

# **MATHEMATICS WORKSHOP FOR PARENTS (PRIMARY 3 AND 4)**

**5 March 2021**

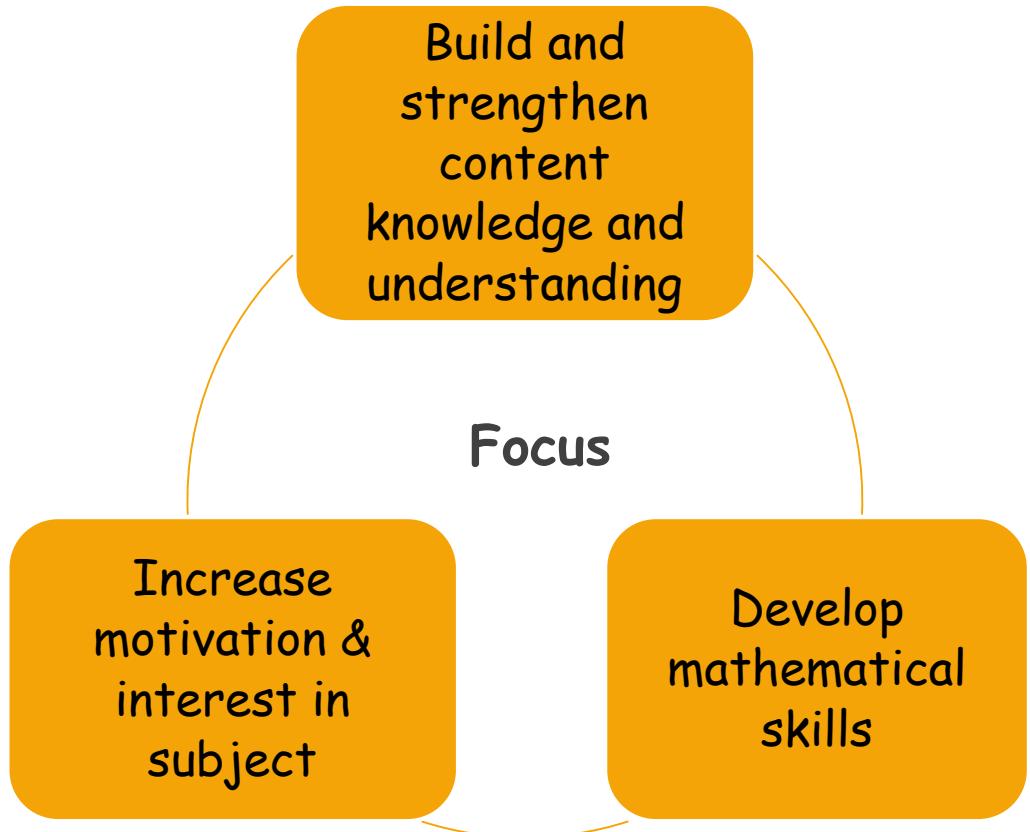


# AIMS OF WORKSHOP

- (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**

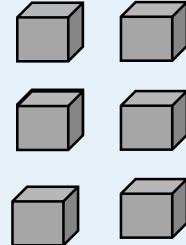
# TEACHING AND LEARNING



Teaching Approaches  
Concrete-Pictorial-Abstract (**CPA**)  
Gradual Release Responsibility (**GRR**)  
Problem Solving

# Teaching approaches

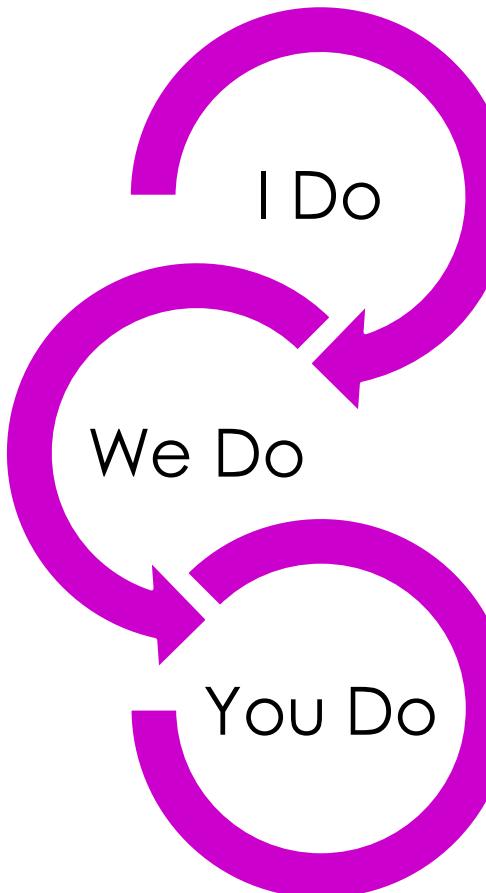
## Concrete Pictorial Abstract (CPA)

	Characteristics	Example
Concrete	Use of manipulatives, measuring tools or objects	 Count using objects
Pictorial	Use of drawings, diagrams, charts or graphs	Count using diagrams 
Abstract	Use of abstract representations such as numbers and letters	Write the number statement $3 \times 2 = 6$

