MATHS ALIVE! WORKSHOP FOR PARENTS

8 APRIL 2022

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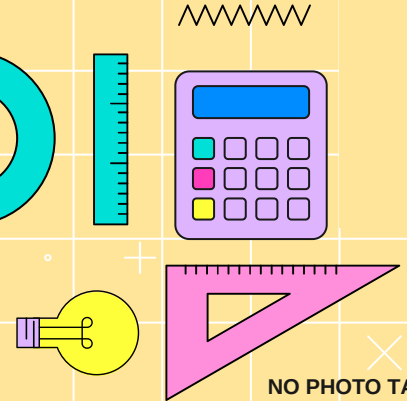

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OBJECTIVES

- To see how mathematics is connected to everyday life.
- To introduce strategies used to solve word problems.

CONTENTS OF WORKSHOP

1. Introduction to Mathematics Curriculum Framework
2. Introduction to Heuristics Word Problems
    - Guess and Check
    - Restate the Problem
3. Problems connected to everyday life
    - Rate of Charges
    - Percentage
    - Shortage and Excess

Introduction to the Mathematics Curriculum Framework

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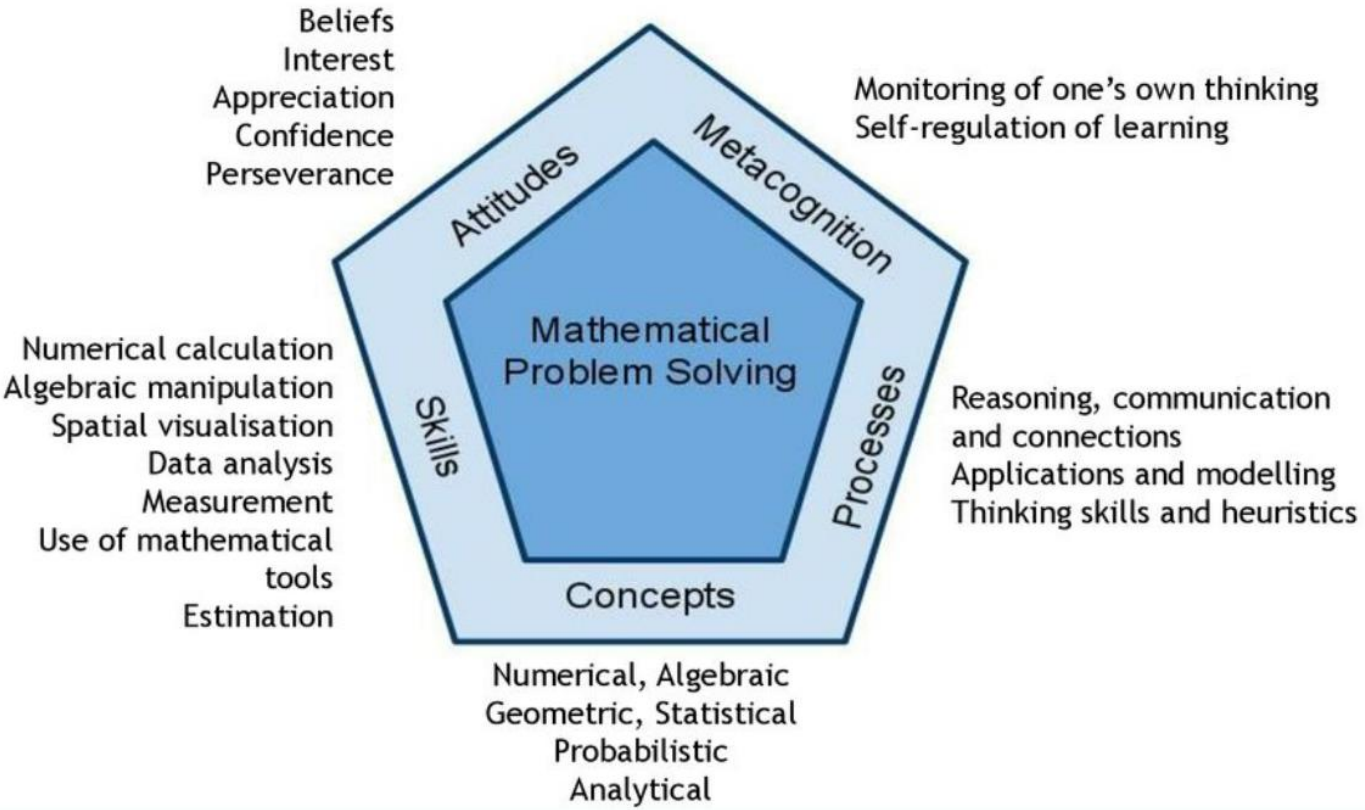
Mathematics Curriculum Framework



