

Innovating with the Multimodalities-Entextualization Cycle in Language Across the Curriculum (LAC) to Improve ESL Junior Secondary Students' English Literacy

Materials tried out in teachers' lessons:

Percentage: An LAC Collaboration [Teacher Version]

The following materials are designed by

Dr Yiqi Liu

Assistant Professor, Department of English Language Education, The Education University of Hong Kong

Miss Yi Cui

Senior Research Assistant, Department of English Language Education, The Education University of Hong Kong
and

Ms. Joe Man Wong

Tsung Tsin College

The lesson materials tried out represented an LAC collaboration between the **Math (S1)** department and the **English** department.

The LAC project is supported by Seed Funding Grant (2020/21) and CRAC Grant (2021/22),
The Education University of Hong Kong.

Copyright © 2022 The Education University of Hong Kong

All rights reserved.

Unit Overview

Percentage

Module	Percentage
Target Class Level	Form 1
Learning Objectives	<p>Previous Knowledge:</p> <p>Students have already mastered the concepts of percentage and percentage change</p> <p>Content learning objectives:</p> <p>At the end of the module, students will be able to:</p> <ol style="list-style-type: none"> 1) Understand the concepts of selling price/marked price/cost price, profit/loss, and discount/discount per cent. 2) Solve problems involving profit and loss and discount. <p>Language learning objectives:</p> <p>At the end of the module, students will:</p> <ol style="list-style-type: none"> 1) Understand the following language to solve problems involving profit/loss and discount: <p><i>Selling price, marked price, cost price, profit, loss, discount, \</i> <i>Discount per cent, respectively</i></p> <p><i>[A] sells [B] for/at [a number]</i> <i>[A] is sold at/for [a number]</i> <i>At a profit/loss of [%]</i> <i>suffer a loss of [%]</i> <i>A discount of [%]</i> <i>[%] off</i></p>

Contents

Part 1 Profit and Loss

Task 1 Language used for problems involving profit and loss

Language support 1 - language of profit and loss

Task 2 Solve problems of profit and loss

Task 3 Create stories of profit and loss

Part 2 Discount

Task 4 Language used for problems involving discount

Language support 2 - language of discount

Task 5 Solve problems of discount

Task 6 Create stories of discount

Part 3 My vocabulary bank and learning record

Task 7 My vocabulary bank

Task 8 My learning record

Part 1 Profit and Loss

Lead-in Activity

Listen to a [song](#) about percentage and fill in the blanks below:



1. **Percent** in Latin means a part of 100.
- 2.

Percentages

1%

=

(In Chinese)
百分數

Fractions

1/100

=

(In Chinese)
分數

Decimals

0.01

(In Chinese)
小數

Task 1 Language used for problems involving profit and loss

When solving problems involving profit and loss, it's important to understand the relationship among 1) profit/loss, 2) selling price 售價 and 3) cost price 成本. When you identify any two of them in the question, you will be able to obtain the one left by using the formulas below.

Profit (利潤)	Loss (虧損)
Profit = selling price - cost price	Loss = cost price - selling price
Profit% = (profit / cost price) * 100%	Loss% = (loss / cost price) * 100%
Profit = cost price * profit%	Loss = cost price * loss%
Selling price = cost price * (1 + profit%)	Selling price = cost price * (1 - loss%)

Let's see how questions involving profit and loss are typically formed.

Read the questions.

- 1) Identify the known and the unknown, and underline the signal words
- 2) Choose the formula to be used
- 3) Write the solution:

Questions	The known		The unknown	Formula used	Solution
Ken <u>buys</u> a TV game set <u>for</u> \$4800 and <u>sells</u> it <u>at</u> \$6000 later. <u>Find</u> the profit per cent.	Cost price = \$4800	Selling price = \$6000	Profit Profit%	Profit = Selling price - cost price	\$ (6000 - 4800) / 4800 = 25%
Signal words	Buys ... for ...	Sells ... at ...	Find the ...	Profit% = (profit / cost price) * 100%	
The <u>cost price</u> of a necklace is \$2500 and it is sold at <u>a profit of 55%</u> . (a) <u>Find</u> the profit. (b) <u>Find</u> the selling price of the necklace.	Cost price = \$2500	Profit % = 55%	Profit Selling price of the necklace	a) Profit = cost price * profit% b) Selling price = cost price * (1 + profit%)	a) \$2500 * 55% = \$1375 b) \$2500 * (1+55%) = \$3875
Signal words	The cost price of ...	A profit of ...	Find ...		
Miss Wong bought a gold cube last month. She <u>sells</u> the gold cube now <u>for</u> \$8280 and <u>suffers a loss of 8%</u> . <u>Find</u> the loss.	Selling price = 8280	Loss% = 8%	Cost price Loss	Selling price = cost price * (1 - loss%) Loss = cost price * loss%	Let the cost price of the gold cube be X. $X(1-8\%) = 8280$, $X = \$9000$ Loss: $\$9000 * 8\% = \720
Signal words	Sell for ...	Suffers a loss of ...	Find		

Language Support 1 - talking about profit and loss			
Talking about ...			
Cost price	Selling price	Profit %	Loss %
Buys for ... Bought for ... Is bought for ... The cost price of ... is	Sells at ... Is sold at ... The selling price of ... is ...	At a profit of ...	Suffers a loss of ...

