

Outline of workshop:

Time (am)	Activities	
0900 - 0940	Welcome	
	Sharing on STAR strategy	
	Advanced Model Drawing	
0940 - 0945	Break (5 min)	-
0945 - 1020	Guess and Check/ Supposition/ Set Method	•
	Math Around Us/ Koobits	F
1020 - 1030	Q & A (10 min)	



Go on. Try these steps to solve math problems! They really help!

STAR approach

 $\underline{\mathbf{S}}$ tudy the problem.

- What is the important information given?
- How can I connect, link or organise the information?

<u>**T**</u>hink of a plan.

- What is the missing information I need to find?
- What strategies should I use to find the missing information?



STAR approach

 $\underline{\mathbf{A}}$ ct on the plan.

- How do I solve the problem?
- Does each step makes sense?

Reflect on solution.

- How do I know if I had answered the problem?



Advanced Model Drawing

Let's Try Together: Question 1

Joyce, Ken and Brandon sold some tickets. Joyce sold $\frac{1}{10}$ of the tickets. Ken sold 6 more tickets than Joyce. Brandon sold 82 tickets. Find number of tickets Ken sold.

Let's Try Together: Question 1 STUDY THE PROBLEM

Joyce, Ken and Brandon sold some tickets. Joyce sold $\frac{1}{10}$ of the tickets. Ken sold 6 more tickets than Joyce. Brandon sold 82 tickets. Find number of tickets Ken sold.



WHAT'S NEXT?

THINKOFA



Model Drawing!

ACT ON THE PLAN

Joyce									
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Let's Try Together: Question 1 REFLECT ON THE SOLUTION Joyce, Ken and Brandon sold some tickets. Joyce sold of the tickets. Ken sold 6 more tickets than Joyce. Brandon sold 82 tickets. Find number of tickets Ken sold. Ken $\rightarrow 17$ Brandon -> 110 - 17 - 11 = 82 Joyce $\rightarrow 17 - 6 = 11$ Total -> $11 \times 10 = 110$

Now You Try! Question 2

Chloe paid \$410 for 3 bags and 8 shirts. A bag costs 4 times as much as a shirt. Find the cost of each bag.

Now You Try! Question 2 STUDY THE PROBLEM

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Now You Try! Question 2 STUDY THE PROBLEM

Chloe paid <u>\$410 for 3 bags and 8 shirts</u>. A <u>bag</u> costs <u>4 times</u> as much as a <u>shirt</u>. Find the <u>cost</u> of <u>each bag</u>.

Now You Try! Question 2 THINK OF A PLAN

Chloe paid <u>\$410 for 3 bags and 8 shirts</u>. A <u>bag</u> costs <u>4 times</u> as much as a <u>shirt</u>. Find the <u>cost</u> of <u>each bag</u>.

MODEL DRAWING

Now You Try! Question 2 ACT ON THE PLAN

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 $3 \times 4 \text{ units} + 1 \times 8 \text{ units} = 20 \text{ units}$ 20 units = \$410 $1 \text{ units} = $410 \div 20$ = \$20.50 $4 \text{ units} = 20.50×4 = \$82The bag cost <u>\$82</u>.

Now You Try! Question 2 REFLECT ON THE SOLUTION

Chloe paid <u>\$410 for 3 bags and 8 shirts</u>. A <u>bag</u> costs <u>4 times</u> as much as a <u>shirt</u>. Find the <u>cost</u> of <u>each bag</u>.

Bag -> \$2 3 bags + 8 shirts -> 3 x \$2 + 8 x \$20.50= \$410= \$20.50

Now You Try: Question 3

A container full of oil has a mass of 54 kg. When the same container is $\frac{3}{5}$ filled with oil, it has a mass of 38 kg. What is the mass of the empty container?

Now You Try: Question 3 STUDY THE PROBLEM

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Now You Try: Question 3 STUDY THE PROBLEM

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Now You Try: Question 3 THINK OF A PLAN A container full of oil has a mass of 54 kg. When the same container is $\frac{3}{5}$ filled with oil, it has a mass of 38 kg. What is the mass of the empty container?