# Teaching approaches

**Gradual Release  
Responsibility  
(GRR)**

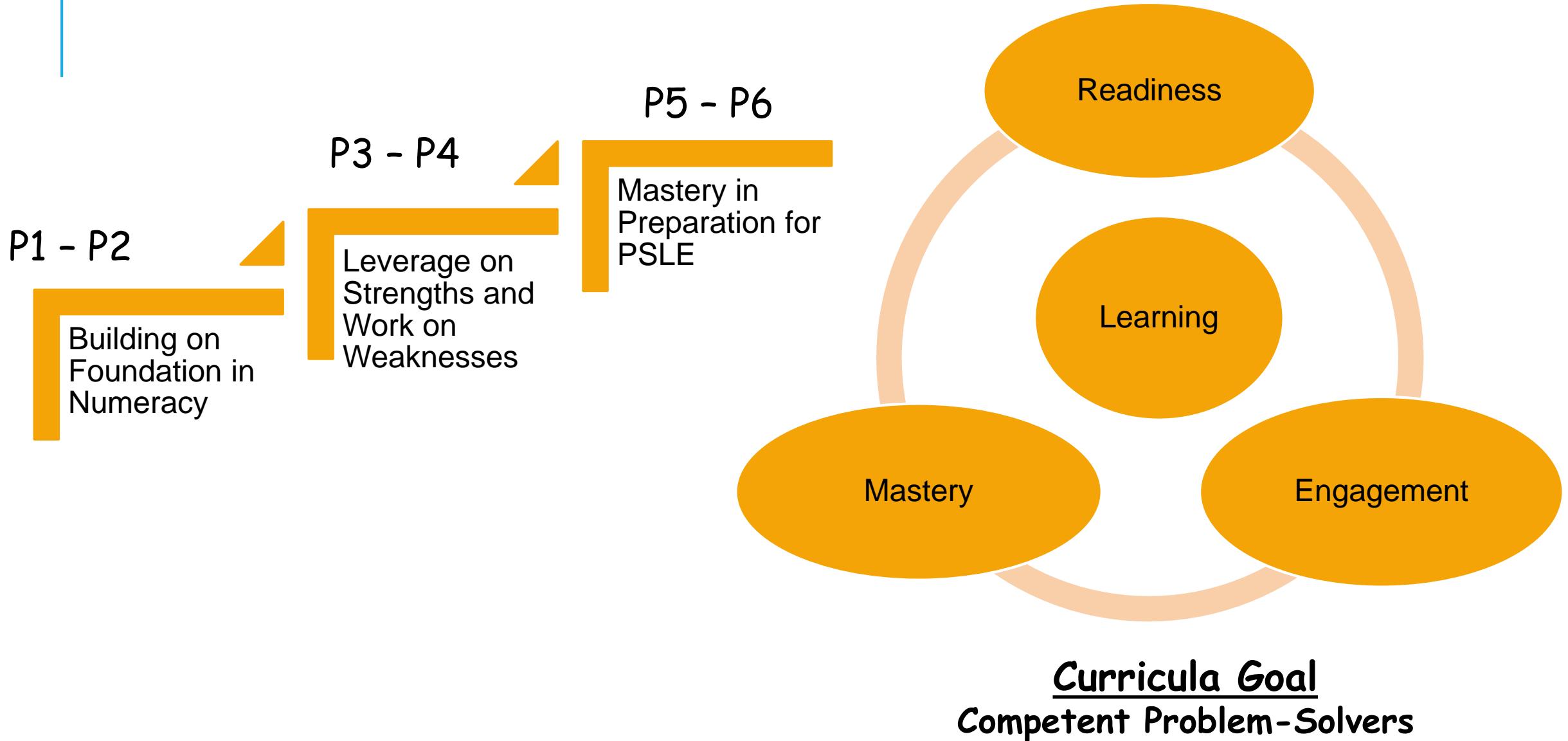
Teacher/Students Do Together



Teacher Demonstrates

Students Try on Their Own

# TEACHING AND LEARNING



# CURRICULUM

## Content Strands - Spiral Curriculum

### Numbers and Algebra

Whole Numbers

Fractions

Money

### Measurement and Geometry

Measurement

Geometry

### Statistics

Data Representation and Interpretation

# CURRICULUM

*Primary 1 Primary 2/3 Primary 4*

Whole  
Numbers

Measure-  
ment

Geometry

Data  
Analysis

Whole  
Numbers

Measure-  
ment

Geometry

Data  
Analysis

Fractions

Whole  
Numbers

Measure-  
ment

Geometry

Data  
Analysis

Fractions

Decimals

**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 Assessments (SA) assess 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 3

- 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 3 Assessment Structure

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

### Format

Weighted Assessment (WA)	SA
<ul style="list-style-type: none"><li>• <b>Total Marks 30</b></li><li>• <b>1 Paper (45 minutes)</b><ul style="list-style-type: none"><li>– <b>Section A (MCQ)</b></li><li>– <b>Section B (SAQ)</b></li><li>– <b>Section C (LAQ)</b></li></ul></li></ul>	<ul style="list-style-type: none"><li>• <b>Total Marks 80</b></li><li>• <b>1 Paper (1 hour 30 minutes)</b><ul style="list-style-type: none"><li>– <b>Section A (MCQ)</b></li><li>– <b>Section B (SAQ)</b></li><li>– <b>Section C (LAQ)</b></li></ul></li></ul>

# ASSESSMENT

## Primary 4 Assessment Structure

TERM 1	TERM 2	TERM 3	TERM 4
<b>Learning Review</b>	<b>SA1 (30%)</b>	<b>Learning Review</b>	<b>SA2 (70%)</b>