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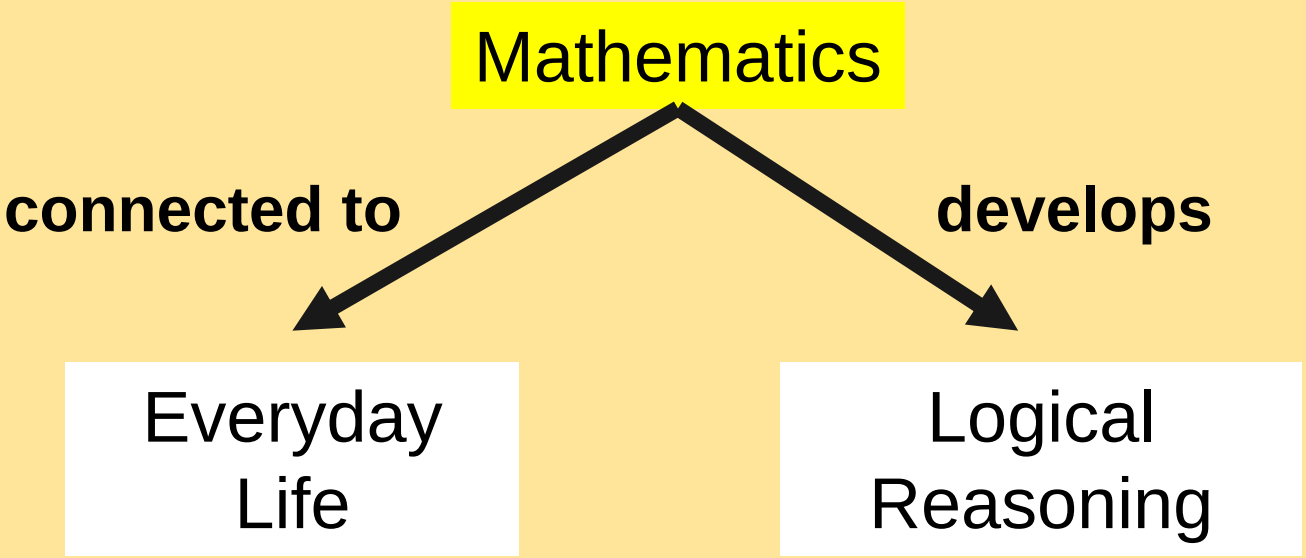
AIMS AND FRAMEWORK OF MATHEMATICS

Mathematics education aims to enable students to:

- **acquire the necessary mathematical concepts and skills for everyday life,**
- **develop the necessary process skills for the acquisition and application of mathematical concepts and skills.**
- **develop the mathematical thinking and problem solving skills and apply these skills to formulate and solve problems.**
- **recognise and use connections among mathematical ideas, and between mathematics and other disciplines.**
- **develop positive attitudes towards mathematics.**



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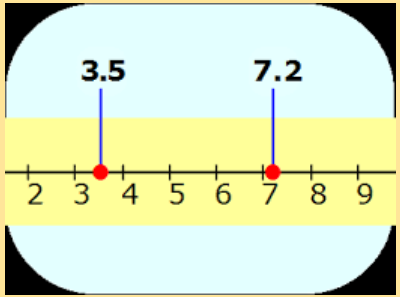
NUMBER AND ALGEBRA

- Students learning about **whole numbers, fractions** and **decimals** and use their knowledge in everyday situations. Word problems provide students with opportunity to apply mathematics concepts and skills in everyday situations



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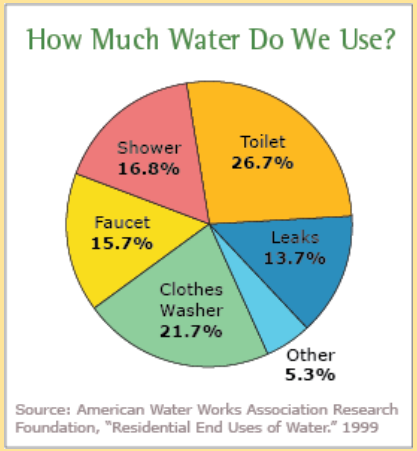
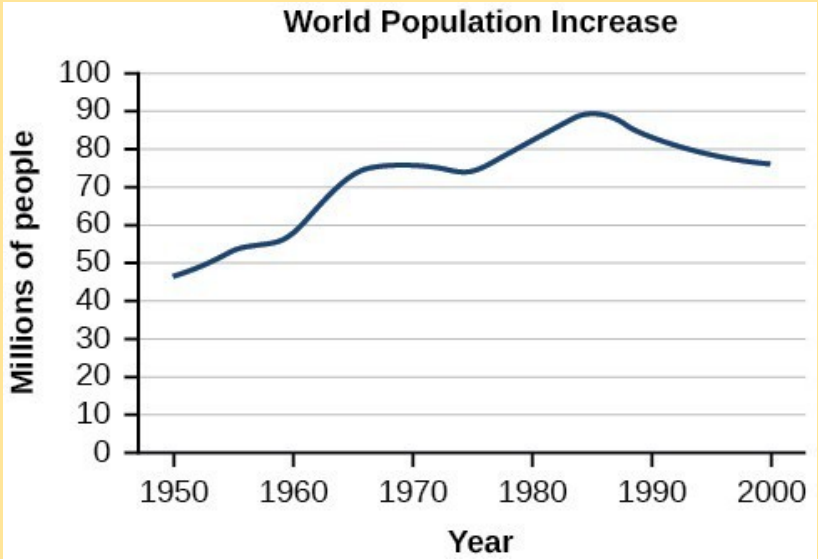
MEASUREMENT AND GEOMETRY

- Students learn about **length, mass, area, volume, time**. This helps them develop **skills of measuring** and see the relevance in everyday situations.

STATISTICS

Students learn the methods and tools to analyse and **interpret data in graphs** and **pie charts** so that the useful information can be used for decision making and understanding a situation. This is a practical aspect of mathematics that is **relevant to everyday life** and situations.





