MATHEMATICS WORKSHOP FOR PARENTS (PRIMARY 5 AND 6)

5 March 2021

AIMS OF WORKSHOP

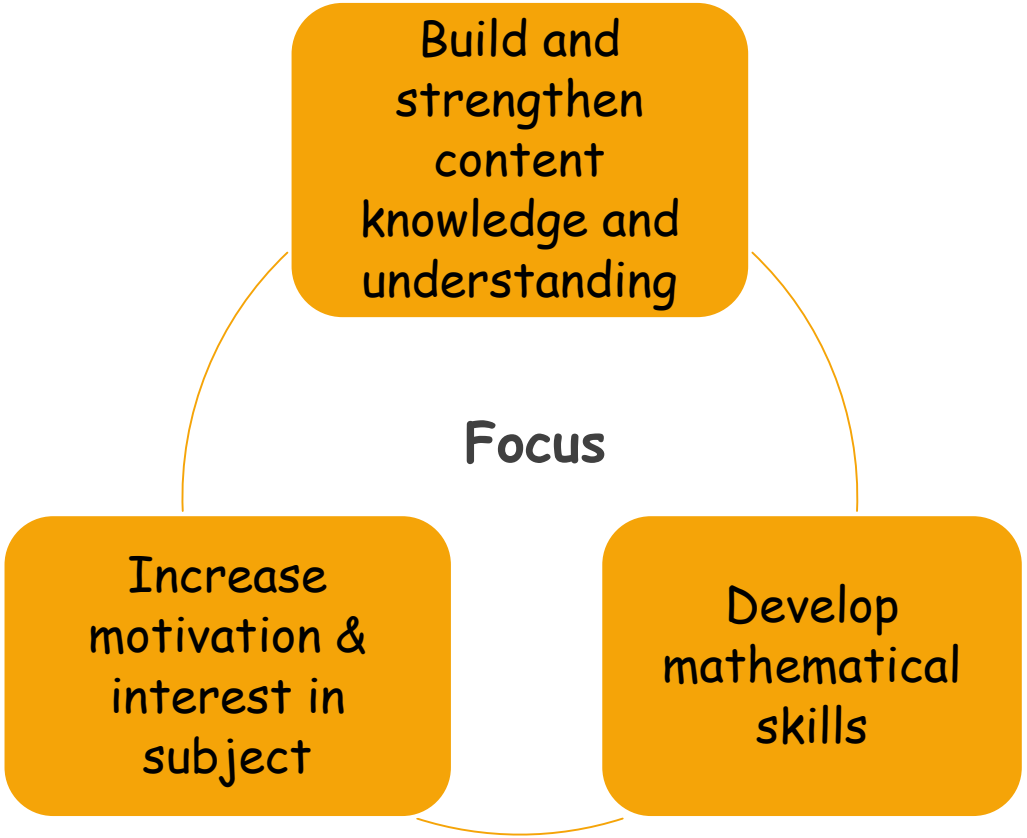
(1) Assessment Structure

(2) Basic Understanding of the Model Method

(3) Proper Presentation of Mathematical Solutions

It’s not about learning so that I can teach my child

TEACHING AND LEARNING



Teaching Approaches

Concrete-Pictorial-Abstract (CPA)

Gradual Release Responsibility (GRR)

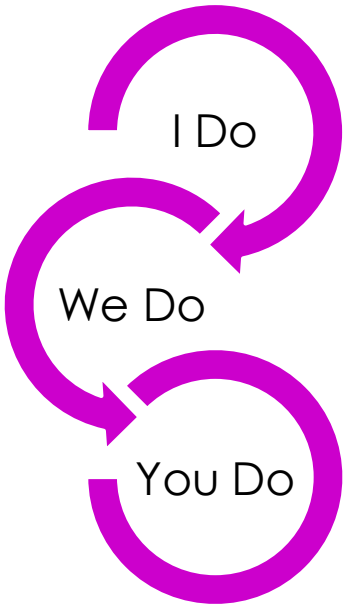
Problem Solving

Teaching approaches

	Characteristics
Concrete	Use of manipulatives, measuring tools or objects
Pictorial	Use of drawings, diagrams, charts or graphs
Abstract	Use of abstract representations such as numbers and letters

Concrete
Pictorial
Abstract (**CPA**)

Gradual **R**elease
Responsibility (**GRR**)



