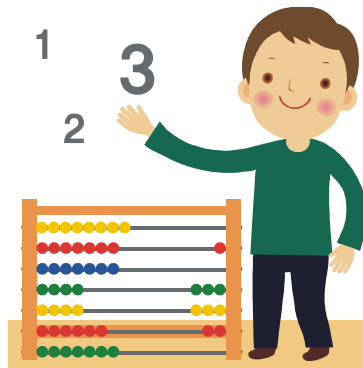


# Welcome to the Mad 4 Maths Information Workshop



**Presenter: Debra Bristow**

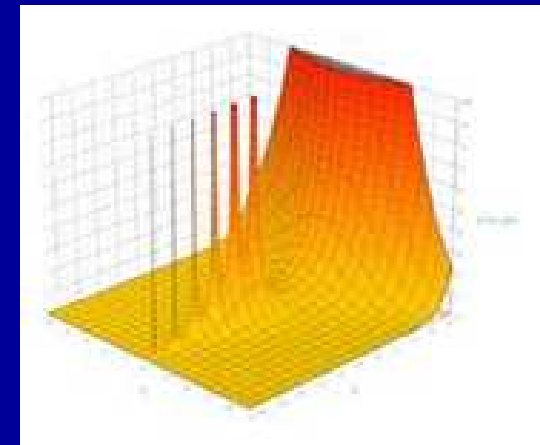


By the end of this session you will understand a little more about:

- The Australian Curriculum in Mathematics
- What your child is learning in maths
- How our teachers are teaching maths
- Ways to support your child's learning in maths

# 21<sup>st</sup> Century Maths

Jobs of the Future Ad



# Australian Curriculum: Mathematics

The Maths demands of the next generation may be quite different to those of our generation.

Maths teaching will need to prepare students for 21<sup>st</sup> Century real-world problems, both at work and in daily life

The aim of the Australian Mathematics Curriculum is to create confident, creative users and communicators of mathematics.

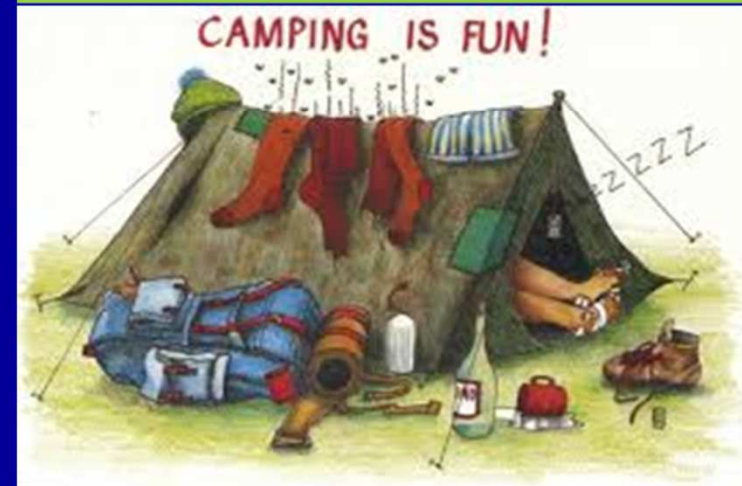
# How is Maths education different for this generation?

## The procedural camp



Previously we were taught mainly facts and procedures. Lessons were about practise and recall

## The understanding camp



Lessons ensure students have deep and connected understandings. Students are expected to explain, reason and justify.

# In the Australian Curriculum, we expect students to have:

- **Understanding**
  - (connecting, representing, identifying, describing, interpreting, sorting, ...)
- **Fluency**
  - (calculating, recognising, choosing, recalling, manipulating, ...)
- **Problem solving**
  - (applying, designing, planning, checking, imagining, ...)
- **Reasoning**
  - (explaining, justifying, comparing and contrasting, inferring, deducing, proving, ...)