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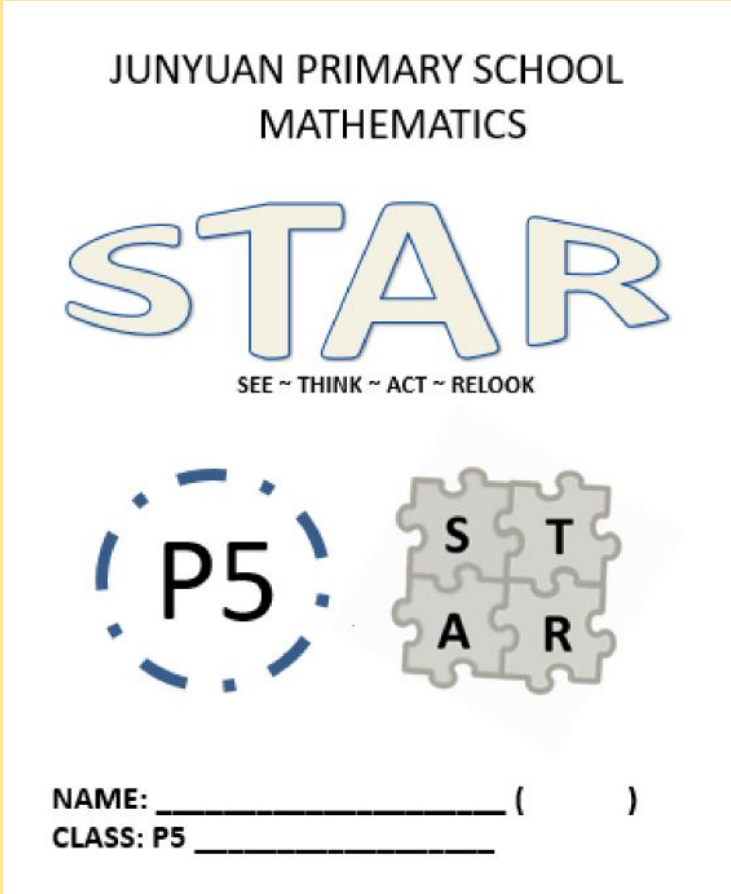
STRATEGY

- STAR approach
  - **S** ee what is given
  - **T** hink of a plan
  - **A** ct on my plan
  - **R** elook and check



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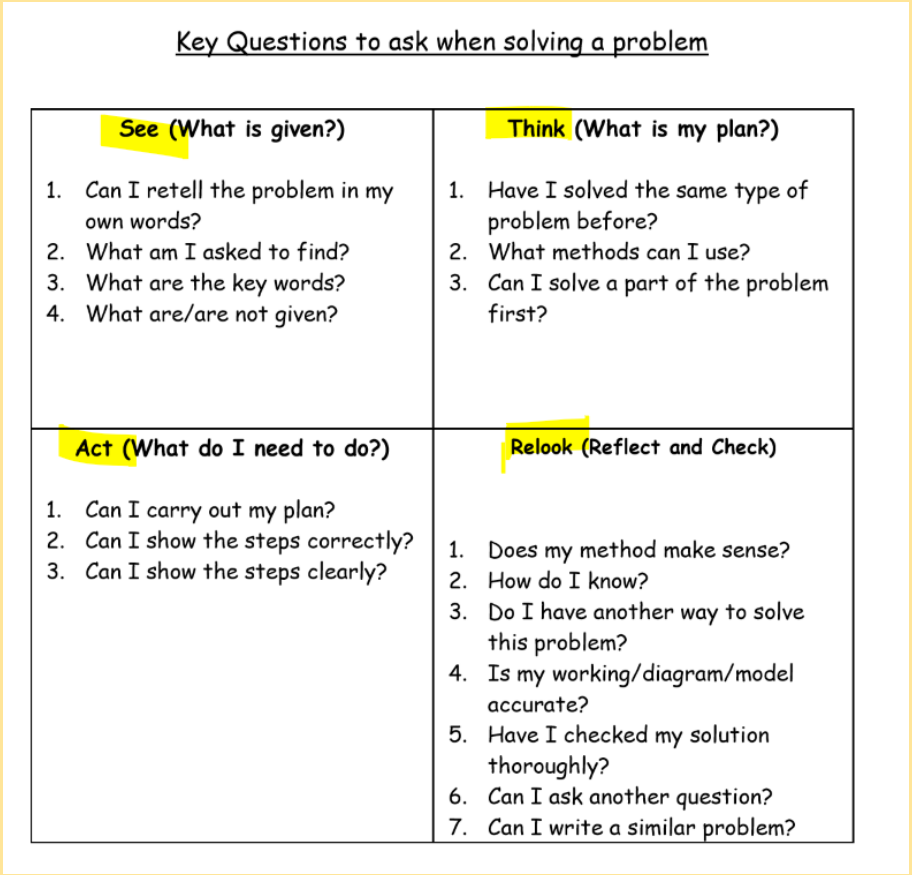

Key Questions to ask when solving a problem

See (What is given?)	Think (What is my plan?)
1. Can I retell the problem in my own words? 2. What am I asked to find? 3. What are the key words? 4. What are/are not given?	1. Have I solved the same type of problem before? 2. What methods can I use? 3. Can I solve a part of the problem first?
Act (What do I need to do?)	**Relook (Reflect and Check)**
1. Can I carry out my plan? 2. Can I show the steps correctly? 3. Can I show the steps clearly?	1. Does my method make sense? 2. How do I know? 3. Do I have another way to solve this problem? 4. Is my working/diagram/model accurate? 5. Have I checked my solution thoroughly? 6. Can I ask another question? 7. Can I write a similar problem?