Teacher Demonstrates

Teacher/Students Do Together

Students Try on Their Own

TEACHING AND LEARNING

P1 – P2

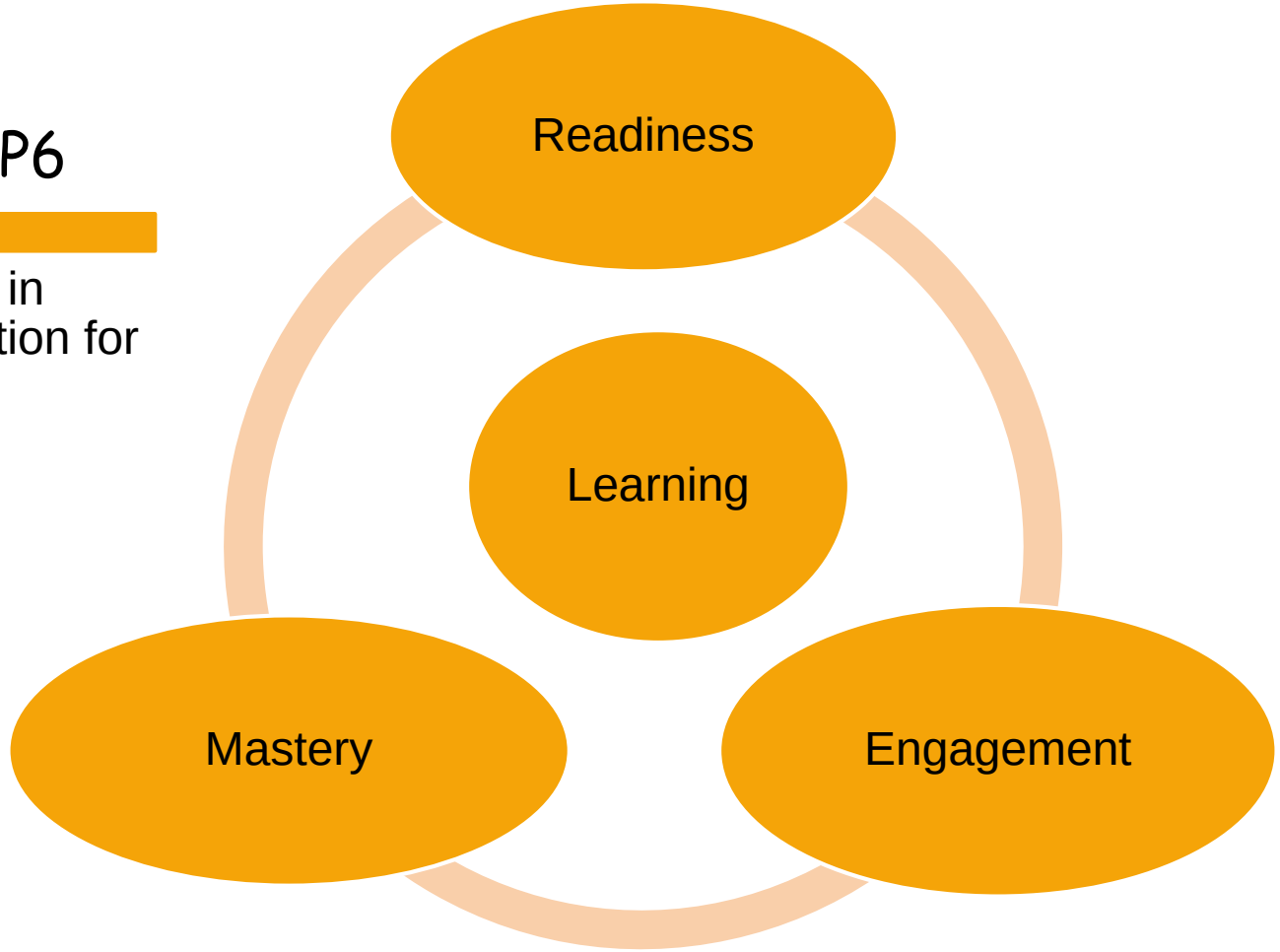
Building on Foundation in Numeracy

P3 – P4

Leverage on Strengths and Work on Weaknesses

P5 – P6

Mastery in Preparation for PSLE

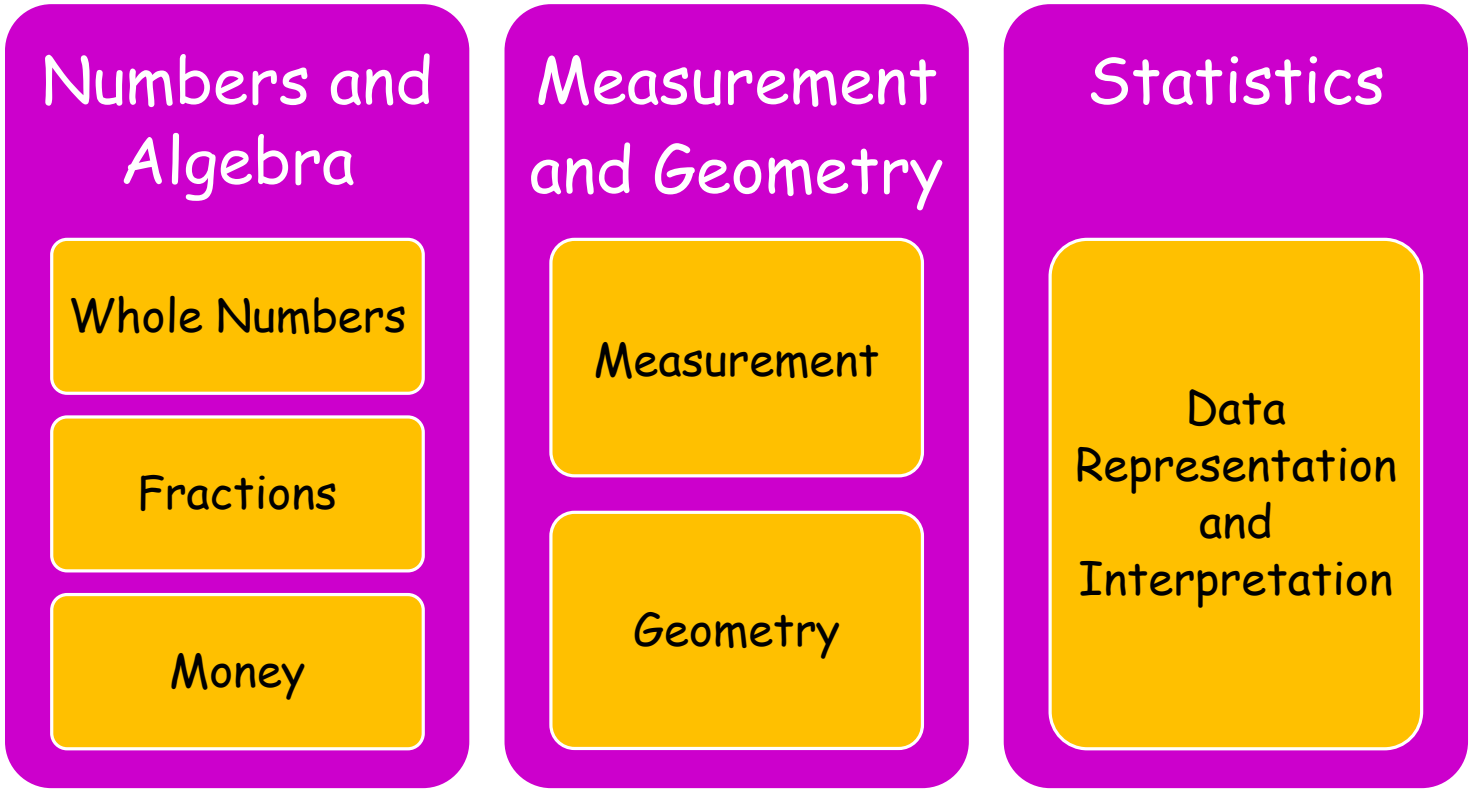


Curricula Goal

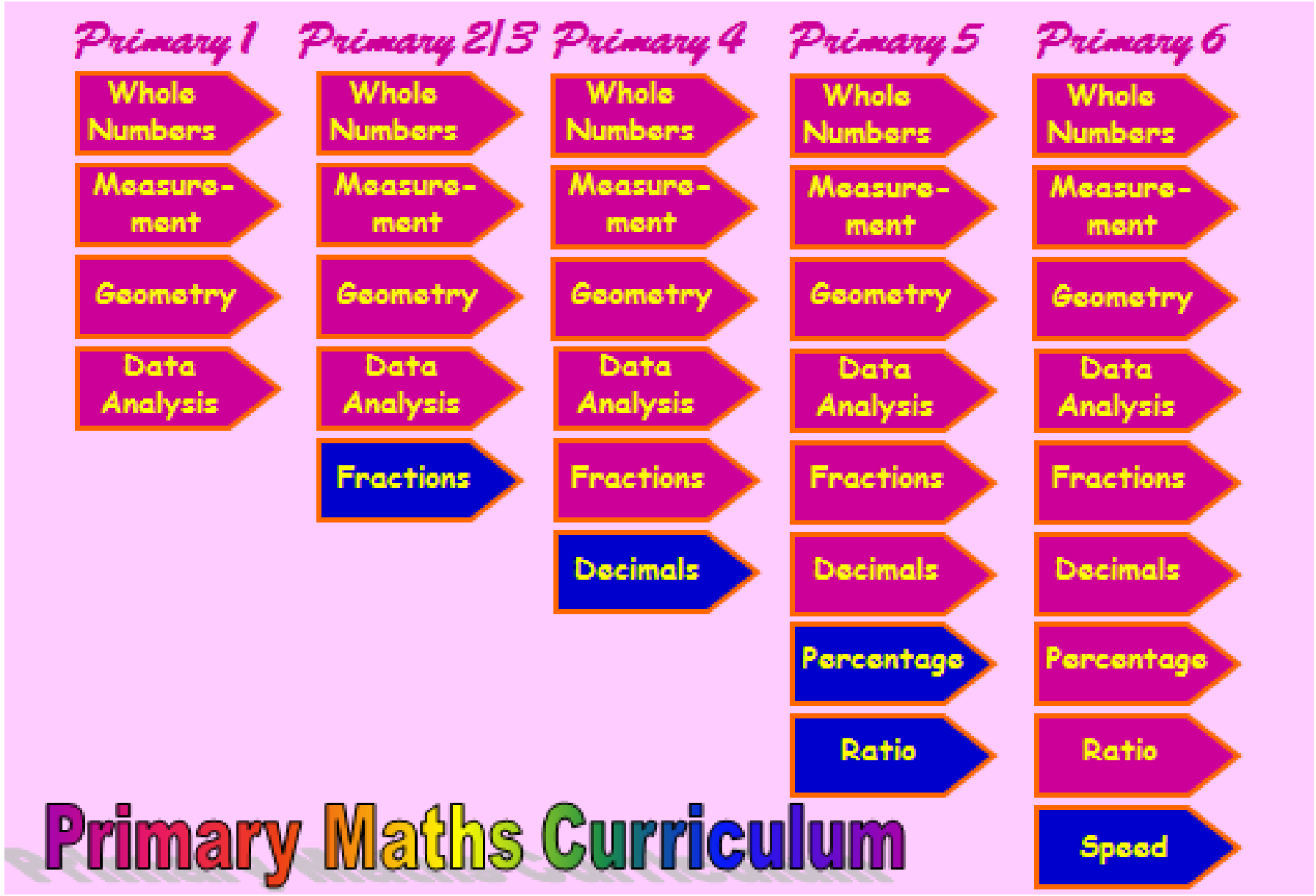
Competent Problem-Solvers

CURRICULUM

Content Strands – Spiral Curriculum



CURRICULUM


Primary 1
Whole Numbers
Measure-ment
Geometry
Data Analysis
Primary 2|3
Whole Numbers
Measure-ment
Geometry
Data Analysis
Fractions
Primary 4
Whole Numbers
Measure-ment
Geometry
Data Analysis
Fractions
Decimals
Primary 5
Whole Numbers
Measure-ment
Geometry
Data Analysis
Fractions
Decimals
Percentage
Ratio
Primary 6
Whole Numbers
Measure-ment
Geometry
Data Analysis
Fractions
Decimals
Percentage
Ratio
Speed
Primary Maths Curriculum

Heuristics Progression from P1 to P5

P1	P2	P3	P4	P5
Act It Out	Act It Out	Act It Out	Act It Out	Act It Out
Draw a Diagram	Draw a Diagram	Draw a Diagram	Draw a Diagram	Draw a Diagram
Make a List	Make a List	Look for Patterns	Look for Patterns	Look for Patterns
