Haig Girls' SCHOOL

Curriculum Briefing
P6 Mathematics

4 February 2022

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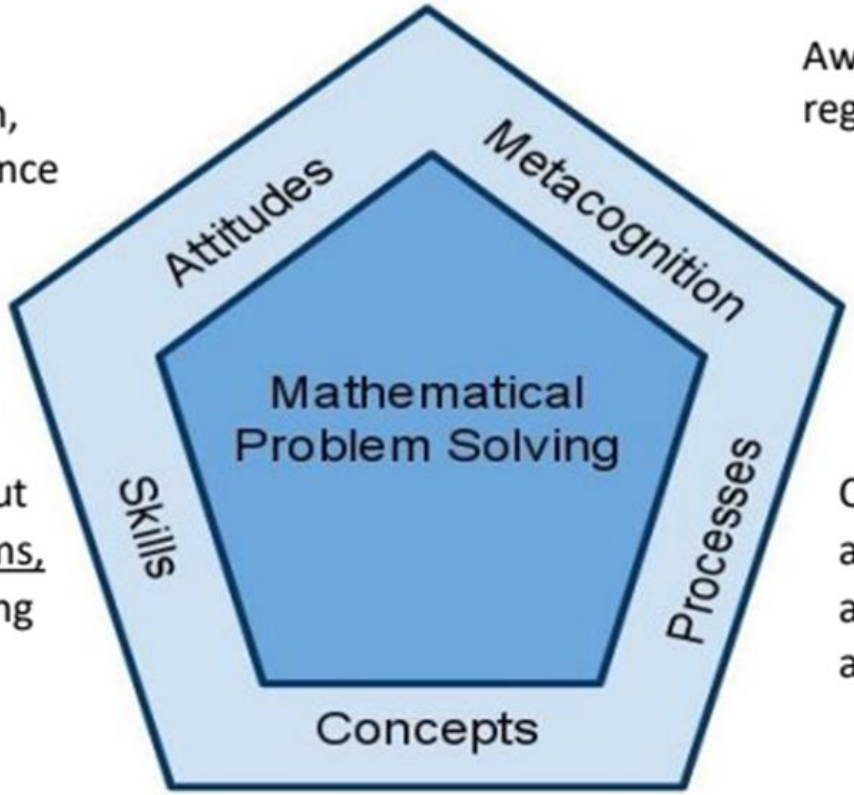
MOE MATHEMATICS CURRICULUM FRAMEWORK

Belief, appreciation, confidence, motivation, interest and perseverance

Awareness, monitoring and regulation of thought processes



Proficiency in carrying out operations and algorithms, visualising space, handling data and using mathematical tools

Competencies in abstracting and reasoning, representing and communicating, applying and modelling

Understanding of the properties and relationships, operations and algorithms

MOE, 2020

Primary 1	Primary 2 & 3	Primary 4	Primary 5	Primary 6
Whole Numbers	Whole Numbers	Whole Numbers	Whole Numbers	Whole Numbers
Measurement	Measurement	Measurement	Measurement	Measurement
Geometry	Geometry	Geometry	Geometry	Geometry
Data Analysis	Data Analysis	Data Analysis	Data Analysis	Data Analysis
	Fractions	Fractions	Fractions	Fractions
		Decimals	Decimals	Decimals
			Percentage	Percentage
			Ratio	Ratio
				Speed

Spiral Approach Math Curriculum

Content Strands in Mathematics Syllabus

- Numbers & Algebra
- Measurement & Geometry
- Statistics

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Topics under Numbers & Algebra

- Whole Numbers
- Fractions
- Ratio
- Decimals
- Percentage
- Rate and Speed
- Algebra

Topics under Measurement & Geometry

- Area and Perimeter
- Volume
- Angles
- Nets
- Triangles
- Quadrilaterals
- Circles

Topics under Statistics

- Average
- Tables and Line Graphs
- Pie Charts

Prelim and PSLE Exam Format

Paper	Item Type	Number of Questions	Number of Marks Per Question	Total Marks	Duration
1	Booklet A MCQ	10 5	1m 2m	10m 10m (20)	1 h No calculators
	Booklet B Short Answer Qns	5 10	1m 2m	5m 20m (25)	
About 1 hour Break					
2	Short Answer Qns	5	2m	10m	1h 30min The use of calculators is allowed.
	Structured / Long Answer Qns	12	3m 4m 5m	18m 12m 15m (45)	
	Total	47	-	100m	2h 30 min

PSLE Format

- Paper 2 allows pupils the use of calculators to solve problems.

- Only calculators that are approved by SEAB will be allowed for use in the examinations.