### SA Format

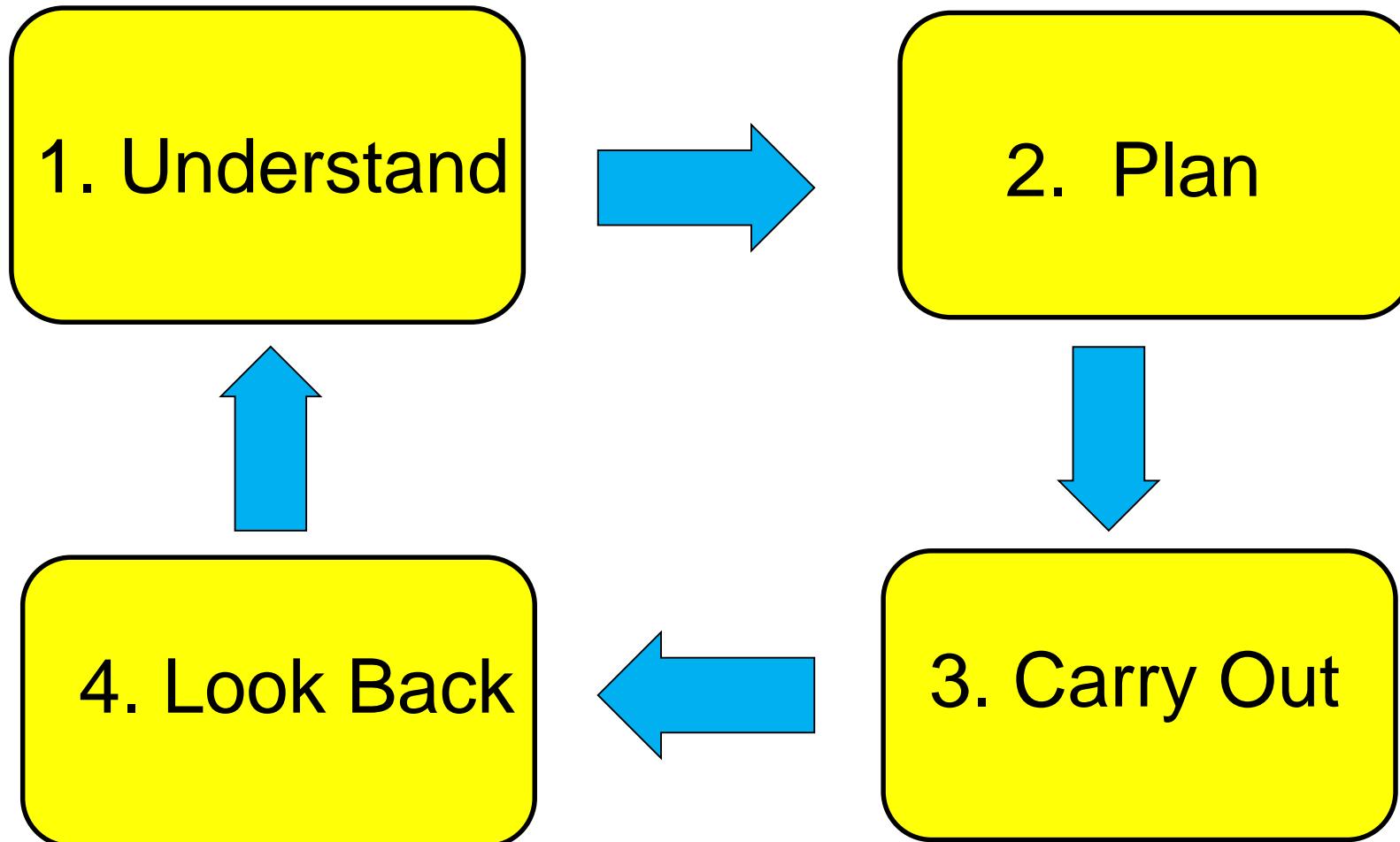
- **Total Marks 100**
- **1 Paper (1 hour 45 minutes)**
  - **Section A (MCQ – Multiple-Choice Questions)**
  - **Section B (SAQ – Short Answer Questions)**
  - **Section C (LAQ – Long Answer Questions)**

# ASSESSMENT

## Comparison of SA Format (P3 & P4)

Primary 3	Primary 4
<ul style="list-style-type: none"><li>• <b>Total Marks 80</b></li><li>• <b>1 Paper (1 hour 30 minutes)</b><ul style="list-style-type: none"><li>○ <b>Section A (MCQ)</b></li><li>○ <b>Section B (SAQ)</b></li><li>○ <b>Section C (LAQ)</b></li></ul></li></ul>	<ul style="list-style-type: none"><li>• <b>Total Marks 100</b></li><li>• <b>1 Paper (1 hour 45 minutes)</b><ul style="list-style-type: none"><li>○ <b>Section A (MCQ)</b></li><li>○ <b>Section B (SAQ)</b></li><li>○ <b>Section C (LAQ)</b></li></ul></li></ul>

# POLYA'S 4 STEPS MATHEMATICAL PROBLEM SOLVING APPROACH



# **STEP 1 - UNDERSTAND THE PROBLEM**

- **Read** for understanding
- **Chunk** the information
- **Organise** the information
- **Connect** the information
- “Is there a pattern I can recognise so that I can use a given strategy immediately?”

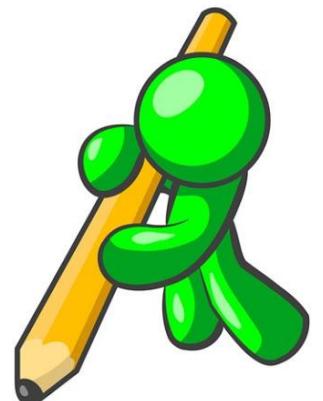
## STEP 2 - MAKE A **PLAN**

- **Ask** “What strategy is most useful at this point in time?”
- **Select** the strategy that is most suitable to solve the question



## **STEP 3 - CARRY OUT THE PLAN**

- **Apply** the mathematical skills, concepts and strategies.
- At every step, **ask** “What information will allow me to move on? What’s next?”
- **Present** solution clearly and logically.
- **Track** every step of working.



## **STEP 4 – LOOK BACK ON YOUR WORK (CHECK)**

- **Read** the question again. Is my answer reasonable?
- Did I **use** the numbers given?
- Can we improve on the method used and seek alternative solutions?