	Look for Patterns	Make a List	Make a List	Make a List
	Work Backwards	Work Backwards	Work Backwards	Work Backwards
		Guess and Check	Guess and Check	Guess and Check
		Simplify the Problem	Simplify the Problem	Simplify the Problem
			Restate the Problem	Restate the Problem
			Solve Part of the Problem	Solve Part of the Problem
				Make a Supposition

Purpose of Assessment

The Semestral asessments (SA) assesses the extent to which students have attained and achieved the learning outcomes specified in the Mathematics syllabus.

Purpose of Assessment

The learning outcomes cover mathematical concepts, skills and processes in the syllabus.

The paper also assess the learning outcomes from the *previous years* that support current learning.

ASSESSMENT

ASSESSMENT ITEM TYPES

Multiple Choice Questions (MCQ)	• Four options are provided of which only one is correct • For each question, a student chooses the correct answer and shade in the **OAS**.
Short Answer Questions (SAQ)	• For each question, a student writes his answer in the space provided. • For questions which require units, give answers in the units stated. • Working steps are optional but where applicable, a method mark may be awarded for correct working if the answer is wrong.
Long Answer Questions (LAQ)	• Workings, equations and statements are to be shown • Method marks are awarded for critical steps of workings

ASSESSMENT

Primary 5

- No SA1

- Focus on formative assessment
  - Lesson-based (e.g. questioning)
  - Authentic Learning
    - Learning Experiences
  - Topical / Learning Reviews (Progressive – check students' mastery of concepts and skills)

ASSESSMENT

Primary 5 Assessment Structure

TERM 1	TERM 2	TERM 3	TERM 4
Learning Review	Weighted Assessment (15%)	Weighted Assessment (15%)	SA (70%)

SA Format

Standard Mathematics	
Weighted Assessment (WA)	SA
• Total Marks 40 • Paper 1 (45 minutes) – Section A (MCQ) – Section B (SAQ) – Section C (LAQ)	• Total Marks 100 • 2 Papers – Paper 1 (1 h) - Booklet A (MCQ) - Booklet B (SAQ) – Paper 2 (1 h 30 min) - SAQ - LAQ

Foundation Mathematics	
Weighted Assessment (WA)	SA
• Total Marks 35 • Paper 1 (45 minutes) – Section A (MCQ) – Section B (SAQ) – Section C (LAQ)	• Total Marks 90 • 2 Papers – Paper 1 (1 h) - Booklet A (MCQ) - Booklet B (SAQ) – Paper 2 (1 h) - SAQ - LAQ

ASSESSMENT

Comparison of SA Format (P4 & P5)