# Test Question $201 - 198 =$

Jumped  
straight to a  
procedure and  
got it wrong

Jumped  
straight to a  
procedure and  
got it correct

Reasoned  
mentally  
Trusted  
Numbers

2/3

14%

25%

61%

4/5

25%

35%

40%

6/7

28%

41%

31%

**What methods do we use as adults?**

$$38 + 57$$

$$72 - 28$$



## Discussion

Most adults were shown one way to add and subtract, multiply and divide.

30% of Australian adults are unable to use the procedure that was drilled into us.

Often, these adults have 'ANXIETY' in situations that involve calculation.

# Going mental first

- Mental computation and estimation account for approximately 80% of the calculations we do in real life
- Using a calculator 15-18% of the time
- Paper and pencil methods 3-5% of the time

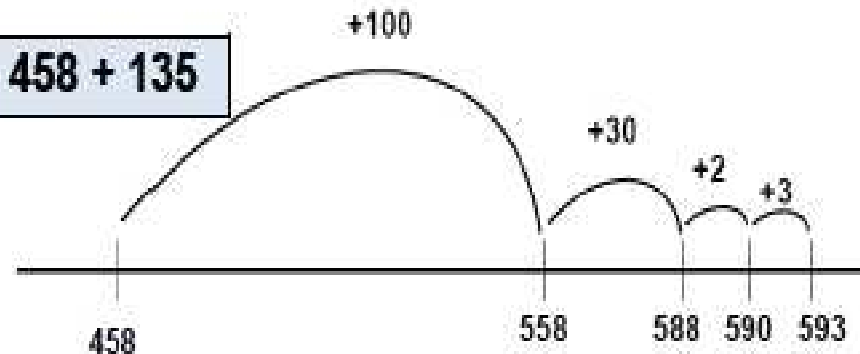
Most adults were not taught mental computation methods.

# JUMP- addition & subtraction

$35 + 23$

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69

$458 + 135$

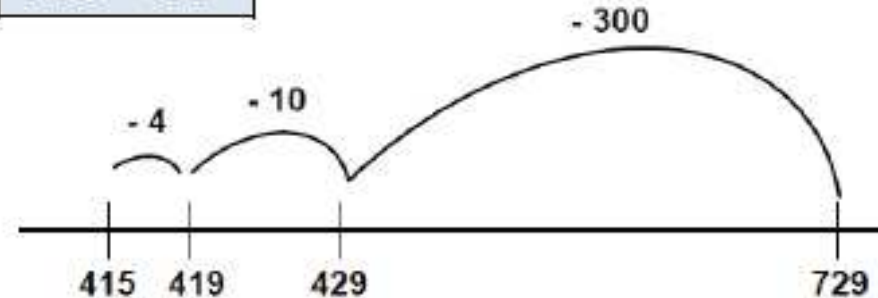


or

$76 - 33$

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89

$729 - 314$



or

# SPLIT: addition & subtraction

$$\begin{array}{r} 282 + 645 \\ \hline 200 + 600 = 800 \\ 80 + 40 = 120 \\ 2 + 5 = 7 \\ \hline \hline 927 \end{array}$$

$$\begin{array}{r} 375 - 142 \\ \hline 300 - 100 = 200 \\ 70 - 40 = 30 \\ 5 - 2 = 3 \\ \hline 200 + 30 + 3 = 233 \end{array}$$

**Students must be confident and flexible with Place Value concepts to assist with mental computation.**

## What about number facts?

- Addition and subtraction facts by Year 3
- Multiplication and division facts by Year 4
- A greater focus on mental methods to prepare students for real world situations
- A range of written methods (not just the one method)
- Students to choose methods and strategies to suit individual problems

“But, isn't maths just about getting the right answer?”

Would you agree or disagree with this statement?

$$[ ] = 7 + 5 + 3 + 5 + 6$$

How would you add these numbers?

$$[ ] = 7 + 5 + 3 + 5 + 6$$

This is 'string sum'. Sums of this type are a focus of Year 2 and 3.

Most students can calculate that the answer is 26...but they solve it in different ways.