Task 2 Solve problems involving profit and loss by filling in the table

Read the questions.

Identify the known and the unknown, and underline the signal words

Choose the formula to be used

Write the solution

Questions	The known		The unknown	Formula used	Solution
<u>The cost price</u> of a watermelon is \$40. It is sold at <u>a profit of 15%</u> . (a) <u>How much</u> is the profit? (b) <u>Find</u> the selling price of the watermelon.	Cost price = \$40	Profit% = 15%	Profit Selling price	Profit = cost price * profit% Selling price = Cost price + Profit	a) $\$40 * 15\% = \6 b) $\$(40+6) = \46
A shop <u>sells</u> a refrigerator at \$5700, with <u>a profit of 14%</u> . (a) <u>Find</u> the cost price.	Selling price = \$5700	profit % = 14%	Cost price	Selling price = cost price * (1+profit%)	Let the cost price of the refrigerator be X. $X (1+14\%) = 5700$, X = \$5000
(b) <u>Find</u> the new selling price if the <u>profit per cent</u> is decreased to 12%.	Cost price = \$5000	Profit % = 12%	Selling price	Selling price = cost price * (1 + profit %)	$\$5000 * (1+12\%) = \5600
Mrs Chan bought a diamond ring last year. She	Selling price = \$	Loss % = 20%	Loss	Selling price = cost price * (1	Let the cost price of the

sells her ring now for \$24 000 and she suffers a loss of 20%. <u>How much is the loss?</u>	24000		Cost price	- loss %) Loss = cost price * loss%	diamond ring be X. $X(1-20\%) = \$24000$, $X = \$30000$ Loss = \$30000 * 20% = \$6000
Nancy <u>bought</u> a gold coin for \$8080. After one month, she <u>sold</u> the gold coin to her friend Daniel at a <u>loss of</u> 10%. Daniel then <u>sold</u> the gold coin for \$7230. He claimed that he suffered a loss. Do you agree? Explain your answer.	Nancy's cost price = \$ 8080	Nancy's loss% = 10%	Nancy's selling price	Selling price = cost price * (1- Loss %)	\$8080*(1-10%) = \$7272
	Daniel's cost price = Nancy's selling price = \$7272	Daniel's selling price = \$ 7230	Is the selling price smaller than the cost price?	Compare the selling price and the cost price	7272 > 7230, so he suffered a loss.

Task 3 Create questions according to the solutions

You are given the solutions. Now create questions that can be solved by the given solutions. One example has been done for you.

Solution	Different parts of the solution			Question
\$ (4200+800) = \$ X, X = 5000	The known		The unknown	Ada bought a watch for \$ 4200. She earns \$800 by selling it. Find the selling price of the watch.
	The cost price = \$ 4200	Profit = \$800	The selling price = \$ 5000	
Signal words	Buys ... for Bought .. for	At a profit of Earns ...	The selling price of ... is ...	

\$ 3600 - X = \$ 1800; X = \$ 1800 (1800/3600)* 100% = 50%				(student's answer)
Signal words				
X (1-20%) = \$400; X = \$500				(student's answer)
Signal words				
\$120 * (1+X %) = \$ 192, X = 60%				(student's answer)
Signal words				

Part 2 Discount

Task 4 Language used for problems involving discount

When solving problems involving profit and loss, it's important to understand the relationship among 1) discount, 2) marked price 標價 and 3) selling price 售價. When you identify any two of them in the question, you will be able to obtain the one left by using the formulas below.

Discount = Marked price - selling price
Discount % = (discount / marked price) * 100%
Discount = marked price * discount %
Selling price = marked price * (1 - discount %)

Let's see how questions involving profit and loss are typically formed.

Read the questions.

- 1) Identify the known and the unknown, and underline the signal words
- 2) Choose the formula to be used
- 3) Write the solution

Questions	The known		The unknown	Formula used	Solution
A department store offers a <u>30% discount</u> to customers for all items. If a school bag is <u>sold at</u> \$455, <u>find</u> its marked price.	Discount % = 30%	Selling price = \$ 455	Marked price	Selling price = marked price * (1 - discount %)	Let the marked price of the bag be X. $X(1-30\%) = \$455$, $X = \$650$
Signal words	...discount	Sold at ...	Find ...		
The <u>marked price</u> of a dining table is \$1300. If it is <u>sold at</u> \$936, <u>find</u> the discount percent.	Marked price = \$ 1300	Selling price = \$936	Discount %	Discount % = (discount / marked price) * 100%	$\$[(1300-936) / 1300] * 100\% = 28\%$
Signal words	Marked price of ...	Sold at ...	Find ...	Discount = Marked price - selling price	
The <u>marked price</u> of a guitar is \$3400, and it is sold at <u>10% off</u> . a) <u>Find</u> the selling price of the guitar	Marked price = \$3400	Discount % = 10%	Selling price	Selling price = marked price * (1 - discount %)	$\$3400 * (1-10\%) = \3060
Signal words	Marked price of ... is ...	Sold at ... off	Find		
b) If the <u>cost price</u> of the guitar is \$2000, <u>find</u> the profit per cent.	Cost price = \$2000	Selling price = \$3060	Profit %	Profit % = [(selling price - cost price) / cost price] * 100 %	$\$[(3060-2000) / 2000] * 100\% = 53\%$

Signal words	Cost price of ... is ...	From question a)	Find		
--------------	--------------------------	------------------	------	--	--

Language Support 2 - talking about discount		
Talking about ...		
marked price	Selling price	Discount %
The marked price of ... is ...	Is sold at ... The selling price of ... is ...	% off

Task 5 Solve problems involving discount by filling in the table

Read the questions.