Primary 4	Primary 5
❖ Total Marks 100 ❖ 1 Paper • Paper (1 hour 45 minutes) ○ Section A (MCQ) ○ Section B (SAQ) ○ Section C (LAQ)	<u>Standard Mathematics</u> ❖ Total Marks 100 ❖ 2 Papers • Paper 1 (1 hour) ○ Booklet A (MCQ) ○ Booklet B (SAQ) • Paper 2 (1 hour 30 minutes) ○ SAQ ○ LAQ <u>Foundation Mathematics</u> • Total Marks 90 • 2 Papers – Paper 1 (1 hour) ○ Booklet A (MCQ) ○ Booklet B (SAQ) – Paper 2 (1 hour) ○ SAQ ○ LAQ

ASSESSMENT

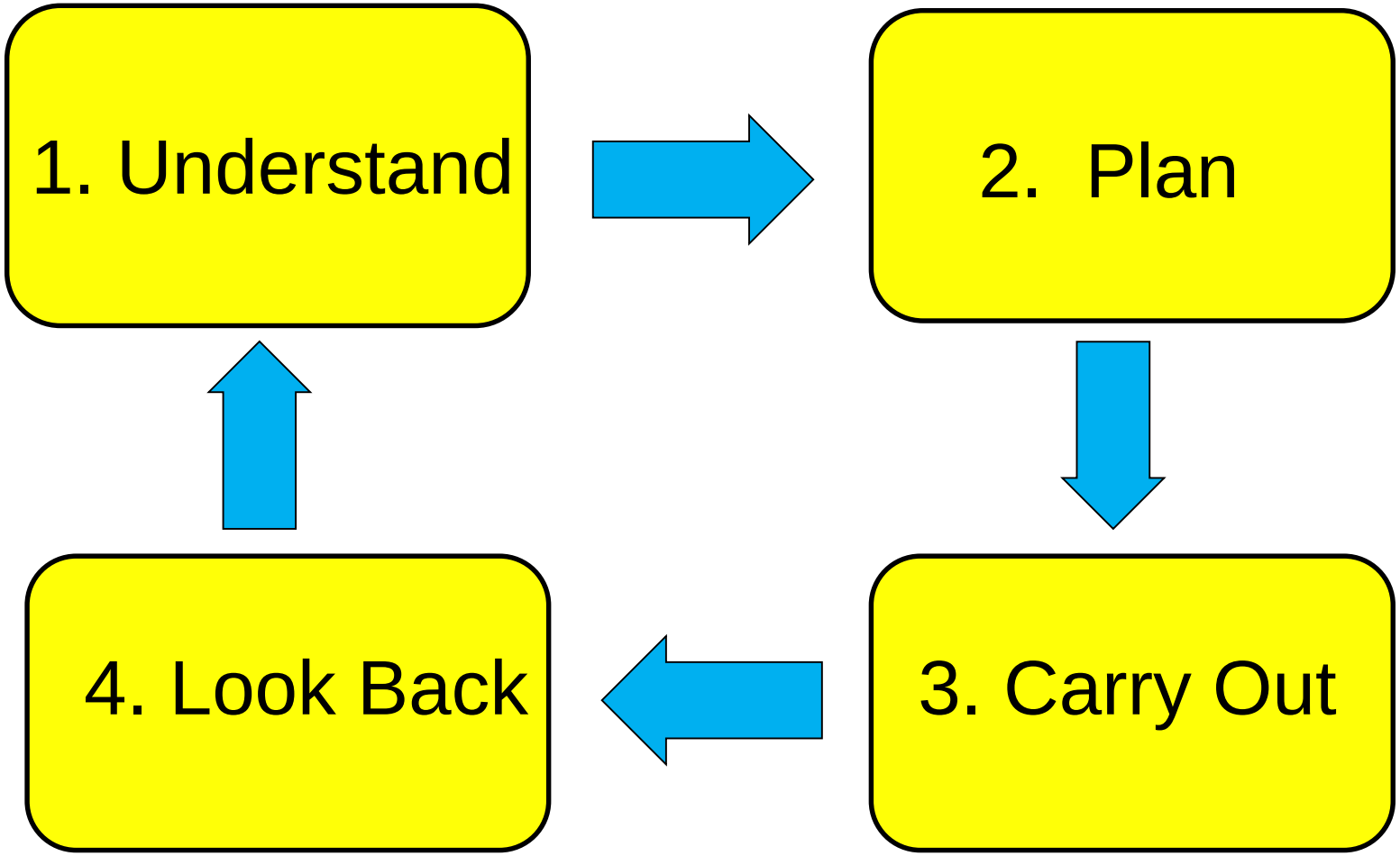
Primary 6 Assessment Structure

TERM 1	TERM 2	TERM 3
Learning Review	SA	Prelims

SA and Prelims Format

Standard Mathematics	Foundation Mathematics
• Total Marks 100 • 2 Papers – Paper 1 (1 hour) • Booklet A (MCQ) • Booklet B (SAQ) – Paper 2 (1 hour 30 minutes) • SAQ • LAQ	• Total Marks 90 • 2 Papers – Paper 1 (1 hour) • Booklet A (MCQ) • Booklet B (SAQ) – Paper 2 (1 hour) • SAQ • LAQ