**Teachers look for more than just a correct answer.**

$$[ ] = 7 + 5 + 3 + 5 + 6$$

**Child A** adds in order: 7,5,3,5 and then 6 (counting all on her fingers)

**Child B** says '7 and 3 make 10', '5 and 5 make 10' and '6 more is 26'

**Child C** says '5+5 = 10', then '6 + 3 = 9', 'so that's 19'. He then counts on 7 more

**Child D** takes 2 from 7 and adds it the 3 to make 4 lots of 5. She says, 'Four fives are 20. 20 and 6 more is 26.'



**RECALL**

$$5 + 7 = [ \quad ]$$

$$7 + 5 = [ \quad ]$$

**RELATED**

$$12 - 7 = [ \quad ]$$

$$5 + [ \quad ] = 12$$

**EXTENDED**

$$50 + 70 = [ \quad ]$$

$$120 = [ \quad ] + 70$$

**Model or represent this number fact**

**Can you create a story to match this number sentence?**

**CALCULATE**

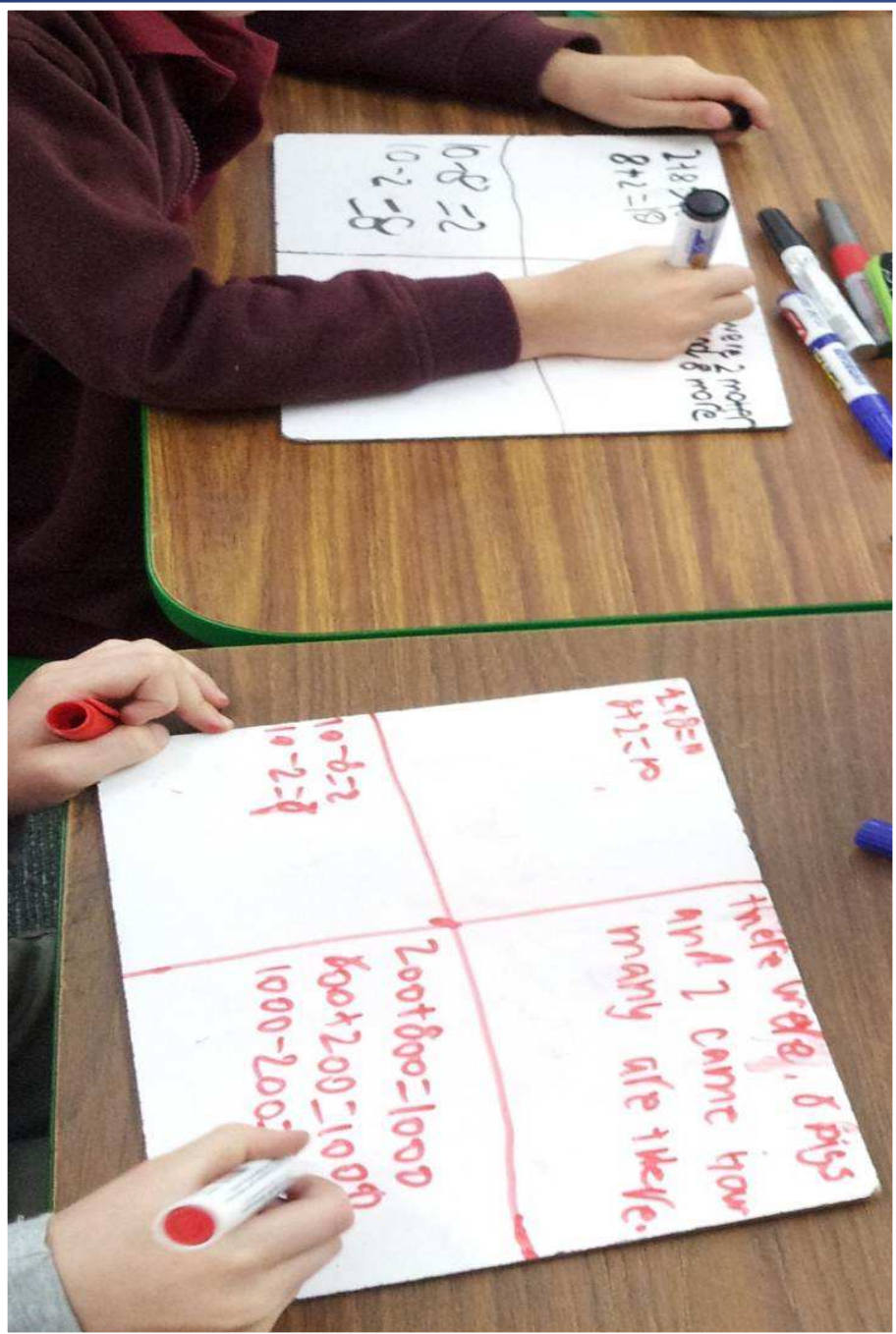
**Does the question require an exact answer or an estimate?**