- The list of approved calculators is available on the SEAB website - http://www.seab.gov.sg

  Booklet on Instructions for PSLE candidates

Good Time Management is Important

Paper 1 (60 min)	30 Questions	Average Time spent for each Question	Time left for checking answers
		1.5 min (1.5 x 30 = 45)	15 min
		2 min (2 x 30 = 60)	No time to check!
Paper 2 (90 min)	**17 Questions**	**Average Time spent for each Question**	**Time left for checking answers**
		5 min (5 x 17 = 85)	5 min
		6 min (6 x 17 = 102)	No time to finish and check!

Assessment Objectives

Pupils should be able to

Recall mathematical facts, concepts, rules and formulae; perform straightforward computations (**AO1**)

Interpret information; understand and apply mathematical concepts and skills in a variety of context (**AO2**)

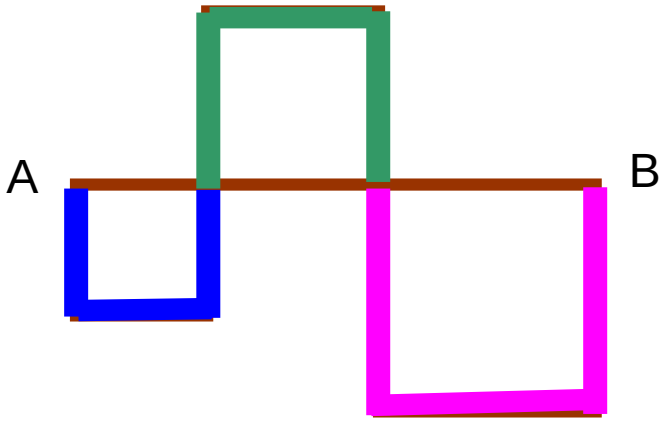
Reason mathematically; analyse information and make inferences; select appropriate strategies to solve problems (**AO3**)

Distribution of Assessment Objectives

AOs	Weighting
AO1	25%
AO2	40%
AO3	35%
Total	100%

EXAMPLES OF NON-ROUTINE PROBLEMS

The figure below is made up of 3 squares of different sizes. Line AB is a straight line, measuring 10 cm. Find the perimeter of the figure.



= 10 cm

Perimeter of the figure → 10 cm x 4

= 40 cm

PSLE MATH QUESTION

PAPER 1/B

Write down one decimal between 2.1 and 2.2

Ans: Accept any decimal greater than 2.1 but less than 2.2

eg. 2.11 (2 decimal places) or 2.154 (3 decimal places)

PSLE MATH QUESTION
PAPER 1/B

For a recycling project, Ali collected 17 bottles, Bala collected 2*m* bottles and Carl collected 2 + *m* bottles.

*Each of the statements below is **either true, false or not possible to tell** from the information given. For each statement, put a tick (√) to indicate your answer.*

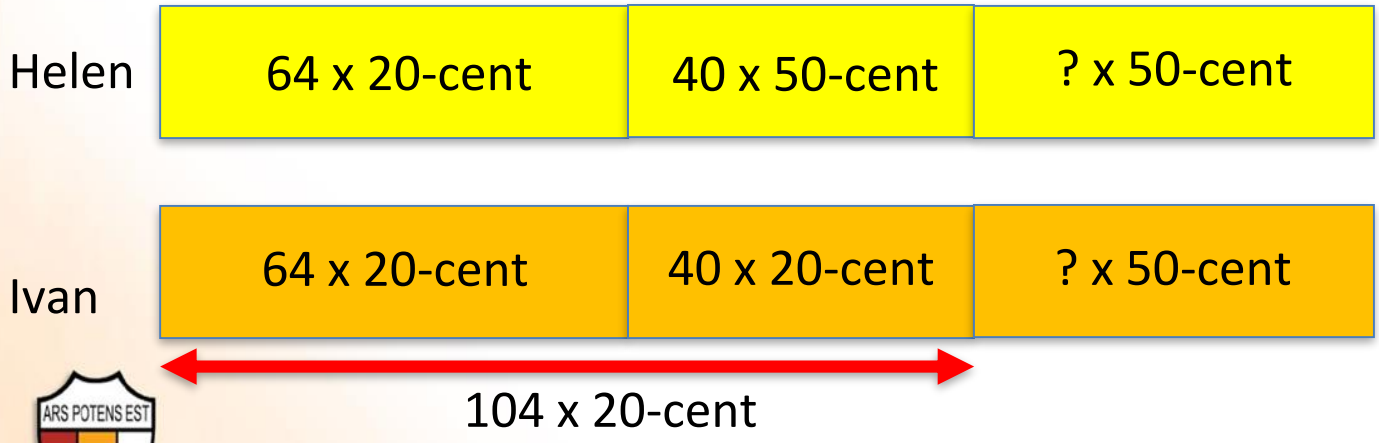
Statement	True	False	Not Possible to Tell
Ali collected the most number of bottles.			✓
Bala collected more bottles than Carl.			✓
The 3 boys collected 3*m* + 9 bottles altogether.	✓		