MODEL DRAWING





Now You Try: Question 3 REFLECT ON THE SOLUTION A container full of oil has a mass of 54 kg. When the same container is $\frac{3}{5}$ filled with oil, it has a mass of 38 kg. What is the mass of the empty container? $\frac{3}{7}$ of Oil + container -> 24 kg + 14 kg Container -> 14 kg Oil -> 54 kg - 14 kg = 40 kg $\frac{3}{5}$ of Oil -> $\frac{3}{5}$ x 40 kg = 38 kg= 24 kg



Guess and Check

Supposition Set Method

Let's Try Together: Question 4

Mrs Tan had a total of \$160, consisting of \$10 and \$2 notes. Given that she had 3 times as many \$2 notes as \$10 notes, how many \$2 notes and \$10 notes did she have?

Let's Try Together: Question 4 STUDY THE PROBLEM

Mrs Tan had a total of \$160, consisting of \$10 and \$2 notes. Given that she had 3 times as many \$2 notes as \$10 notes, how many \$2 notes and how many \$10 notes did she have?

Let's Try Together: Question 4 STUDY THE PROBLEM

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Let's Try Together: Question 4 THINK OF A PLAN

Mrs Tan had a total of \$160, consisting of <u>\$10 and \$2 notes</u>. Given that she had <u>3 times as many \$2 notes as \$10 notes, how</u> <u>many \$2 notes and how many \$10 notes</u> did she have?

> GUESS AND CHECK/ SET METHOD

ACT ON THE PLAN

Method 1: Guess and Check

No. of \$2 notes	Value of \$2	No. of \$10 notes	Value of \$10	Total Value (\$2 and \$10)	Check (\$160)
	x \$2=		x \$10 =	+ =	

ACT ON THE PLAN

Method 1: Guess and Check

No. of \$2 notes	Value of \$2	No. of \$10 notes	Value of \$10	Total Value (\$2 and \$10)	Check (\$160)
	x \$2=		x \$10 =	+ =	

She had <u>**30</u>** \$2 notes and <u>**10**</u> \$10 notes.</u>

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Method 2: Set Method
2 \times 3 = 6
1 set of 3 $2 notes and 1 $10 notes \rightarrow $6 + $10= $16
Number of sets \rightarrow $160 ÷ $16
                                       REFLECT ON
              = 10
Number of $2 notes \rightarrow 10 x 3
                                    THE SOLUTION
                  = 30
Number of $10 notes \rightarrow 10
She had 30 $2 notes and 10 $10 notes.
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Now You Try: Question 5

A tricycle has 3 wheels while a bicycle has 2 wheels. There are 27 bicycles and tricycles altogether in the shop. The number of tricycles' wheels is 41 more than that of the bicycles. How many bicycles and tricycles are there in the shop?

Now You Try: Question 5

A tricycle has 3 wheels while a bicycle has 2 wheels. There are 27 bicycles and tricycles altogether in the shop. The number of tricycles' wheels is 41 more than that of the bicycles. How many bicycles and tricycles are there in the shop?

Now You Try: Question 5 STUDY THE PROBLEM

A <u>tricycle has 3 wheels</u> while a <u>bicycle has 2 wheels</u>. There are <u>27 bicycles and tricycles altogether</u> in the shop. The <u>number</u> <u>of tricycles' wheels</u> is <u>41 more than</u> that of the <u>bicycles</u>. <u>How</u> <u>many bicycles and tricycles</u> are there in the shop?

ACT ON THE PLAN

Method 1: Guess and Check

No. of Bicycles	Bicycles (2 wheels)	No. of Tricycles	Tricycles (3 wheels)	Difference in wheels (Bicycles and Tricycles)	Check (41 more)

ACT ON THE PLAN

Method 1: Guess and Check

No. of Bicycles	Bicycles (2 wheels)	No. of Tricycles	Tricycles (3 wheels)	wheels (Bicycles and Tricycles)	Check (41 more)

Method 2: Make a Supposition

Let's assume all are tricycles,

 $27 \ge 3 = 81$ 81 - 0 = 8181 - 41 = 40

REFLECT ON THE SOLUTION

Each time a tricycle is changed to a bicycle, the difference is reduced by, 3 + 2 = 5

 $40 \div 5 = 8$

27 - 8 = 19

There are <u>8</u> bicycles and <u>19</u> tricycles in the shop.





Parent Involvement

Motivation and support:

Affirm your child's effort in learning Mathematics Encourage your child to persevere and be selfdirected in their learning of Mathematics.

Be Present:

- Show interest in their learning through regular chats with them.
- Encourage alternative solutions (possible)
- Learn together with your child.
- Let your child verbalise their solutions to questions.

Making connections:

Seize opportunities to relate Math to the real world.