Identify the known and the unknown, and underline the signal words

Choose the formula to be used

Write the solution

Questions	The known		The unknown	Formula used	Solution
The <u>marked price</u> of a notebook is \$28. If it is <u>sold at</u> \$24.5, find the discount per cent.	Marked price = \$28	Selling price = \$24.5	Discount %	Discount = Marked price - selling price Discount % = (discount / marked price) * 100%	$\$(28-24.5) = \$ 3.5$ $\$(3.5/28) * 100\% = 12.5\%$
In a restaurant, the <u>marked price</u> and the <u>selling price</u> of lunch set A are \$45 and \$36 <u>respectively</u> (分別是).	Marked price = \$45	Selling price = \$36	Discount %	Discount = Marked price - selling price Discount % = (discount / marked price) * 100%	Profit for A: $\$(45-36) = \$ 9$ Profit % for A: $\$(9/45) * 100\% = 20\%$ Profit for B: $\$(80-68) = \$ 12$
The <u>marked price</u> and the <u>selling price</u> of lunch set B are \$80 and \$68	Marked price = \$80	Selling price = \$68	Discount %	Discount = Marked price - selling price	Profit % for B:

<u>respectively</u> . Which lunch set is sold at a larger <u>discount per cent</u> ?				Discount % = (discount / marked price)	$\$(12/80)$ $*100\% = 15\%$ A's profit % > B's profit %
The <u>marked price</u> of a smartphone case is \$108, and it is sold at <u>30% off</u> . (a) Find the selling price of the smartphone case.	Marked price = \$108	Discount % = 30%	Selling price	Selling price = = marked price * (1 - discount %)	\$ 108 * (1-30%) = \$75.6
(b) If the <u>cost price</u> of the smartphone case is \$54, find the profit per cent.	Cost price = \$54	Selling price = \$75.6	Profit %	Profit = Selling price - cost price Profit % = (profit / cost price) * 100%	\$ [(75.6-54) / 54] * 100% = 40%

Task 6 Create questions according to the solutions

You are given the solutions. Now create questions that can be solved by the given solutions. One example has been done for you.

Solution	Different parts of the solution			Question
$\$3400 * (1 - x\%) = \3060 , $x = 10$	The known		The unknown	The marked price of a mattress is \$3400; it is now sold at \$3060. Find the discount per cent of the mattress.
	marked price = \$3400	Selling price = \$3060	Discount %	
Signal words	The marked price of ... is ...	Sold at ...	Discount per cent	
$X (1-30\%) = \$420$, $X = \$600$				(student's answer)
Signal words				

\$500 * (1-16%) = \$X, X = \$420				(student's answer)
Signal words				
\$650 * (1-x %) = \$455, x=30				(student's answer)
Signal words				

Part 3: My vocabulary bank and learning record

In this part, you will revise the topic vocabulary and assess your learning.

Task 7. My Vocabulary Bank

Algebraic equations in one unknown		
Subject-specific vocabulary	General academic vocabulary	Linking words
<i>Percentage (n.)</i> <i>Cost price (n. ph.)</i> <i>Selling price (n. ph.)</i> <i>Profit (n.)</i> <i>Loss (n.)</i> <i>Marked price (n. ph.)</i> <i>Discount (n.)</i>	<i>... is sold at ... (v. ph.)</i> <i>The marked/cost/selling price of ... (n. ph.)</i> <i>... off (adv.)</i> <i>At a profit/discount/loss of ... (n. ph.)</i> <i>Suffer (v.)</i> <i>Respectively (adj.)</i>	<i>Expressing time or condition/ result:</i> <i>Ago...</i> <i>After...</i>

Task 8. My learning record

Put a tick (✓) if you think you can manage the item in this unit.

Do I know...?

	Item:	Yes (✓) / No (X)
1.	the concept of selling price/marked price/cost price, profit/loss, and discount/discount per cent.	
2.	How to solve problems involving profit and loss and discount	
3.	<p>the following language to solve problems involving profit/loss and discount:</p> <p><i>Selling price, marked price, cost price, profit, loss, discount, \</i> <i>Discount per cent, respectively</i></p> <p><i>[A] sells [B] for/at [a number]</i> <i>[A] is sold at/for [a number]</i> <i>At a profit/loss of [%]</i> <i>suffer a loss of [%]</i> <i>A discount of [%]</i> <i>[%] off</i></p>	