PSLE HELEN & IVAN COIN QUESTION

Helen and Ivan have the same total number of coins. Helen has a number of fifty-cent coins and 64 twenty-cent coins. The total mass of her coins is 1.134 kg. Ivan has a number of fifty-cent coins and 104 twenty-cent coins.

(a) Who has more money in coins? How much more?

(b) Each fifty-cent coin is 2.7 g heavier than each twenty-cent coin. What is the total mass of Ivan's coins in kg?



a) Helen has more money.

More → 40 x ($0.50 - $0.20) = $12

PSLE HELEN & IVAN COIN QUESTION

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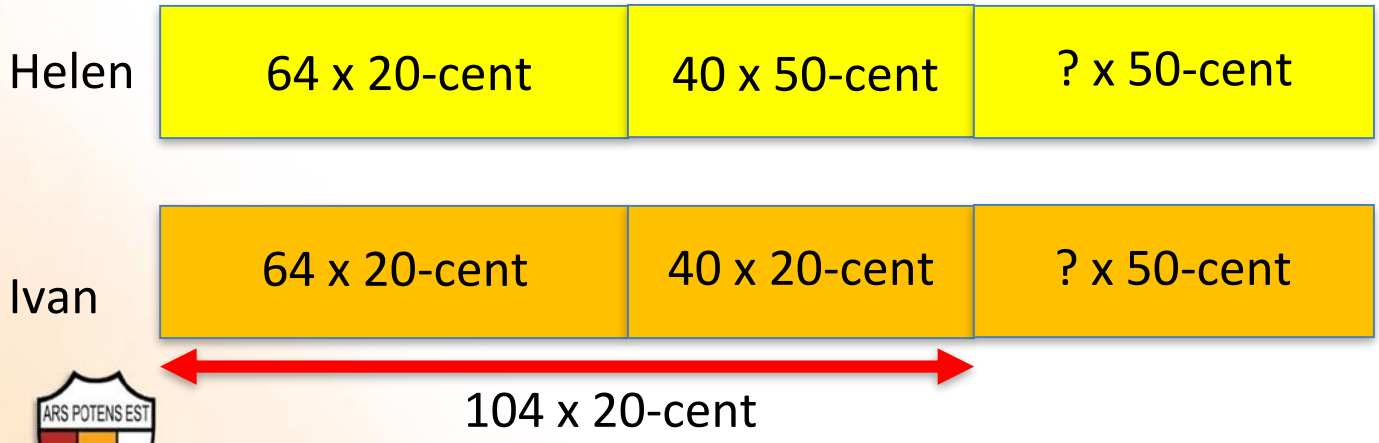

b) Difference in mass = 40 x 2.7 g = 108 g = 0.108 kg

Mass of Ivan's coins = 1.134 kg - 0.108 kg = 1.026 kg

3 TYPES OF COMMON ERRORS

CARELESS

Writing and Transferring the Wrong Number, Misread, Missing Units, Work Too Messy to Understand

COMPUTATIONAL

Adding, Subtracting, Multiplying or Dividing Incorrectly

CONCEPTUAL

Misunderstood Underlying Concepts

Have used Incorrect Logic

5 tips to help your child avoid making careless mistakes

1.Don't skip too many steps at once.

2.Check calculations and REVERSE-CHECK. ...

3.Use the correct units. ...

4. Time management. ...

5. Keeping the working neat.

COMMON ERRORS MADE BY STUDENTS

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ERROR #1:
Wrong Mathematical Statements

WRONG	CORRECT
$\frac{2}{7} = 14$	$\frac{2}{7} \rightarrow 14$
$\frac{1}{7} = 14 \div 2$ $= 7$	$\frac{1}{7} \rightarrow 14 \div 2$ $= 7$
$100\% = 30$	$100\% \rightarrow 30$
$1\% = 30 \div 100$ $= 0.3$	$1\% \rightarrow 30 \div 100$ $= 0.3$