Math Around Us

• <u>https://www.youtube.com/watch?v=GXIhFHKjLC4</u>







Whole Numbers



- Exploring large numbers up to 10 million
- Populations in different countries
- Housing Property Prices
- Capacity of large stadiums

nese stadiums are run by the	Singapore Sports	Council.		
Stadium ÷	Location ÷	Seating Capacity ÷	Ref. ÷	
edok Stadium	Bedok	38,864		
han Stadium	Bishan	65,000		
it Gombak Stadium	Bukit Batok	52,000		
oa Chu Kang Stadium	Choa Chu Kang	35,000		
menti Stadium	Clementi	65,000		
an Besar Stadium	Kallang	52,000		
ong East Stadium	Jurong East	38,700		
ong West Stadium	Jurong West	36,000		
lang Stadium	Kallang	65,000		
rina Bay Floating Platform	Marina Bay	30,000		
ntfort Stadium	Hougang	60,000		
nggol Stadium	Punggol	62,200		
enstown Stadium	Queenstown	39,800		
ngkang Stadium	Sengkang	63,000		
angoon Stadium	Serangoon	57,200		
gapore Indoor Stadium	Kallang	65,000		
pines Olympic Stadium	Tampines	90,000		
Payoh Stadium	Toa Payoh	50,000		
odlands Stadium	Woodlands	58,000		
Chu Kang Stadium	Ang Mo Kio	25,000		
un Stadium	Vichup	72.400		

MATH IN DAILY LIFE









Problem Solving

- Problem solving skills is the ability to use Mathematics to solve problems.
- Not all problems that they encounter in life will be routine and familiar. Students must learn problem-solving strategies and ways of thinking and approaching a problem.
- Use of **STAR strategy** is a useful framework for students to know and use in solving problem sums.

Alternative Solutions

- Alternative Solutions involves Critical and Creative Thinking.
- **Critical Thinking** is thinking that examines, relates and evaluates all aspects of the situation or problem. It is **analytical and reflexive in nature**.
- Creative Thinking is thinking that is original and reflective and is the ability to make decisions in producing a new, complex end product. It includes synthesizing ideas, generating new ideas and determining ideas.
- **Connections** refer to the **ability to see and make linkages** among Mathematical ideas, between Mathematics and other subjects, and between Mathematics and everyday Life. This helps students **make sense** of what they learn in Mathematics.

Communication and Reasoning

- Mathematical Communication refers to the ability to use mathematical language to express mathematical ideas and arguments precisely, concisely and logically. It helps students develop their own understanding of Mathematics and sharpens their Mathematical thinking.
- Mathematical Reasoning refers to the ability to analyse Mathematical situations and construct logical arguments. It is a habit of mind that can be developed through the application of Mathematics in different situations and contexts.

Communication and Reasoning

- Students need to **justify their answers orally and in written work clearly**. If they need help, they can be given scaffolds to help them formulate their responses or explanations to promote understanding.
- Students need to be **exposed to problems in real- world contexts**. They can formulate and check on the reasonableness of their answers.
- Students need to reflect on their problem-solving process and explain this process to one another so as to develop their metacognition. Students need to model their thinking process by thinking aloud and constantly monitor and reflect on their thinking process.

Attitudes

- In order to develop and enhance confidence and motivation in the learning of Mathematics in students, students **must first experience success, no matter how small and then they will feel competent.**
- Students must appreciate and see the value and relevance of Mathematics to their everyday life and in the real world.
- Students need to **work on solving problems regularly** using various mathematical strategies and be actively engaged in the problem solving processes.

Koobits

- Koobits is an ICT Mathematics platform that provides students with ICT tools to understand Mathematical concepts through visualisations, simulations and representations via a variety of graded questions, videos and quizzes.
- Koobits supports exploration, experimentation and extend the range of problems to the students as part of self-directed learning.
- Students can communicate and collaborate as part of knowledge building process.
- **Teachers and parents** can **assess students' learning and provide feedback** to students in a timely manner.

Some Useful Tips (Parental Involvement)

- Encourage your child to persevere.
- Use role play or manipulatives and simple numbers to explain.
- Give feedback immediately.
- Master the problem- solving skills.
- Do not be afraid of making mistakes.
- Learn from the mistakes.

- Encourage and support your child to seek alternative methods.
- Reinforce in every child a strong belief in him/her self.
- Be patient, work out the questions together with your children.



Summary

- STAR Strategy
- Advanced Model Drawing
- Guess and Check, Supposition, Set Method
- Math Around Us
- Koobits