POLYA'S 4 STEPS MATHEMATICAL PROBLEM SOLVING APPROACH



STEP 1 - UNDERSTAND THE PROBLEM

Study the Problem

- Read the problem a couple of times to fully understand it
- Ask questions like
  - What do I know?
  - Who is involved?
  - What do I not know?
  - What is the problem asking for?
- Highlight and connect the information

STEP 2 - MAKE A PLAN

Think of a Plan

- Think about the different strategies that could be used
- Ask questions like
  - Which strategy should I use?
  - Have I solved similar questions before?
- Keep track of strategies tried unsuccessfully so as not to repeat them on similar type of problem

STEP 3 - CARRY OUT THE PLAN

Solve the problem

- Represent the content in the form of i.e. model, diagram, table, etc. while solving the problem
- Ensure approach is systematic
- If “stuck”, repeat Step 1 to check if question is understood correctly

STEP 4 – LOOK BACK ON YOUR WORK (CHECK)

Reflecting

- Ask questions like:
  - Does my answer make sense?
  - Is there a better alternative?
  - Have I answered the question?
- Feed the answer derived back into the question to get back the original set of knowns
- Extend the solution to other problems

Heuristics in Mathematics are…

- ✓ processes and strategies that are essential in problem solving.
- ✓ increase the probability / chances of solving a mathematical word problem

No fixed heuristics for any one word problem

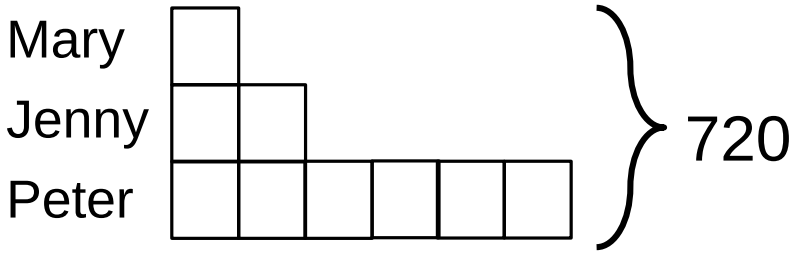
Draw a Model

When you draw a diagram or model, what does it do?

- ✓ Change words into recognizable pictures for the mind
- ✓ Helps to visualize and better understand the problem
- ✓ Helps to reorganize the data and see their relationship

Jenny has twice as many stickers as Mary . Peter has three times as many stickers as Jenny. If they have a total of 720 stickers, how many stickers does Jenny have?