ERROR #2:
Not converting the units before calculating

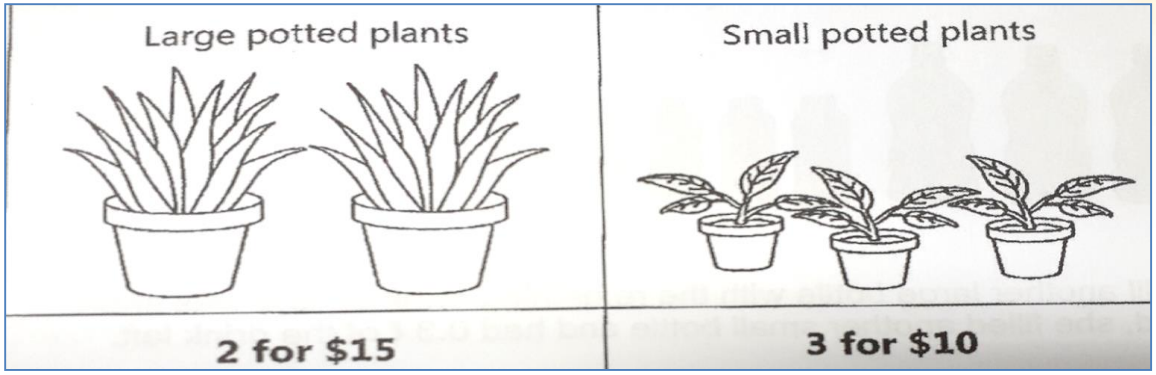
4.5 kg + 4000 g = 4004.5 kg

Correct Working

4500 g + 4000 g = 8500 g

ERROR #3:
Not stating the explanation for working steps

Peiyi and Jamal bought potted plants at the prices shown below.



Peiyi bought an equal number of large and small potted plants. She spent $175 **more** on the large ones. How many potted plants did she buy altogether?

PUPIL'S WORKING

$15 x 3 = $45
$10 x 2 = $20
$45 - $20 = $25
175 ÷ 25 = 7
7 x 6 = 42
2 x 42 = 84

state explanation for working

6 large plants → $15 x 3
= $45
6 small plants → $10 x 2
= $20
Difference → $45 - $20
= $25
No. of sets of $25 → 175 ÷ 25
= 7
No. large plants → 7 x 6 = 42
Total plants → 2 x 42 = 84

ERROR #4:

Not applying the right method for the topic

A movie started at 11.45 a.m. The movie was 2 hours and 25 minutes long. What time did the movie end?

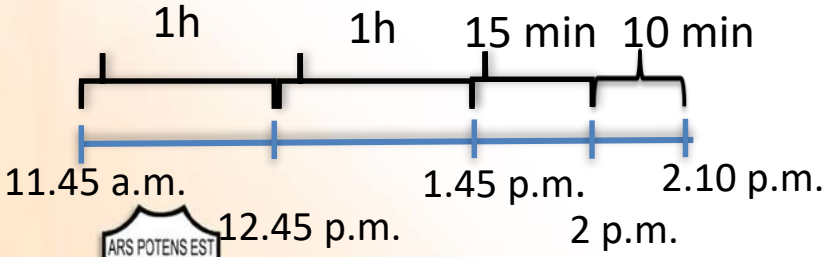
11.45 + 2h 25 min = 2.10 p.m.

\+ 2.25

11.45

13.70

CORRECT WORKING METHOD



2h 25 min

\+ 1h 10 min

3h 40 min

Acceptable when working out duration of time

Using a Time Line

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ERROR #5: Misconception

- Mrs Tan sold $\frac{1}{4}$ of the cookies in the morning and $\frac{3}{5}$ of the remainder in the afternoon. She had 48 cookies left. How many cookies did she bake?

PUPIL'S WORKING	CORRECT WORKING
$\frac{1}{4} + \frac{3}{5} = \frac{17}{20}$ (this is wrong as she assumes that $\frac{3}{5}$ is out of the total number of cookies in the afternoon) $\frac{3}{20} \rightarrow 48$ $\frac{20}{20} \rightarrow 320$ ✗	Morning $\rightarrow \frac{1}{4}$ Remainder $\rightarrow \frac{3}{4}$ Afternoon $\rightarrow \frac{3}{5} \times \frac{3}{4} = \frac{9}{20}$ Total sold $\rightarrow \frac{1}{4} + \frac{9}{20} = \frac{14}{20}$ Left $\rightarrow 1 - \frac{14}{20} = \frac{6}{20}$ 6 units = 48 20 units = $\frac{48}{6} \times 20 = 160$ ✓

Ways to Prevent and Correct Conceptual Errors

- Introduce concepts in conceptual way
- Teach a concept more than one way
- Analysing Errors
- Engage in Math Talk

Analysing Errors

Spot the Mistakes

(b) In the morning, the temperature in a garden was 28°C. In the afternoon, the temperature increased to 34°C. What was the percentage increase in the temperature? Give your answer correct to 1 decimal place.

