



Exemplar 15 : Formulating an Algebraic Equation from a Word Problem

Objective : To formulate an equation to solve a word problem

Key Stage : 3

Learning Unit : Formulating Problems with Algebraic Language

Materials Required : Worksheet

Prerequisite Knowledge :

- (1) Using letters to represent numbers
- (2) Translating word phases into algebraic expressions
- (3) Solving simple linear equations

Description of the Activity :

1. The teacher distributes the worksheet to students.
2. Students do Question 1 as a warm-up exercise by linking the costs of the items in the question with the total cost.
3. When doing Question 2, the teacher tells students to follow Parts (a) to (e) which are designed as a guide in formulating an equation.
4. If students have difficulties in Question 3, the following questions could be asked:
 - (a) What is the given information?
 - (b) What is the value that you are asked to find?
 - (c) Can you use a letter to represent the unknown value?
 - (d) Is there any connection between the information given? If so, can you write an expression to link them together?
5. Intermediate steps are not given in Question 3 as it is designed for the students to apply the strategy learnt in Question 2. However, if students find it difficult to set up the equation, the teacher could guide them with the similar steps used in Question 2.

Worksheet: Formulating an Equation from a Word Problem

Edmund buys some soft drinks and fried chicken wings for a tea party.
Soft drinks cost \$5 per can and chicken wings cost \$8 each.

1. Four people including Edmund join the party and each one of them has 1 can of soft drink and 2 chicken wings. How much does Edmund have to pay for the party?

2. Six people including Edmund join the party and each one of them has a certain number of cans of soft drinks and 2 chicken wings. Edmund has to pay \$186. How many cans of soft drinks does each one have?

- (a) What is the unknown quantity in the problem?

- (b) How would you represent the unknown quantity?

- (c) Write an equation to solve the problem.

- (d) Solve the equation to find the value of the unknown.

(e) Write your answer in a complete sentence.

3. Nine people including Edmund join the party and each one of them has 3 cans of soft drinks and a certain number of chicken wings. Edmund has to pay \$423. How many chicken wings does each one have?

Notes for Teachers :

1. The answer to Question 1: \$84
Question 1 is quite straightforward and is designed as a warm-up exercise for formulating equations.
2. Question 2 is broken into parts (a) to (e). These five parts illustrate the steps involved in solving a word problem by an algebraic equation. These steps can be summarized as follows:
 - (i) Identifying the unknown quantity in the problem.
 - (ii) Using a letter to represent the unknown
 - (iii) Setting up an equation to link up the given information.
 - (iv) Solving the equation.
 - (v) Giving the answer in a complete sentence.
3. Answers to Question 2:
 - (a) The number of cans of soft drinks
 - (b) Let x be the number of cans of soft drinks
 - (c) $6 [(x)(5) + (2)(8)] = 186$
 - (d) $x = 3$
 - (e) Each one has 3 cans of soft drinks.
4. The answer to Question 3: Each one has 4 pieces of chicken wings.
Students could repeat the steps used in Question 2 to set up an equation and solve the problem.