# 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**

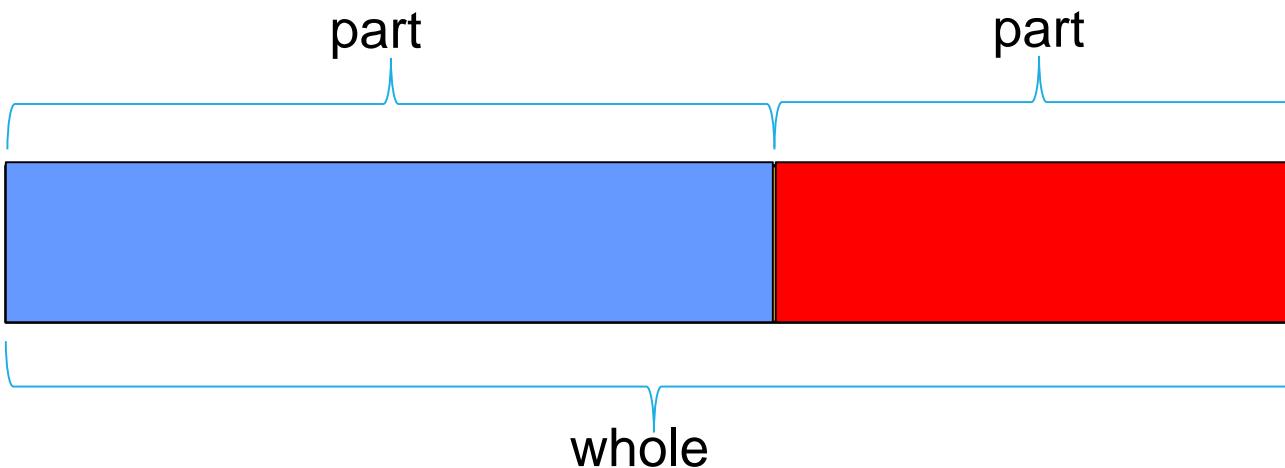
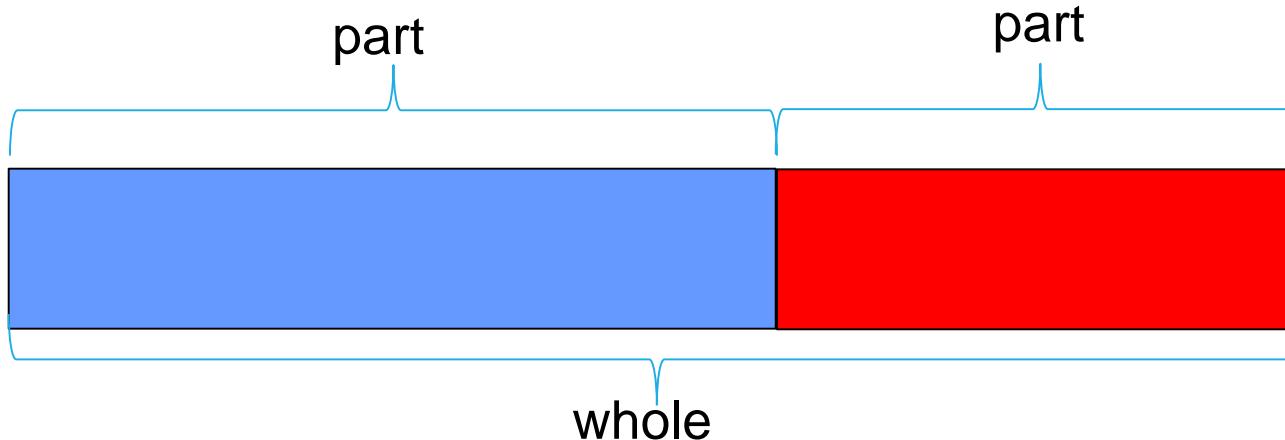
# **Draw a Model**