**Which is the most efficient strategy for this number sentence?**

**What number facts are at the core of this calculation?**

**Children need to demonstrate more than recall of number facts alone.**

# FOUR SQUARE



**YEAR 1**

### NUMBER FACTS

$$8 + 4 = 12$$

$$4 + 8 = 12$$

### STORY

( drawing or oral )

*8 dogs are in the park. 4 more dogs arrive with their owners.  
Now there are 12 dogs.*

### RELATED FACTS

$$12 - 8 = 4$$

$$12 - 4 = 8$$

### EXTENDED FACTS

$$80 + 40 = 120$$

$$40 + 80 = 120$$

$$120 - 80 = 40$$

### NUMBER FACTS

$$3 \times 7 = 21$$

$$21 = 7 \times 3$$

### STORY

( drawing or oral )

*I had 3 bags of mangoes. There were 7 mangoes in each bag. How many mangoes did I have?*

### RELATED FACTS

$$21 \div 3 = 7$$

$$21 \div 7 = 3$$

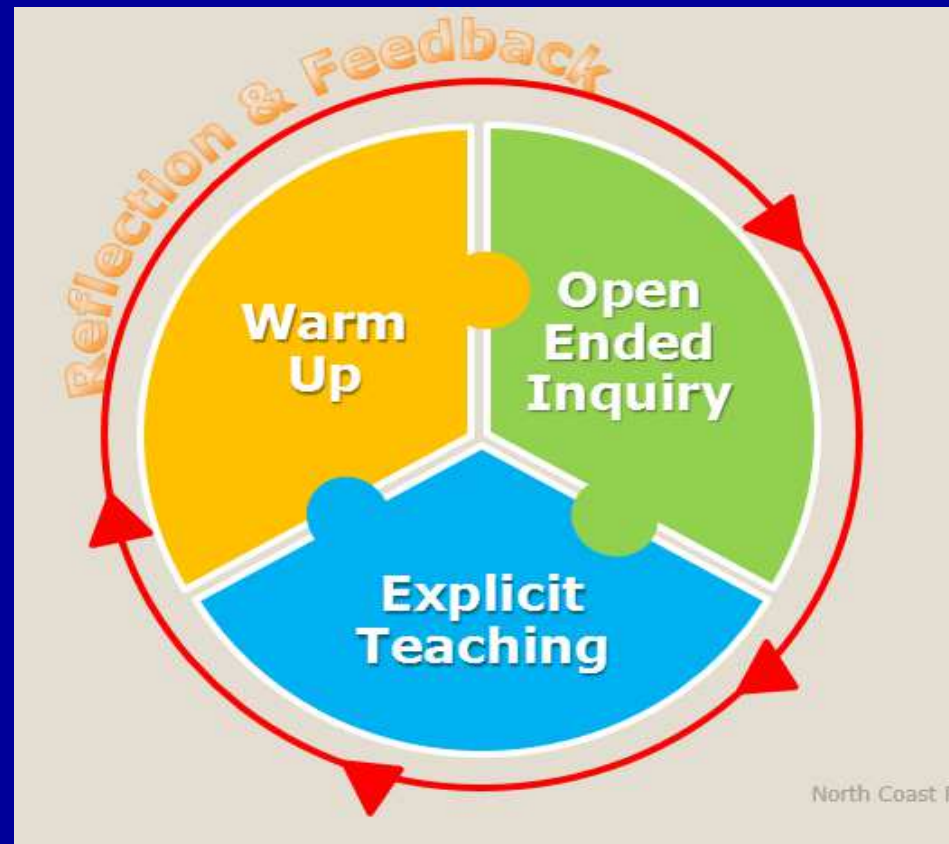
### EXTENDED FACTS

$$3 \times 70 = 210$$

$$2100 = 30 \times 70$$

$$210 \div 7 = 30$$

# Maths – The Woombye Way



[2016 Woombye Maths\\_Overview.docx](#)

# Show me know you know tests

[Yr 2 T2 Show me What you Know Test.docx](#)

**YEAR 2: Term 2 Show me what you know**

NAME \_\_\_\_\_

**1 to 1 Interview: Number Facts**

	Count all	Count back	Strategy	Recall
If you have 18 counters (place in hand) and take away 5 (take out of hand). How many counters do you have left?				
There are 12 counters (show them and count). I take away 5 (show them and then count). How many are left?				
When a line is drawn with 10 counters. Say: "Take away 5. How many are left?"				

1 Write a word problem that would match this number sentence:  $21 - 5 = \square$

\_\_\_\_\_

\_\_\_\_\_

2 Complete these number sequences

a) \_\_\_\_\_, \_\_\_\_\_, 85, 90, 95, \_\_\_\_\_, \_\_\_\_\_

b) \_\_\_\_\_, 43, 53, 63, \_\_\_\_\_, \_\_\_\_\_

c) What rule does this pattern follow?


\_\_\_\_\_

3 Partition this number in three different ways.


78

\_\_\_\_\_

\_\_\_\_\_