STRATEGY

- STAR approach
  - **S** ee what is given
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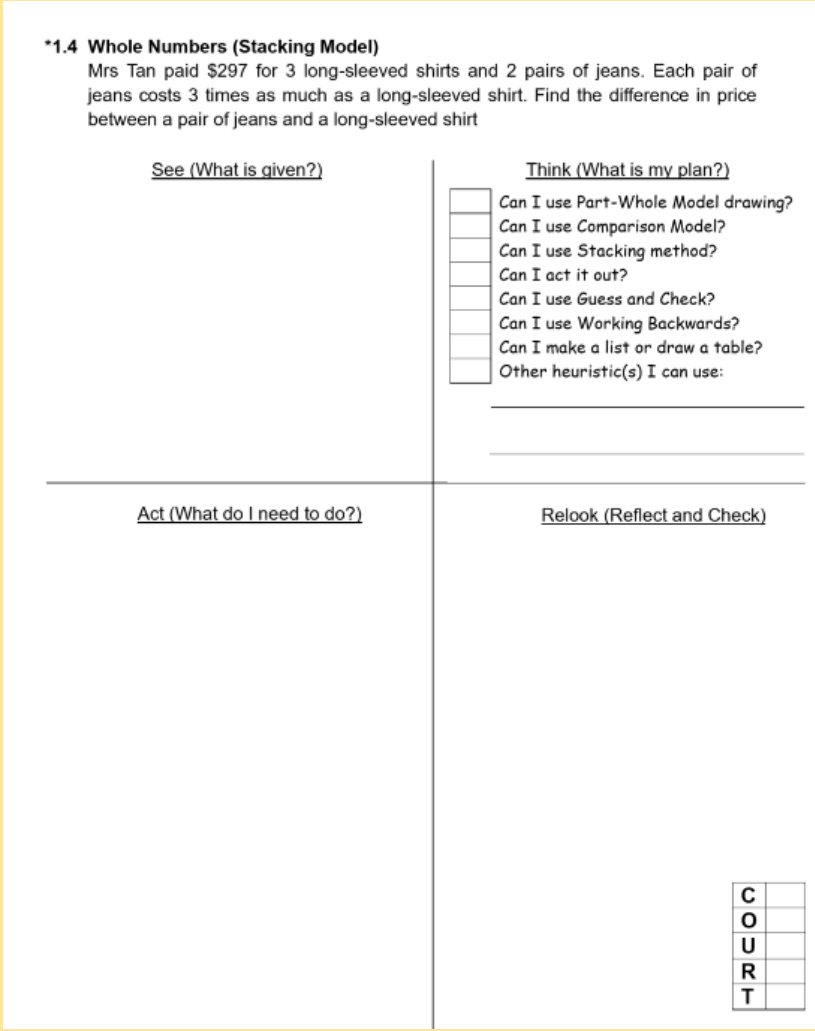

*1.4 **Whole Numbers (Stacking Model)**

Mrs Tan paid $297 for 3 long-sleeved shirts and 2 pairs of jeans. Each pair of jeans costs 3 times as much as a long-sleeved shirt. Find the difference in price between a pair of jeans and a long-sleeved shirt

See (What is given?)

Think (What is my plan?)

- ☐ Can I use Part-Whole Model drawing?
- ☐ Can I use Comparison Model?
- ☐ Can I use Stacking method?
- ☐ Can I act it out?
- ☐ Can I use Guess and Check?
- ☐ Can I use Working Backwards?
- ☐ Can I make a list or draw a table?
- ☐ Other heuristic(s) I can use:

Act (What do I need to do?)

Relook (Reflect and Check)

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Introduction to Heuristics Word Problems

GUESS AND CHECK

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GUESS & CHECK

QUESTION 1:

John bought a total of 20 oranges and apples for $9.40. Each orange cost 40 cents and each apple cost 60 cents. How many oranges did he buy?

Question 1: Guess & Check

John bought a total of 20 oranges and apples for $9.40. Each orange cost 40 cents and each apple cost 60 cents. How many oranges did he buy?

No. of oranges	Cost of oranges (40 cents)	No. of apples	Cost of apples (60 cents)	Total Cost	Check ($9.40)

Answer : 13 oranges

GUESS & CHECK

QUESTION 2:

In a test, there were a total of 40 questions.
For every question answered correctly, a student was awarded 4 points.
For each question answered wrongly, 1 point was deducted.
If Anna scored 130 points, how many questions did she answer wrongly?

Question 2: Guess & Check

In a test, there were a total of 40 questions. For every question answered correctly, a student was awarded 4 points. For each question answered wrongly, 1 point was deducted. If Anna scored 130 points, how many questions did she answer wrongly?

Correct answers	Marks awarded	Wrong answers	Marks deducted	Total marks	Check (130 points)

Answer : 6 wrong answers

Introduction to Heuristics Word Problems

RESTATE THE PROBLEM

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RESTATE THE PROBLEM

QUESTION 1:

The total cost of 2 tables and 5 chairs is $2110.50. The total cost of 3 tables and 6 chairs is $2814. What is the cost of 1 chair?

QUESTION 1: Restate the Problem

The total cost of 2 tables and 5 chairs is $2110.50. The total cost of 3 tables and 6 chairs is $2814. What is the cost of 1 chair?

2T + 5C → $2110.50

3T + 6C → $2814

1T + 1C → $2814 - $2110.50 = $703.50

3T + 3C → $703.50 x 3 = $2110.50

3C → $2814 - $2110.50 = $703.50

1 C → $703.50 ÷ 3 = $234.50

The cost of 1 chair is **$234.50**.