**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

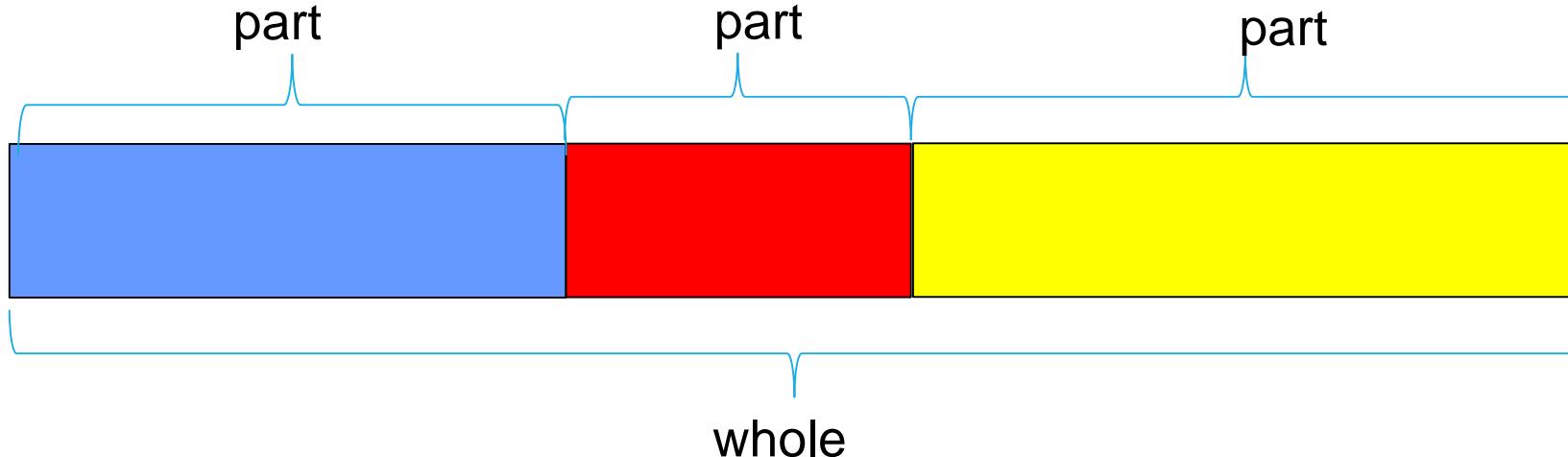
# TYPES OF MODELS

## Part – Whole Model



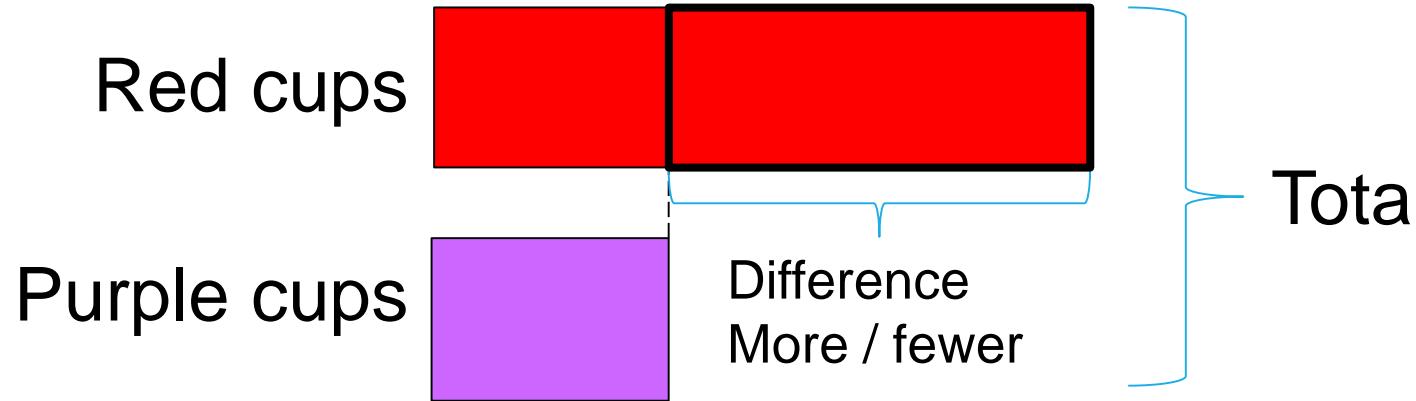
# TYPES OF MODELS

## Part – Whole Model



# TYPES OF MODELS

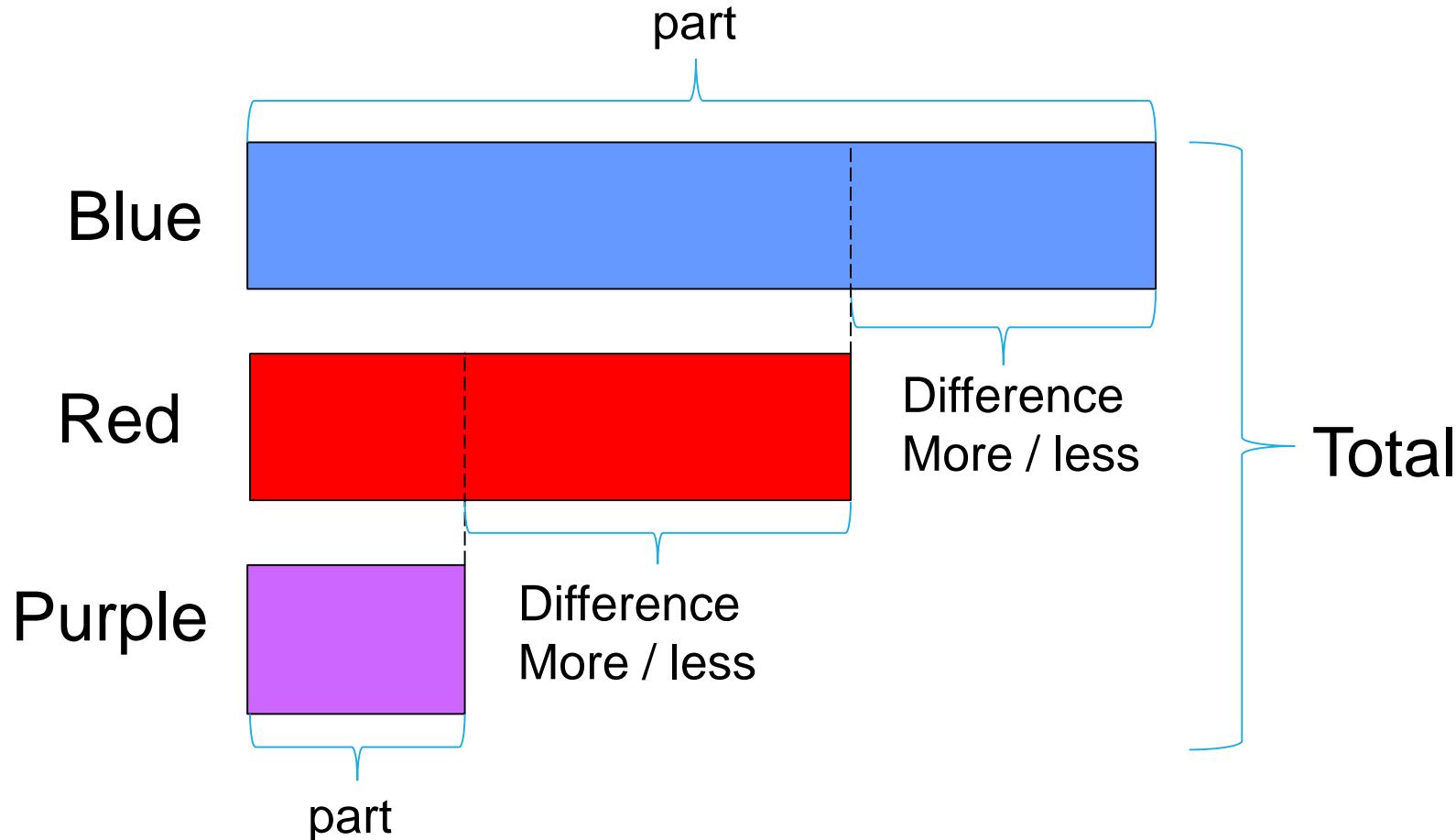
## Comparison Model



- How many **more** **Red** cups are there than **Purple** cups?
- How many **fewer** **Purple** cups are there than **Red** cups?
- Find the **difference** the number of **Red** cups and the number of **Purple** cups.