4  Show Eva an efficient way to add these numbers

$7 + 4 + 8 + 6 + 2 =$

5 


Place these numbers on the number line: 4, 16, 25

6 Complete this addition Part-Part-Whole grid.

9	5

Write all the number facts for this Part-Part-Whole grid.

7 Circle the coin worth the most?



8 Show how you would work out this addition problem in your head.

$31 + 45 =$




Show how you would work out this subtraction problem in your head.

$78 - 13 =$

9 Fill in the missing numbers from this section of a hundred board.

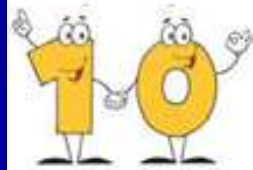
	48	

10 Show one half of each of the following:

a)     b)     c) 

# Numeracy Warm-ups

## Race to Ten



North Coast Region

Mathematics



**Big Idea:** Operate/Calculate

**Suits:** Years P -2

**Materials:** Tens frames, 6-sided dice, counters

**Instructions:**

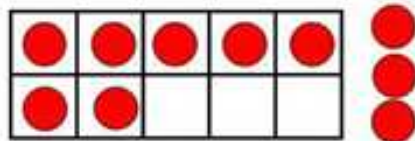
Students play this game in pairs.

Students take turns to:

- roll a die
- collect the matching number of counters
- place the counters on their tens frame
- state how many they have and how many more are needed to make ten, eg. *I have 3; I need 7 more to make 10.*

The winner is the first person to reach *exactly* 10.

Students will need to keep rolling until the desired number is rolled.



Extend the task to include the use of a 'twenty frame' (double ten frame).

23

## Teacher Notes

North Coast Region

Mathematics



*Race to Ten* provides students with the opportunity to practice their number bonds to ten. It also provides opportunity for students to subitise and partition. This is an excellent activity for reinforcing a range of strategies including doubles, near doubles, counting on, counting back, making up to the nearest 10.

**Be aware that:** Students may rely on inefficient strategies for counting and adding, including finger counting, or in the case of a die or counters, counting them individually.