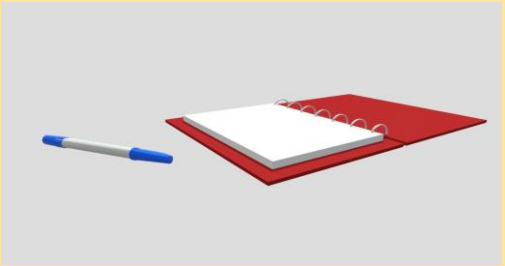
RESTATE THE PROBLEM

QUESTION 2:

4 pens and 7 exercise books cost $43.
4 pens and 3 exercise books cost $23.
Find the cost of 1 pen.

QUESTION 2: Restate the Problem

4 pens and 7 exercise books cost $43. 4 pens and 3 exercise books cost $23. Find the cost of 1 pen.



4P + 7E → $43

4P + 3E → $23

4E → $43 - $23 = $20

1E → $20 ÷ 4 = $5

3E → $5 x 3 = $15

4P → $23 - $15 = $8

1P → $8 ÷ 4 = $2

The cost of 1 pen is **$2**.

OR

7E → $5 x 7 = $35

4P → $43 - $35 = $8

1P → $8 ÷ 4 = $2

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Problems connected to everyday life

RATE OF CHARGES

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RATE OF CHARGES

Question 1:
The table shows the rental rates for bicycles.

Bicycle Rental Rates	
For the first hour	$2.00
For every additional $\frac{1}{2}$ hour	$0.90

Jack wants to rent a bicycle from 2.30 p.m. to 5.00 p.m. How much will he have to pay?

QUESTION 1: Rate of Charges

The table shows the rental rates for bicycles. Jack wants to rent a bicycle from 2.30 p.m. to 5.00 p.m. How much will he have to pay?

Bicycle Rental Rates	
For the first hour	$2.00
For every additional $\frac{1}{2}$ hour	$0.90

2.30 p.m. - 3.30 p.m. – First hour → $2

3.30 p.m. – 4 p.m. → $0.90

4 p.m. – 4.30 p.m. → $0.90

4.30 p.m. – 5.00 p.m. →$0.90

$2 + 3 x $0.90 = **$4.70**

He has to pay $4.70

RATE OF CHARGES

Question 2:
The table shows the parking charges at a carpark.

Car Park Charges	
For the first hour	$2.50
For every additional $\frac{1}{2}$ hour	$0.80

Mr Tan parks his car from 11.30 a.m. to 2.00 p.m.
How much will he have to pay?

QUESTION 2: Rate of Charges

The table shows the parking charges at a carpark. Mr Tan parks his car from 11.30 a.m. to 2.00 p.m. How much will he have to pay?

Car Park Charges	
For the first hour	$2.50
For every additional $\frac{1}{2}$ hour	$0.80

11.30 a.m. to 12.30 p.m. → First h - $2.50

12.30 p.m. – 1.30 p.m. → 2 x $0.80 = $1.60

1.30 p.m. – 2p.m. → $0.80

Total → $2.50 + $1.60 + $0.80 = **$4.90**

He has to pay $4.90

RATE OF CHARGES

Question 3:

An adult entry ticket to a travel fair costs $3. For every 4 paying adults, the 5th adult receives a free entry ticket. What is the total cost of the entry tickets for 22 adults?

Question 3: Rate of Charges

An adult entry ticket to a travel fair costs $3. For every 4 paying adults, the 5th adult receives a free entry ticket. What is the total cost of the entry tickets for 22 adults?

22 ÷ 5 = 4R2 (4 groups of 5 adults with 2 adults remaining)
1 adult → $3
4 adults → $3 x 4 = $12
(Cost of 1 group of 5 adults will just pay for the cost of 4 adults)

1 group of 5 adults → $12
4 groups of 5 adults → $12 x 4 = $48
$48 + $3 + $3 = $54 (total cost of 4 groups of 5 adults with 2 adults remaining)

The total cost is $54.

Problems connected to everyday life

PERCENTAGE

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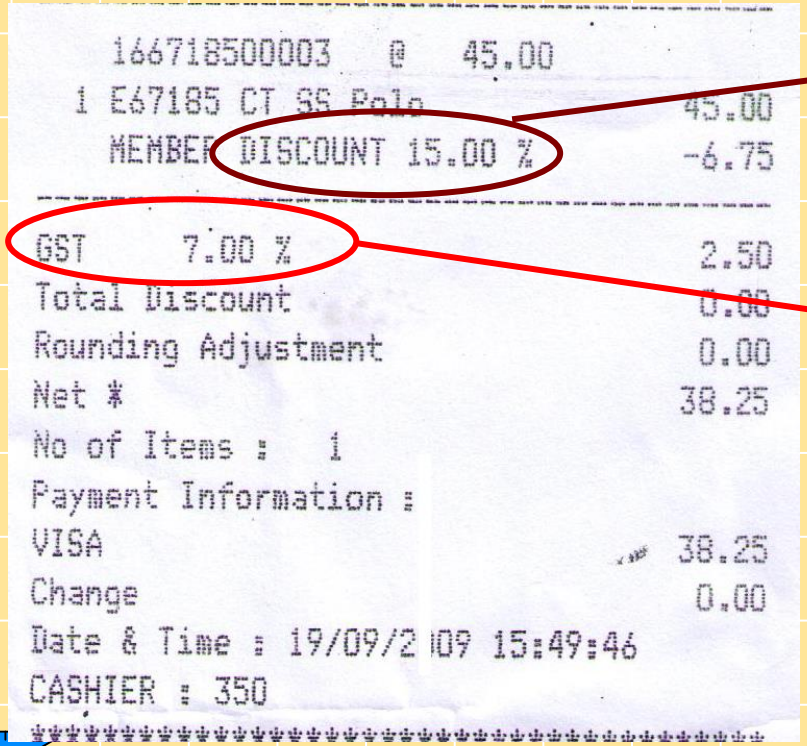
USES OF PERCENTAGE IN OUR EVERYDAY LIFE