Aden's working:
Increase in temperature = 34 − 28
= 6°C

$\frac{6}{34} \times 100\% = 17.6\%$ (correct to 1 decimal place)

The percentage increase in the temperature was 17.6%.

Explanation

Correct solution

Template to Minimise Errors

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Template to Help Minimise Errors

Name:_____ Date:_____

Class:_____ Assignment:_____

Type of Errors / Question No.	Why Errors were made	Suggestions or Strategies to minimise errors

Haig Girls' Math Talk

Explain

I solved this problem by…

I agree or disagree because …

I know the answer is … because …

Evaluate

Why did you choose this strategy?

My strategy is similar/different because …

How do you know your answer is right?

Extend

How is this like other problems you have solved?

Is there another way you can solve this?

I still have a question about …

Common codes used during marking of Math questions/word problems

Codes	Representations
CC	Careless calculation (method is correct)
MC	Missing captions/ sentence tags
ME	Missing equation
MR	Misread (From question to solution)
MU	Missing unit
TE	Transfer error (within solution or from solution to answer blank)
WM	Wrong method
WMS	Wrong mathematical statement
WU	Wrong unit

Polya's 4-step Approach to Problem Solving

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Mathematical Problem Solving Process

- **C** — **Circle** the numbers
- **U** — **Underline** the keywords
- **B** — **Box** the question
- **E** — **Explain** and Annotate

Choose a Strategy/Heuristics

- Model Method
- Find a Pattern
- Make a List
- Working Backwards
- Guess and Check

- Write number equations clearly
- Add, subtract, multiply, divide
- Use mathematical tools such as calculator, ruler, protractor and set-squares
- Apply formula

- Have I answered the question?
- **S** : Standard Units of Measurement
- **T** : Transfer Error
- **A** : Accuracy
- **R** : Reasonableness
- Is there another way I can solve and check my answer?

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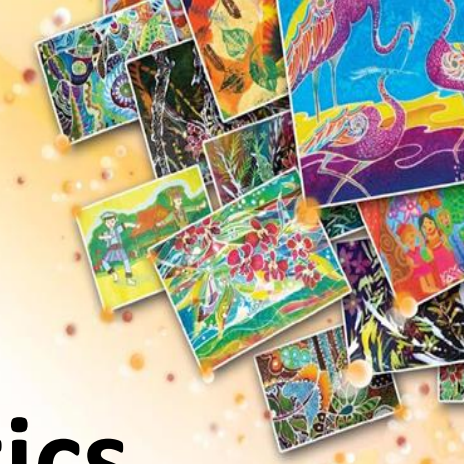

Problem Solving Heuristics
are general methods or strategies of achieving a solution to a given problem.

Problem Solving Heuristics

Commonly used:

- Draw a model or diagram
- Make a systematic list/ tabulation
- Use before / after concept
- Look for a pattern
- Guess and Check
- Supposition
- Working Backwards
- Algebraic method

How do we support your child…

- Review topics from P3 to P5 and teach new topics such as Algebra, Circles , Speed, Nets and Pie Charts
- Practise PSLE exam – type questions and other schools exam papers
- Apply various heuristics to solve non-routine questions
- Learn techniques for checking answers eg. check for reasonableness and working backwards

How do we support your child…

- Pupils to analyse and reflect on how to apply the most efficient methods and to avoid common errors
- Practise good time management, neat presentation of solutions and learn tips on stress management
- Develop content mastery through topical worksheets, questioning and feedback
- Consolidate and revise concepts and key topics via topical notes handout, mock paper practices

Learning Study Skills

- Active listening
- Notetaking
- Stress management
- Time management
- Test taking
- Memorization

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Pupils are expected to

1. be attentive during lessons

2. complete and hand in work on time

3. present solutions in an organised way, showing all working steps and standard units of measurement

4. go through their answers and check them carefully

5. find out the reason behind each mistake made and do their corrections

6. seek help from teacher to clarify any doubts

Support from Parents

1. **<u>Time management</u>** – help to administer each revision Paper 1 and Paper 2 by setting a time limit.
2. To ensure no calculators is used in daily work unless calculator symbol is indicated.
3. Talk about Math as used in day-to-day situation.
4. If your child/ward has difficulty with her homework, **<u>do not</u>** be too quick to give her the answers but guide her with questions and indicate on the homework 'assisted' or 'guided'.
5. Encourage your child and affirm her effort and improvement made.

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