Model



Number Equations

9 units = 720 stickers

1 unit = (720 ÷ 9) stickers

= 80 stickers

2 units = (80 x 2) stickers

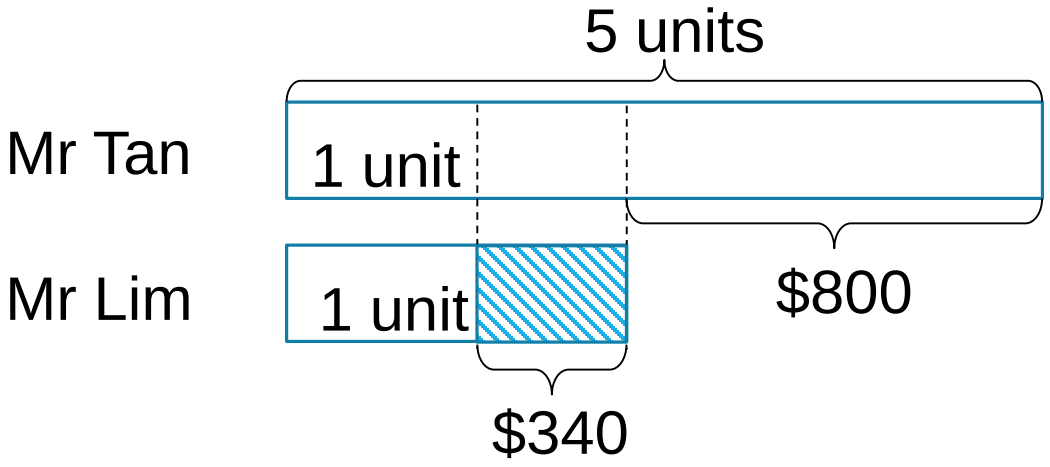
= 160 stickers

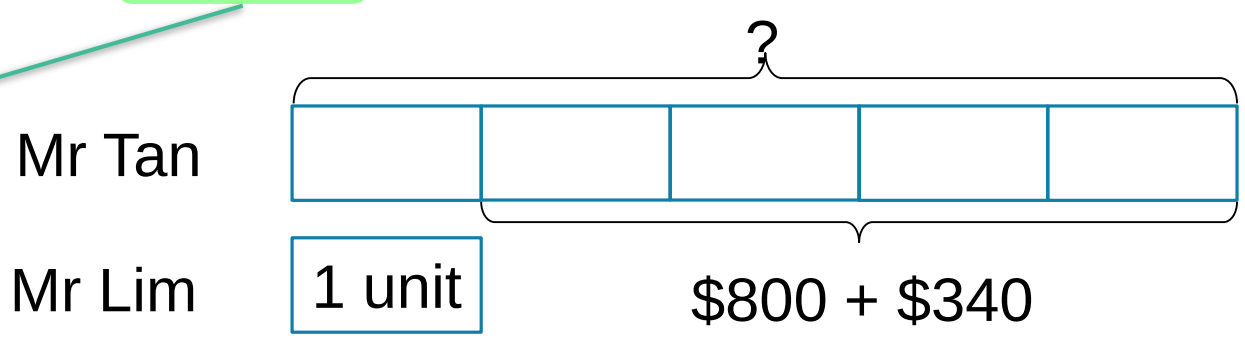
Answer Statement

Jenny has **160 stickers**

Mr Tan had $800 more than Mr Lim at first. After Mr Lim had spent $340, Mr Tan had 5 times as much money as Mr Lim. Find the amount of money Mr Tan had at first?

Model





Number Equations

4 units = $800 + $340
= $1140

1 unit = $1140 ÷ 4
= $285

5 units = $285 × 5
= $1425

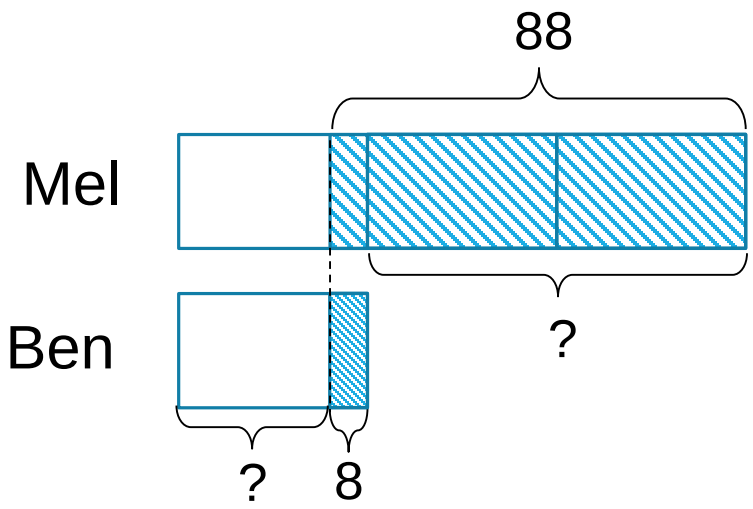
Answer Statement

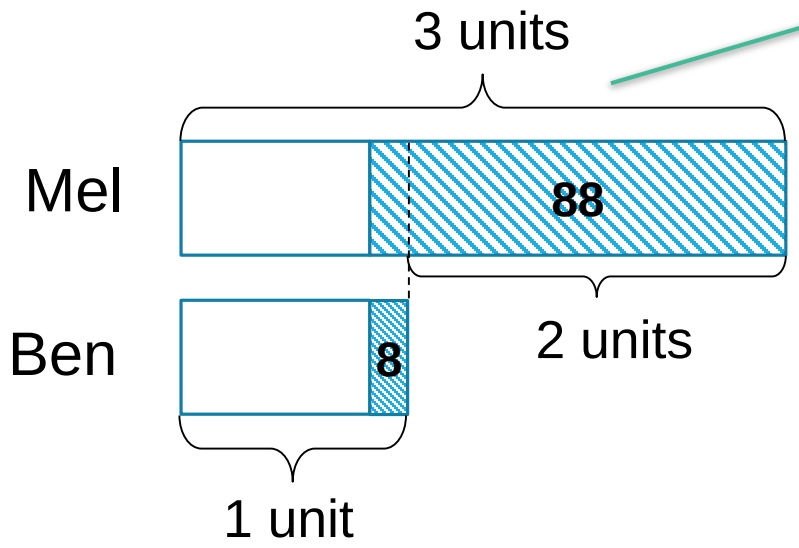
Mr Tan had $1425 at first.

Let's Practise (1)

Question 1: Mel had 3 times as many stickers as Ben. After Mel had given away 88 stickers and Ben had lost 8 of his stickers, they had the same number of stickers left. How many stickers did each of them have in the end?