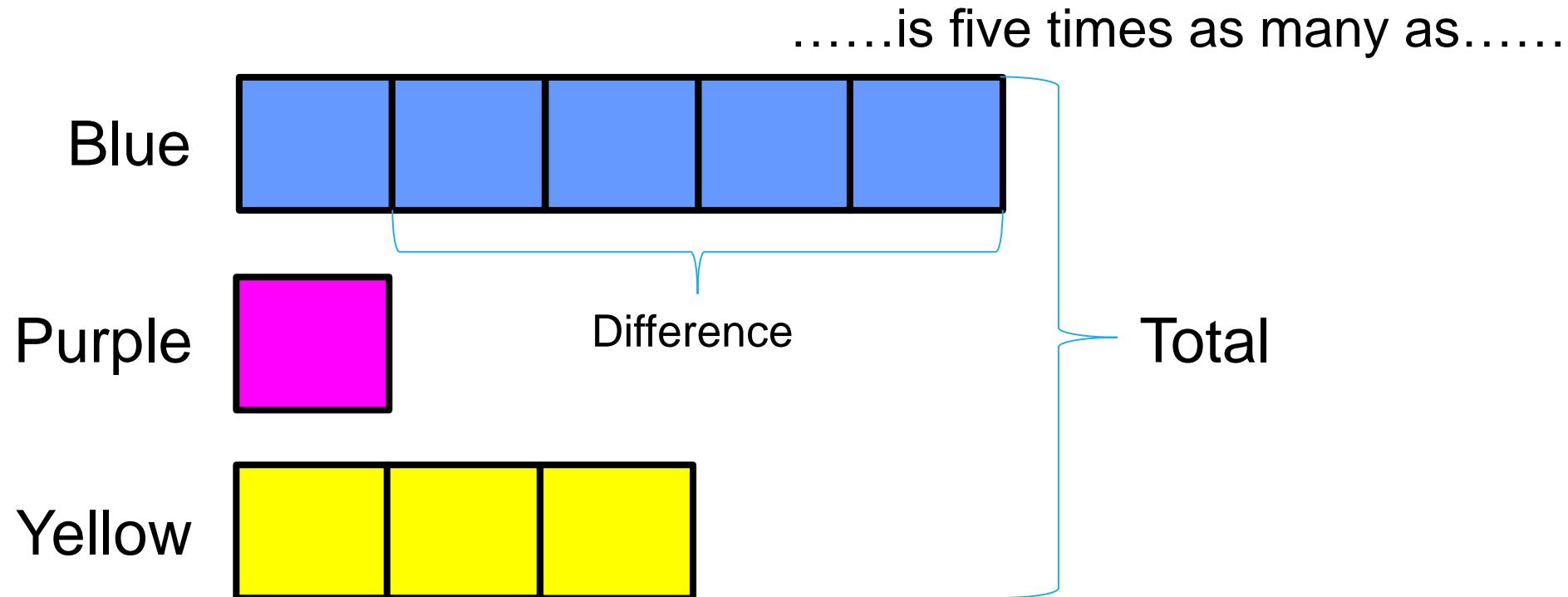
# TYPES OF MODELS

## Comparison Model



# TYPES OF MODELS

## Comparison Model



..... is three times as many as.....

# Part-Whole model

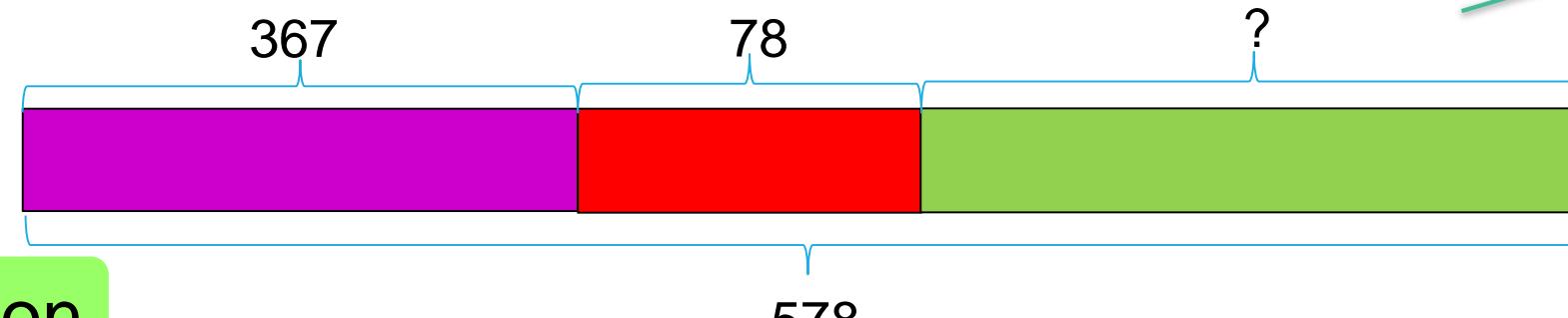
There are **578** beads.

**367** of them are purple.

**78** of them are red and the rest are green.

How many green beads are there?

Model



## Number Equation

### Method 1

$$367 + 78 = 445$$

$$578 - 445 = 133$$

### Method 2

$$578 - 367 = 211$$

$$211 - 78 = 133$$

### Method 3

$$578 - 78 = 500$$

$$500 - 367 = 133$$

There are 133 green beads.

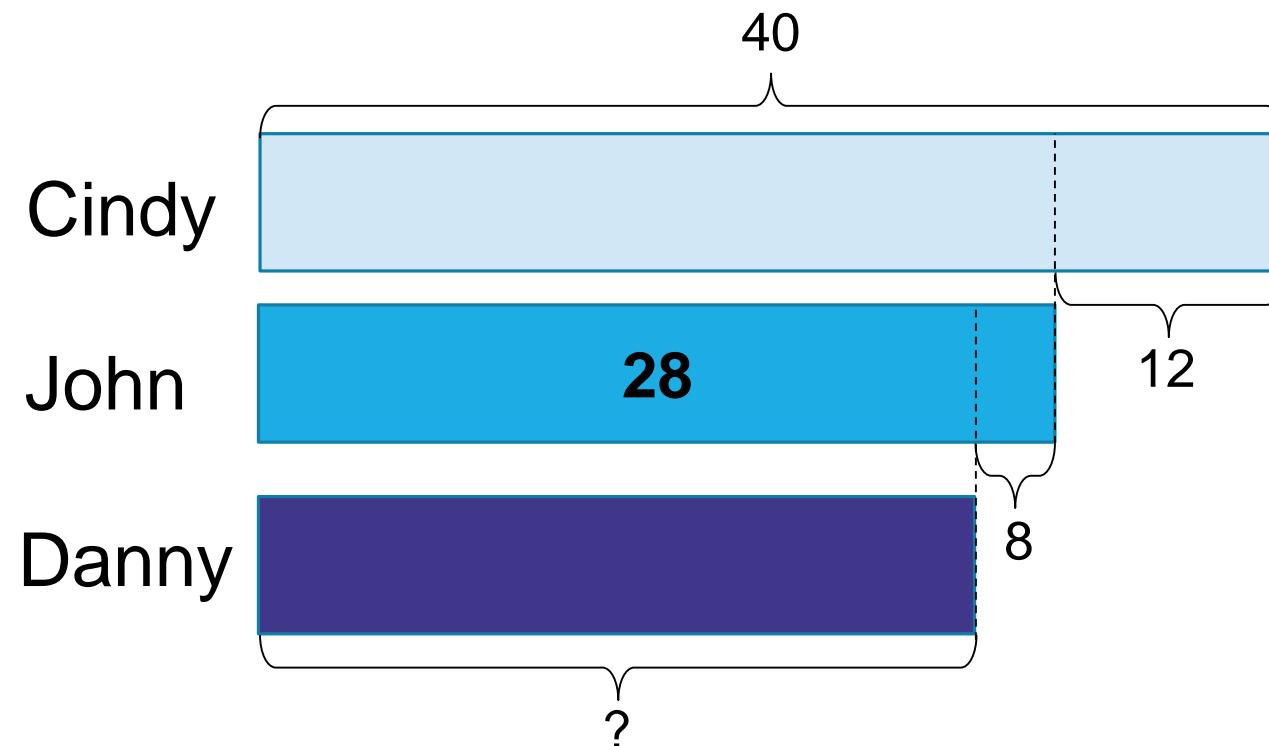
Answer Statement

# Comparison model

Cindy is 12 years older than John.