166718500003 @ 45.00
1 E67185 CT SS Polo 45.00
MEMBER DISCOUNT 15.00 % -6.75
GST 7.00 % 2.50
Total Discount 0.00
Rounding Adjustment 0.00
Net * 38.25
No of Items : 1
Payment Information :
VISA 38.25
Change 0.00
Date & Time : 19/09/2009 15:49:46
CASHIER : 350

discount

GST – Goods & Services Tax

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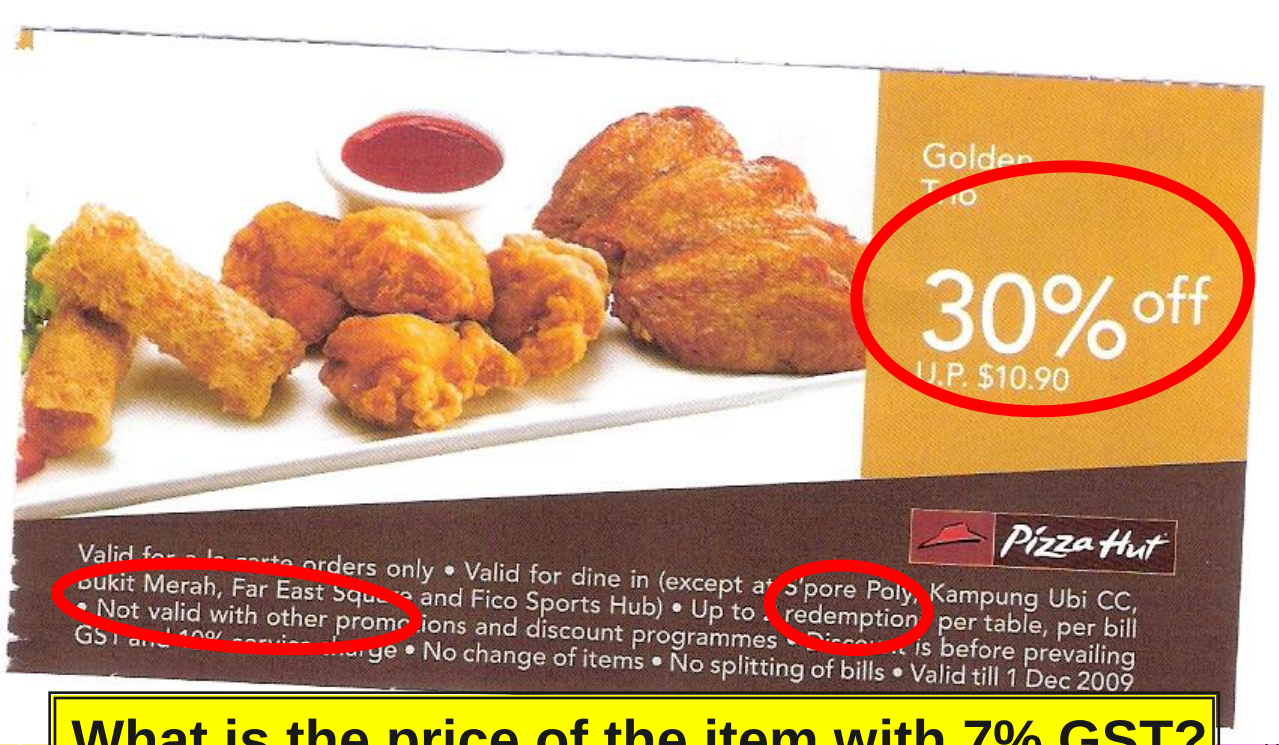
USES OF PERCENTAGE IN OUR EVERYDAY LIFE



What is the price of the item with 7% GST?

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PERCENTAGE

Question 1:

The usual price of a television set is $900. A discount of 15% is given during the great Singapore sale. What is the price of the television set after discount?

Question 1 : Percentage

The usual price of a television set is $900. A discount of 15% is given during the great Singapore sale. What is the price of the television set after discount?

15% of $900

$$= \frac{15}{100} \times \$900$$

= $135 (Discount)

$900 - $135 = **$765** (Price after discount)

The price of the television set after discount is **$765**.

PERCENTAGE

Question 2:

The price of a washing machine was $500. The GST is 7% of the price of the washing machine. How much did Mrs Lim pay for the washing machine inclusive of GST?

Question 2 : Percentage

The price of a washing machine was $500. The GST is 7% of the price of the washing machine. How much did Mrs Lim pay for the washing machine inclusive of GST?

7 % of $500

$= \frac{7}{100} \times \$500$

= $35 (GST)

$500 + $35 = **$535** (Price inclusive of GST)

Mrs Lim paid **$535** for the washing machine.

