CHAPTER 2

Brainstorming 1

In pairs

Aim: Determine the importance of making estimations and approximations in daily life.

Steps:

1. Read and understand the situations below.

Situation 1

Hashim is interested in a shirt sold in a supermarket with a 50% discount. The original price of the shirt is RM47.90. Hashim estimates the price of the shirt after discount and takes it to the cashier. The cashier informs him that the price of the shirt is RM28.70. Hashim argues that his estimation of the price is not more than RM25. Is Hashim's estimation correct?

Situation 2

Mrs Tan wants to buy 30 metres of cloth costing RM5.85 per metre to make curtains. She makes an estimation of the total price of the cloth and allocates RM180. Is the money allocated by Mrs Tan sufficient?

Discussion:

1. In the two situations above, how did Hashim and Mrs Tan make estimations of the total price?

2. Discuss with your friend the importance of making estimations and approximations.

3. State two other situations that require you to make estimations and approximations.

From Brainstorming 1, it is found that:

> Approximating a value to a certain significant figure allows us to make an accurate estimation.

Brainstorming 2

In pairs

Aim: Determine the effect of the position of the zero digit in integers and decimals.

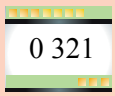
Steps:

1. Study the integer cards below.

Card 1

Card 2

Card 3



Card 4

Does the position of the zero digit have any effect on the value of digit 3?

2. Study the decimal cards below.

Card 5

Card 6

Card 7

Card 8

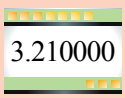
Does the position of the zero digit have any effect on the value of digit 3?

3. Study the decimal cards below.

Card 9

Card 10

Card 11



Card 12

Does the position of the zero digit have any effect on the value of digit 2?

4. Discuss with your friend the effect of the position of the zero digit on the value of digit 3 in Card 1 to Card 8 and the effect of adding zero digits on the value of digit 2 in Card 9 to Card 12.
5. Present the results of your discussion. Compare your results with other pairs.

Discussion:

What is your conclusion concerning the position of the zero digit in an integer or decimal?

From Brainstorming 2, it is found that:

(a) Card 1, Card 2, Card 3, Card 5, Card 6 and Card 7
- The position of the zero digit between or at the end of the number, maintains the place value of digit 3.

(b) Card 4 and Card 8
- The position of the zero digit as the first digit has changed the place value of digit 3.

(c) Card 9, Card 10, Card 11 and Card 12
- The position of the zero digit at the end of the decimal does not change the place value of digit 2.

In general,

- All non-zero digits are significant figures.
- The digit zero between non-zero digits is a significant figure.
- The digit zero at the end of an integer is a significant figure according to the level of accuracy required.
- The digit zero at the end of a decimal is a significant figure because it determines the level of accuracy of the decimal.
- The digit zero before the first non-zero digit is not a significant figure.

Brainstorming 3

In pairs

Aim: Write metric measurements in standard form.

Steps:

1. Complete the table below by writing the single numbers for metric measurements in standard form.

Prefix	Symbol	Value	
		Single number	Standard form
exa	E	1 000 000 000 000 000 000	1×10^{18}
peta	P	1 000 000 000 000 000	
tera	T	1 000 000 000 000	
giga	G	1 000 000 000	
mega	M	1 000 000	
kilo	k	1 000	
hecto	h	100	
deca	da	10	
–	–	1	1×10^{0}
deci	d	0.1	1×10^{-1}
centi	c	0.01	
milli	m	0.001	
micro	μ	0.000 001	
nano	n	0.000 000 001	
pico	p	0.000 000 000 001	
femto	f	0.000 000 000 000 001	
atto	a	0.000 000 000 000 000 001	

Discussion:

A number with too big or too small value can be written as a single number or in standard form. Which form will you choose for an arithmetic operation? Give your reasons.

From Brainstorming 3, it is found that:

Standard form makes it easier to write very big and very small numbers in a form that is simple and easy to understand.