**Differentiate the task by:**

- Work back from 10 using subtraction.
- Using a blank die with only 1, 2 and 3 written on it.
- Using a ten sided die
- Students only using even or odd numbers that are rolled.
- Create large tens frames with tape on the floor and play as a class, using plastic plates or beanbags as counters



**Guiding Questions:**

- *How did you add the counters?*
- *Can you count on from the counters that are already there?*
- *What are some of the combinations that add to exactly 10?*

# Your Turn

## Ladders

A game for small groups  
or Whole Class

**Big Idea:** Place Value

**Suits:** Years 1-7

**Materials:**

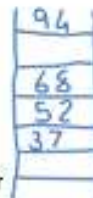
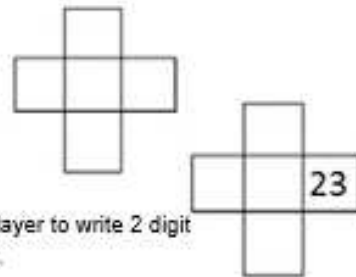
10 sided dice (2 per group)

The aim of the game is for each player to write 2 digit numbers and order them correctly.

**Instructions:**

- Each player draws a ladder with 6 rungs (7 spaces).
- Players take turns to roll the dice and use the digits to make a 2-digit number. For example, Player 1 rolls 6 and 8. He can make 68 or 86.
- Players write their chosen number in one of the spaces on their ladder.
- Players continue to roll the dice and add numbers to their ladder, keeping a sequence of smallest to biggest (bottom to top)
- The first player who fills their entire ladder is the winner.

There will be times when a player is unable to write a number on their ladder, they simply miss their turn. For example, a player with the ladder above rolls a 5 and a 6, there is nowhere to put 56 or 65, so they miss their turn.



## Teacher Notes

To play the game as a whole class, each student draws their own ladder. The teacher rolls the dice. Students choose the number to be made and write it on their own ladders. Students will complete their ladders at different times. Discuss students' strategies for playing the game.

**Be aware that:**

- The first time students play this game, they may not have a strategy for making and placing numbers.
- Have this discussion with them after the first game. Talk about the biggest and smallest numbers possible.

**Differentiate the task by:**

- Using three dice and making 3-digit whole numbers
- Rolling two dice to make numbers with decimals, eg. 6 and 8 are rolled. Possible numbers are 5.6 and 6.5
- Varying the number of rungs on the ladder.
- Using fewer or more dice to suit ages and abilities.
- Using a 6-sided dice.
- Having students record all possible numbers from their rolls, not just the one they are using.
- Giving students the lowest number and the highest number on the ladder. Students make and order numbers within the given range.

**Guiding Questions:**

- What strategy did you use when choosing numbers to put on the ladder?
- How did you decide where to place your numbers?
- What are you doing now that you weren't doing the first time you played this game?





# How is learning maths like an Easter Egg Hunt?



# Open-ended Tasks

Compare these Year 1 word problems.

Problem 1 - Santa had 7 sugar cookies and 3 chocolate chip cookies. How many cookies did Santa have?

Problem 2 - Santa had 10 cookies. Some were sugar and some were chocolate chip. How many of each could there be?

...kah.  
gifts.



Santa had 10 cookies. Some were sugar  
and some were chocolate chip.  
How many of each could he have?

$0 + 10 = 10$        $5 + 5 = 10$        $3 + 7 = 10$   
 $1 + 9 = 10$        $2 + 8 = 10$   
 $4 + 6 = 10$        $5 + 5 = 10$   
 $6 + 4 = 10$        $7 + 3 = 10$   
 $8 + 2 = 10$        $9 + 1 = 10$        $10 + 0 = 10$



# Common year level assessment tasks

## Yr 2 Block of Chocolate Assessment

### Western Whole School Assessment Framework: Mathematics

These tasks **MUST** be done by all classes. Teachers will use a range of formative assessment tools to monitor student progress. Teachers will make adjustments for students with specific needs to enable all students are able to access the tests. To ensure consistency of judgement, formal whole school moderation will take place early in Term 2 and Term 4 each year. Moderation tasks are in bold/italic.