PERCENTAGE

Question 3:

A customer gets a 10% discount for the 5^{th} box of cereal and a 25% discount for the 10^{th} box of cereal bought. Each box of cereal costs $6. How much does Mr Suresh have to pay for 10 boxes of cereal?

Question 3 : Percentage

A customer gets a 10% discount for the 5th box of cereal and a 25% discount for the 10th box of cereal bought. Each box of cereal costs $6. How much does Mr Suresh have to pay for 10 boxes of cereal?

5th box:

100% - 10% = 90%

90% of $6 = $\frac{90}{100} \times \$6$

= **$5.40**

10th box:

100% - 25% = 75%

75% of $6 = $\frac{75}{100} \times \$6$

= **$4.50**

10 – 2 = 8 boxes (at $6 each)

(8 x $6) + $5.40 + $4.50 = **$57.90** (cost of 10 boxes of cereal)

Mr Suresh has to pay **$57.90** for 10 boxes of cereal.

PERCENTAGE

Question 4:

Rashin had two mobile phones, A and B. He sold the two phones at a discount of 25%. Phone A was sold for $78 and Phone B was sold for $120. What was the total price of the two mobile phones before the discount?

Question 4 : Percentage

Rashin had two mobile phones, A and B. He sold the two phones at a discount of 25%. Phone A was sold for $78 and Phone B was sold for $120. What was the total price of the two mobile phones before the discount?

Phone A:

100% - 25% = 75%

75% → $78

1% → $\frac{\$78}{75}$

= $1.04

100% → 100 x $1.04

= **$104**

(before discount)

Phone B:

100% - 25% = 75%

75% → $120

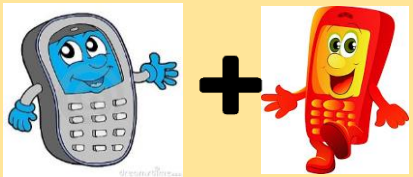
1% → $\frac{\$120}{75}$

= $1.60

100% → 100 x $1.60

= **$160**

(before discount)



Total cost of the 2 mobile phones before the discount:

= $104 + $160

= **$264** (total price before discount)

The total price of the two mobile phones before discount is **$264.**

Problems connected to everyday life

SHORTAGE AND EXCESS

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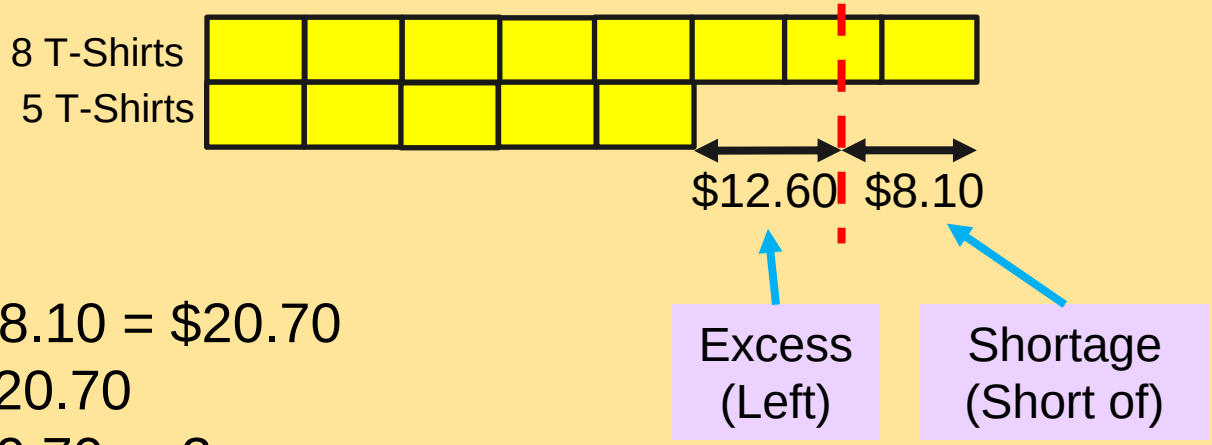
SHORTAGE & EXCESS

Question 1:

Raymond wanted to buy 8 T-shirts but he was short of $8.10. Instead he bought 5 T-shirts and had $12.60 left. How much would he need to pay for 20 T-shirts?

Question 1 : Shortage & Excess

Raymond wanted to buy 8 T-shirts but he was short of $8.10. Instead he bought 5 T-shirts and had $12.60 left. How much would he need to pay for 20 T-shirts?



$12.60 + $8.10 = $20.70

3 units = $20.70

1 unit = $20.70 ÷ 3

= $6.90 (1 T-shirt)

20 units = $6.90 x 20

= $138 (20 T-shirts)

He would need to pay **$138**.

