10, an orange, a basketball court)?"*

Organisation
Teacher – read the problem to the students and record key information on the board (to suggest 3 different ways); copies of attachment 2.4 (optional); paper; counters available for students choosing to use them
Students –paper or attachment 2.4 (optional); pencils

Evidence

What evidence am I looking for that demonstrates the student has got it?

Students will:

- **Demonstrate** knowledge of halves, quarters and eighths of shapes and collections by recording the appropriate fractions using words and numbers.
- **Show** understanding by recognising and interpreting common uses of halves, quarters and eighths and explain their understanding of what a fraction is.

Advanced –Students demonstrate an understanding of fractions of a quantity/collection using basic common fractions. They successfully and confidently complete all tasks including the challenge task and use fractions symbols and diagrams when recording. They record and explain their thinking using mathematical language and reasoning.

Competent –Students demonstrate an understanding of the task. They complete the task accurately and record each fraction using words and numbers *(e.g. George and Yusuf get 8. Half of 16 is 8).* They explain their thinking using mathematical language and logical strategies when calculating halves, quarters and eighths.

Developing– Students demonstrate some/little understanding of the task and possibly only model sharing between two people. They are prompted to use counters to assist in problem solving.

Attachment 2.1 Code Breaker

Name:

Date:

2.1- Code Breaker

These number chains are counting backwards and forwards by 2s, 3s or 5s. Fill in the missing numbers and record the pattern in the code button.

33			42		**Code** Counting forwards by 3s
50		40			**Code**
107				115	**Code**
220	217				**Code**

Open Code – choose to count by 2s, 3's or 5's to finish the code

				158	**Code**

Challenge Level- Create your own forwards or backwards number sequence beginning with the largest number you can. Use a code other than 2s, 3s, 5s or 10s and then challenge your teacher to crack your code.

Attachment 2.2 Monopoly **Name:** **Date:**

Tom said “I have five notes that total $45 and I have four $10 notes.” What might his other note be?
Lisa said “I have $45 too, but I have five notes and some of them are $5 notes.” What might Lisa’s other notes be?
Jenny said “I have $55. I have notes of three different colours.” What could Jenny’s notes be?

Attachment 2.3 Chocolate Chip Biscuits **Name:** **Date:**

The friends were making a batch of lovely chocolate chip biscuits. To be fair they wanted to make sure each biscuit had the same amount of chocolate chips. When they divided their cookie dough they made 6 extra-large biscuits. The friends started to put the chocolate chips on the biscuits but when they got to the 5th biscuit they ran out! They had to take off all of the chocolate chips. One of the friends was very clever and she counted each chocolate chip as they were being taken off. She counted 25 chocolate chips. The friends didn't know how many to put on each biscuit. Do you think you could help? How many chocolate chips do you think each biscuit should have?"

Attachment 2.4- Who Wants Smarties? **Name:** **Date:**

George said that he and Yusuf should get the Smarties because they helped to clean up after the art activity.
Sara said that she and Freddie should also get the Smarties with George and Yusuf as they helped to set up for the art activity.
Joel said that his art group should get the Smarties because they had the biggest group of 8 people and they all worked the best.