Danny is 8 years younger than John.

If Cindy is 40 years old, how old is Danny?



Model

Number Equation

$$40 - 12 = 28$$

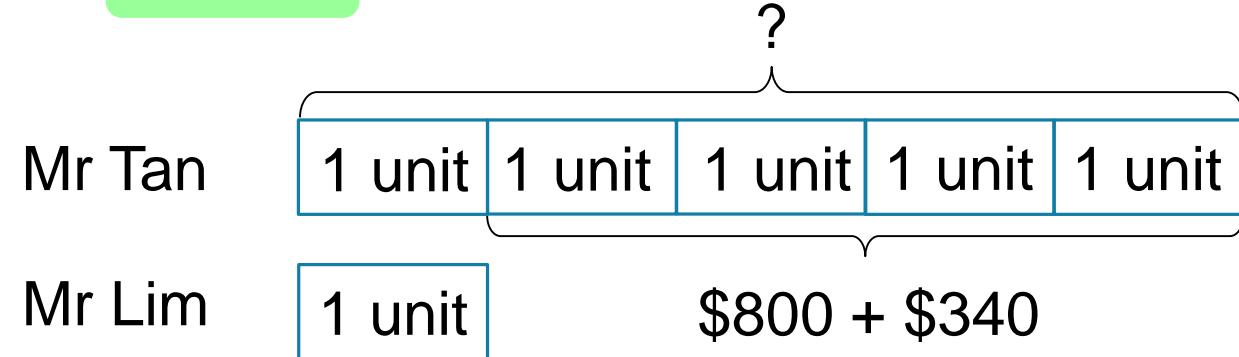
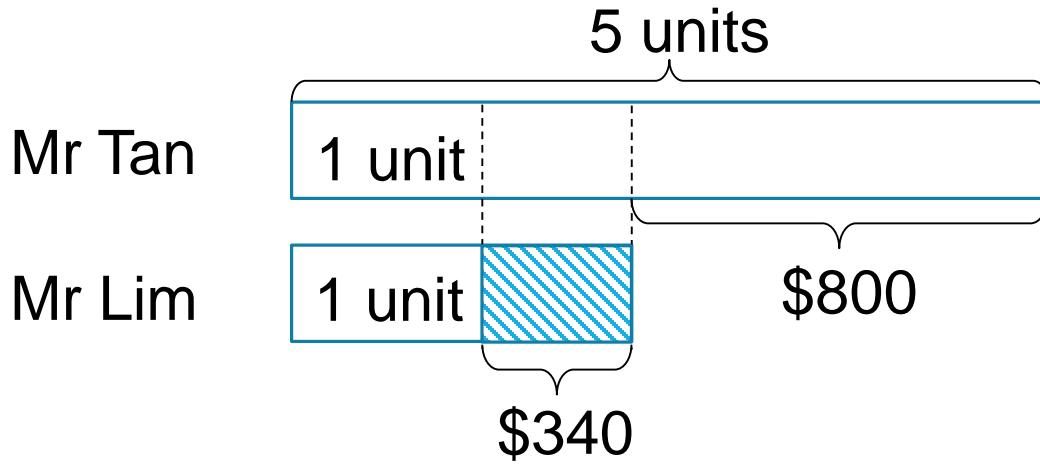
$$28 - 8 = 20$$

Danny is 20 years old.

Answer Statement

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



$$\begin{aligned}4 \text{ units} &= \$800 + \$340 \\&= \$1140\end{aligned}$$

$$\begin{aligned}1 \text{ unit} &= \$1140 \div 4 \\&= \$285\end{aligned}$$

$$\begin{aligned}5 \text{ units} &= \$285 \times 5 \\&= \$1425\end{aligned}$$

### Number Equation

### Answer Statement

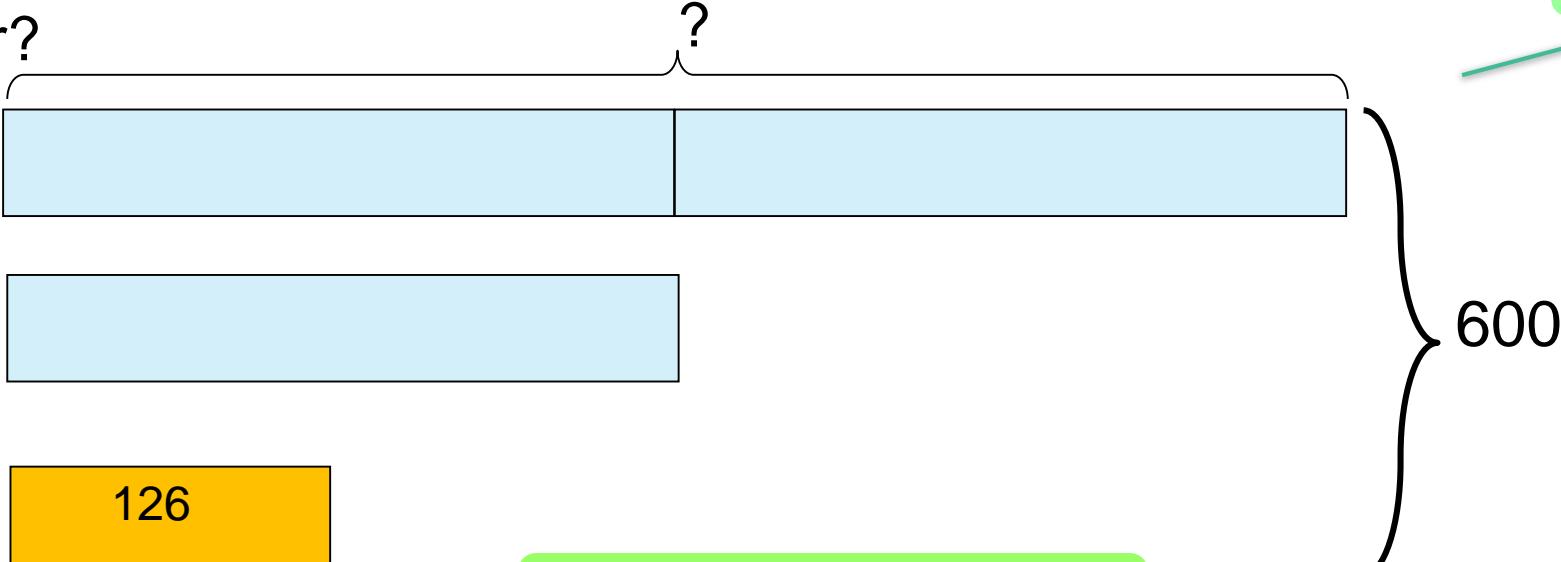
Mr Tan had \$1425 at first.