Model





Number Equations

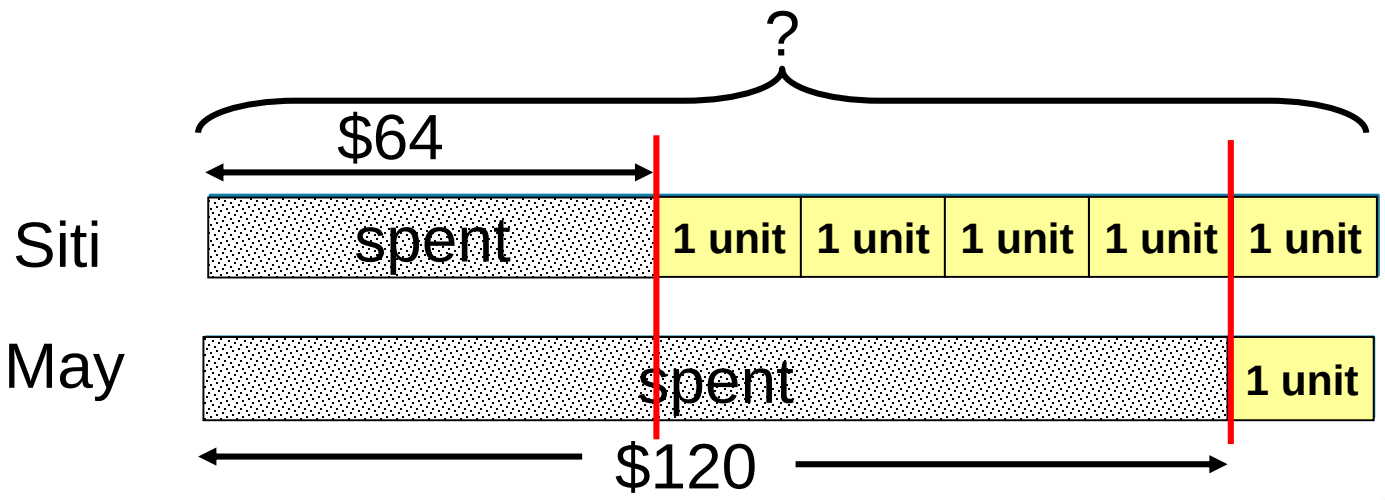
2 units = 88 – 8
= 80
1 unit = 80 ÷ 2
= 40
40 – 8 = 32

Answer Statement

Each of them had 32 stickers in the end.

Question 2: Siti and May went shopping with the same amount of money. After Siti spent $64 and May spent $120, Siti had 5 times as much money as May. How much money did each girl bring along for shopping?

Model



Number Equations

4 units = $120 - $64
= $56
1unit = $56 ÷ 4
= $14

Answer Statement

Amount each girl had at first = $120 + $14
= $134

MATHEMATICS PROGRAMME

Presentation of Mathematical Solutions

(1) Clear Working

- Intermediate Statements (where necessary)
- Number Equations

(2) Statements

- Final Answer Statements

(3) Units (when necessary)

- Standard Units & Non-standard Units

PRESENTATION

Beware

- Mathematically incorrect workings/statements

  Some examples

  - Use of wrong units or wrong use of equal signs
    - 20 - 5 = 15 + 3 = 18 x 2 = 36
    - 1.5 = 90
    - 3 apples = $1.50

3 apples = $1.50 ×
Cost of 3 apples = $1.50 ✓

    - Apples : Oranges = 5 : 3

Apples : Oranges = 5 : 3 ×
Number of Apples: Number of Oranges = 5: 3 ✓

  - Missing units
    - 5000 = 5 km

PRESENTATION

Avoid the use of arrows and long dash

- For example
  - Amount of money → $40 - $12 = $28
  - 7 units → 28 boys
  - 7 units -------- 28 boys

Proper use of labels. Avoid the use of short forms.

- For example
  - B, G for Boys, Girls (Spell out in full)

PRESENTATION

Last year, 700 pupils took part in a Mathematics competition. 28% of them were girls. This year, more girls took part in the Mathematics competition and they made up 37% of the participants. The number of boy participants was the same as last year. How many pupils took part in the Mathematics competition this year?

Solution:

Intermediate statement

Number of boys in the competition last year $= \frac{72}{100} \times 700$

$= 504$

Number equation

63% 504

1% 504 ÷ 63 = 8

100% 8 x 100 = 800

Final Answer Statement

800 pupils took part in the Mathematics competition this year.

Unit

Let's Practise (2)

Question 1: Mr. Lee had a total of 28 chickens and goats on his farm. There were 78 legs in all. How many goats were there?
(A chicken has 2 legs. A goat has 4 legs.)

Intermediate statement

Assume all the 28 animals are chickens.

Number equation

Number of legs = 28 x 2 = 56

Remaining number of legs = 78 – 56 = 22

Final Answer Statement

22 ÷ 2 = 11 animals have 4 legs

There were <u>11 goats</u>.

Unit

Question 2: The ratio of the number of boys to the number of girls was 3 : 2 at a party. Balloons were given out. Each group of 3 boys shared 4 balloons and 2 balloons were given to each girl. If a total of 200 balloons were given out, find the number of girls at the party.

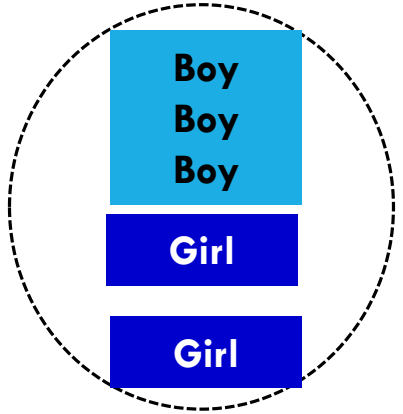
Number of balloons given out per set
= 4 + 2 + 2
= 8

Intermediate statement

Total number of sets
= 200 ÷ 8
= 25

Number equation

Consider 3 boys and 2 girls as a set



2 x 25 = 50

Final Answer Statement

There were 50 girls at the party

Unit