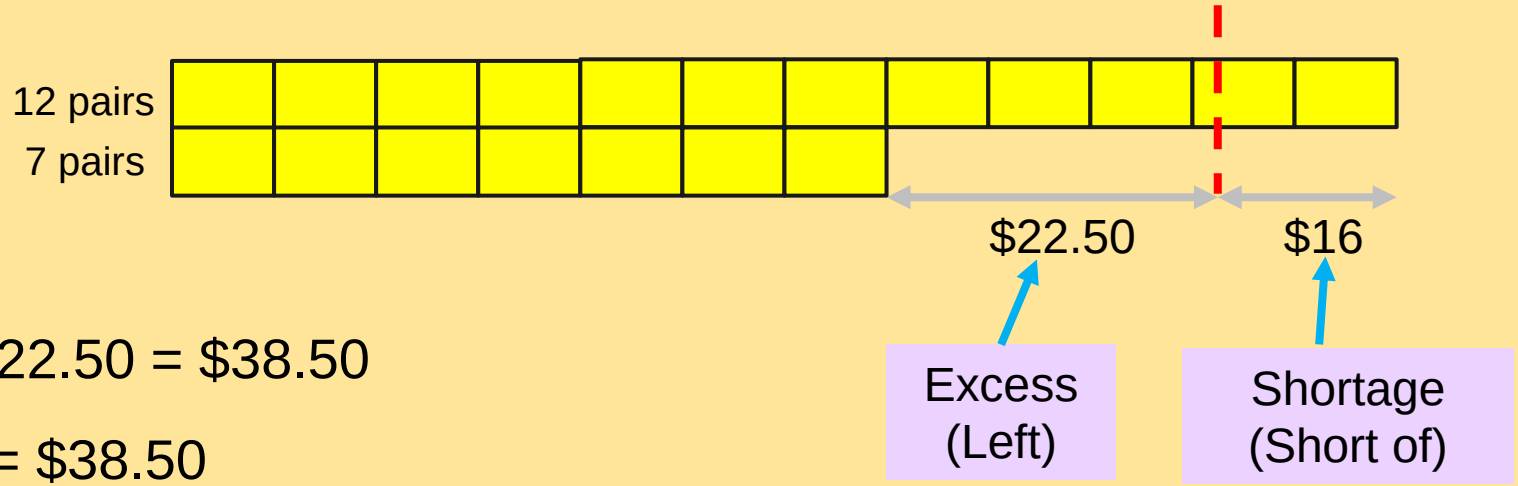
SHORTAGE & EXCESS

Question 2:

Ben had a sum of money. He wanted to buy 12 pairs of socks but was short of $16. Instead he bought 7 pairs of socks and was left with $22.50. What was the cost of 1 pair of socks?

Question 2 : Shortage & Excess

Ben had a sum of money. He wanted to buy 12 pairs of socks but was short of $16. Instead he bought 7 pairs of socks and was left with $22.50. What was the cost of 1 pair of socks?



$16 + $22.50 = $38.50

5 units = $38.50

1 unit = $38.50 ÷ 5

= $7.70 (1 pair)

1 pair of socks cost **$7.70**

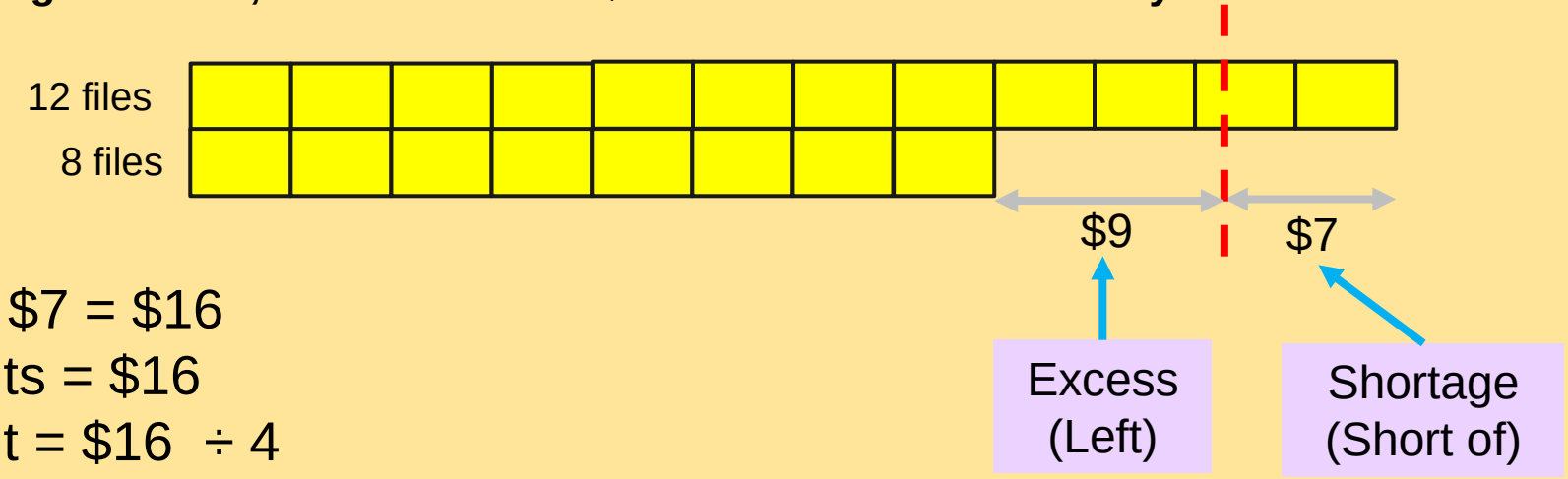
SHORTAGE & EXCESS

Question 3:

Freya had some money to buy some files. If she bought 8 files, she would have $9 left. If she bought 12 files, she would need $7 more. How much did Freya have?

Question 3 : Shortage & Excess

Freya had some money to buy some files. If she bought 8 files, she would have $9 left. If she bought 12 files, she would need $7 more. How much did Freya have?



$9 + $7 = $16
4 units = $16
1 unit = $16 ÷ 4
= $4 (1 file)
8 units = $4 x 8 = $32 (8 files)
$32 + $9 = $41 (Freya has)

Freya has **$41.**

Thank you for your attendance at this sharing session. ☺

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