Let's  
Practise (1)

**Question 1:** The sum of 3 numbers is 600. The first number is twice as big as the second number. The third number is 126. What is the biggest number?

Model

First number



Second number

Third number

126

Number Equation

$$\begin{aligned}3 \text{ units} &= 600 - 126 \\&= 474\end{aligned}$$

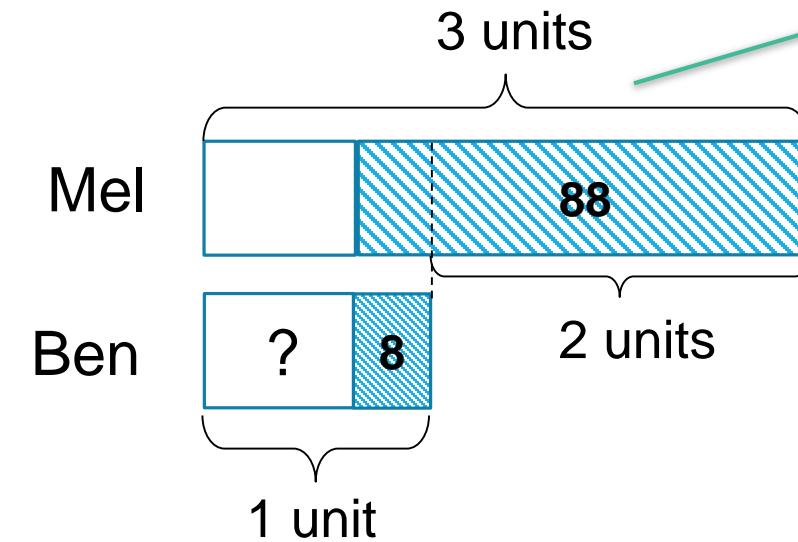
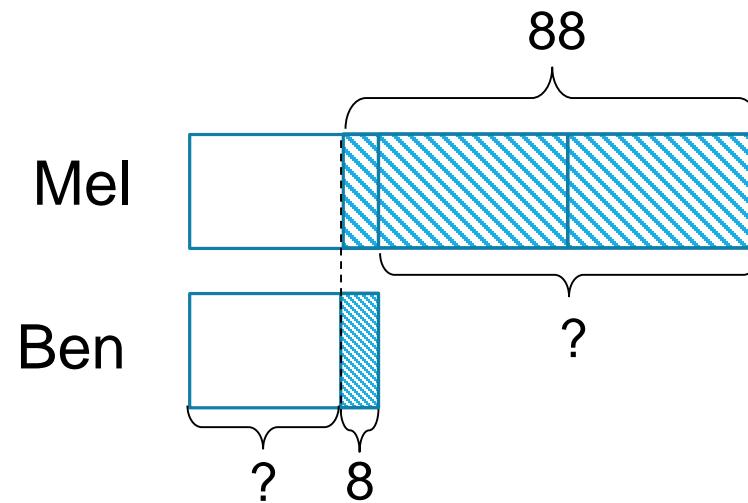
$$\begin{aligned}1 \text{ unit} &= 474 \div 3 \\&= 158\end{aligned}$$

$$\begin{aligned}2 \text{ units} &= 158 \times 2 \\&= \underline{316}\end{aligned}$$

Answer Statement

The biggest number is 316.

**Question 2:** 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?



**Answer Statement**

$$\begin{aligned}2 \text{ units} &= 88 - 8 \\&= 80 \\1 \text{ unit} &= 80 \div 2 \\&= 40 \\40 - 8 &= 32\end{aligned}$$

Each of them had 32 stickers in the end.

**Number Equation**

**Model**

# 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

- $20 - 5 = 15 + 3 = 18 \times 2 = 36$

- $1.5 = 90$

- 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

- $5000 = 5 \text{ km}$

# 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

**James has \$2900. He saves \$2360 and give the rest equally to his three children.  
How much money does each child receive?**

**Solution:**

Amount of money given to James's 3 children

$$= \$2900 - \$2360$$

$$= \$540$$

$$\$540 \div 3 = \$180$$

Each child receives **\$180**

**Intermediate statement**

**Number equation**

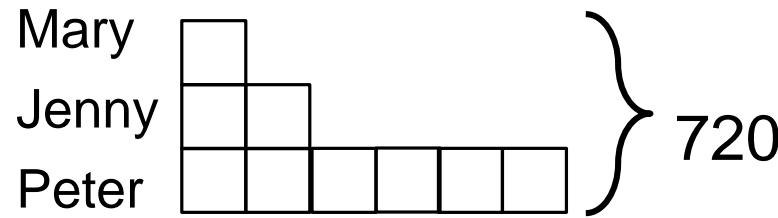
**Final Answer Statement**

**Unit**



**Let's  
Practise (2)**

**Question 1:** 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

$$9 \text{ units} = 720 \text{ stickers}$$

$$\begin{aligned}1 \text{ unit} &= (720 \div 9) \text{ stickers} \\&= 80 \text{ stickers}\end{aligned}$$

$$\begin{aligned}2 \text{ units} &= (80 \times 2) \text{ stickers} \\&= 160 \text{ stickers}\end{aligned}$$

Number Equation

Jenny has 160 stickers.

Answer Statement

**Question 2:** Mei Ling and Sabrina had the same number of flowers at first. After Mei Ling sold 144 flowers and Sabrina sold 62 flowers. Sabrina had 3 times as many flowers as Mei Ling. How many flowers did Sabrina have left?

$$2 \text{ units} = 144 - 62$$

$$= 82$$

$$1 \text{ unit} = 82 \div 2$$

$$= 41$$

$$3 \text{ units} = 41 \times 3$$

$$= 123$$

Sabrina had 123 flowers left.

### Number Equation

#### Before

Mei Ling  
Sabrina

#### After

Mei Ling  
Sabrina

### Model

Answer Statement