Assessment Tasks	Prep	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>NCR Number Proficiency - Strand Diagnostics</b>	N/A	Teachers administer these tests each term as both pre and post-tests. Teachers mark and informally moderate these with year level colleagues. Teacher input the data into the Spreadsheet to generate diagnostic data to identify those student for whom the content <b>about, build, extend and to identify gaps, learning areas. Teachers complete the Number Diagnostic Placement.</b>					
<b>Standardised Testing</b> Administer at the end of Terms 1 and 3. Give tests to ST-UE (for marking).	Early Start Numeracy	I Can Do Maths Booklet B	PAT Maths Test Booklet A	PAT Maths Test Booklet 1	PAT Maths Test Booklet 2	PAT Maths Test Booklet 3	PAT Maths Test Booklet 4
<b>Semester 1 Summative Assessment Tasks (A-E)</b>  <b>Denote Moderation Task*</b>	<b>Big sort</b>  <b>Crazy Cards*</b>  <b>City Towers - Measurement</b>	<b>My Number*</b>  <b>Shape Shakers 2D</b>  <b>What is Our Favourite Fruit?</b>	<b>Addition and Subtracting Numbers*</b>  <b>Time</b>  <b>Location / Mapping Task</b>  <b>Representing Chance and Data</b>	<b>Addition/Subtract Problems*</b>  <b>Time</b>  <b>Count, Compare, Partition</b>  <b>NAPLAN</b>	<b>Knowing Numbers*</b>  <b>What are the Chances?</b>  <b>Legend Land</b>	<b>Digging Into Data*</b>  <b>Number Crunch</b>  <b>Generation Geometry</b>  <b>NAPLAN</b>	<b>Data Decoder</b>  <b>Robot Roundup</b>  <b>Order of operations*</b>  <b>Investigating angles</b>
<b>Semester 2 Summative Assessment Tasks (A-E)</b>  <b>Denote Moderation Task*</b>	<b>Knowing Numbers*</b>  <b>A Week of Events</b>  <b>Number Line Hop</b>  <b>Shape Task</b>	<b>Cool Calculations</b>  <b>Drop the Counters*</b>  <b>Party puzzle</b>  <b>On Time</b>  <b>Money <del>Task</del>Shape Shakers 2D</b>	<b>Secret Number</b>  <b>Block of Chocolate*</b>  <b>Money and Calendars</b>  <b>Telling Time</b>	<b>Chance Experiment</b>  <b>All About a Fraction*</b>  <b>Multiplication</b>  <b>Money</b>  <b>Where is It? (Location/Geography)</b>	<b>Fraction Fun*</b>  <b>Marvellous Measurement</b>  <b>Ready Decimals</b>  <b>Data Analysis</b>	<b>Great Gardens*</b>  <b>Fantastic Factors &amp; Marvellous Multiples</b>  <b>What is the Chance of That?</b>  <b>Semester 2 Number &amp; Algebra Test</b>	<b>Number properties, patterns and computation*</b>  <b>Solving Measurement Problem</b>

# Teacher Professional Learning Teams

Teachers collaborating:

- to share effective teaching methods
- to moderate their marking of students' work

# Summary

- The goal of school Mathematics is to prepare students for 21<sup>st</sup> Century real-world problems, at work and in daily life.
- Maths education is concerned with more than 'just getting the right answer'.
- Children can be confident, creative users and communicators of mathematics.

# Summary

- Students' knowledge of number facts (basic facts) is vital
- In real world situations, most calculations are performed mentally
- Confident users of maths can use different strategies for adding and subtracting and choose the most efficient method according to the situation.

# How can you help at home?

- Talk about ways that you use to add and subtract mentally.
- Practise number facts in game situations.
- Don't expect your children to naturally add and subtract like you do.
- Let your children discuss their ways for adding and subtracting with you.



Resist the temptation  
“ This is how you should do it”

Ask your child to explain their  
strategies for adding and subtracting

Ask your child for an estimate before  
they calculate the exact answer

Ask “Is that answer reasonable?”

# Adding number plates



Questions?