

Topic Overview	
Topic	BAFS Elective Part – Accounting Module – Cost Accounting A09: Cost Accounting for Decision Making – Application of Costing Concepts and Techniques in Decision Making
Level	S5 / S6
Duration	3 lessons (40 minutes per lesson)

Learning Objective:

To apply costing concepts and techniques for decision-making under business environment.

Overview of Contents:

- Lesson 1 Prepare Marginal Costing Statements to Make Drop Out Decisions of a Product
- Lesson 2 Distinguish Sunk Costs from Future Costs for Decision Making in Selling an Additional Product Line
- Lesson 3 Apply the Concept of Opportunity Costs for a Selling Decision

Resources:

- Topic Overview, Teaching Plan and Answers to Student Worksheet
- PowerPoint Presentation
- Student Worksheet

Suggested Activities:

- Group Discussion
- Matching
- Case Study

Lesson 1	
Theme	Prepare Marginal Costing Statement to Make Drop Out Decision of a Product
Duration	40 minutes

Expected Learning Outcomes:

Upon completion of this lesson, students will be able to:

1. Define and classify expenses into variable cost, specific fixed cost and general fixed cost;
2. Identify variable and specific fixed costs, which are relevant for a product drop out decision and general fixed costs, which are irrelevant for such decisions; and
3. Prepare marginal costing statement to determine if a particular product should be eliminated by the business.

Teaching Sequence and Time Allocation:

Activities	Reference	Time Allocation
Part I: Introduction		
<ul style="list-style-type: none"> ◇ Teacher starts the lesson by asking and recalling students' understanding on marginal costing and types of cost of a manufacturing business under marginal costing system. ◇ Under marginal costing, the calculation of net profit of a business is gone through. <ul style="list-style-type: none"> ■ Teacher shows students that for manufacturing businesses, costs can be classified into variable costs and fixed costs under marginal costing. 	PPT #1-3	5 minutes

<p>◇ Activity 3 - Preparation of Income Statement to facilitate Drop Out Decision of Model B of the Lunar New Year Stall Case</p> <ul style="list-style-type: none"> ■ Students are required to classify all costs inside the Draft Income Statement into variable cost, specific fixed cost and general fixed cost in Task 1 and then prepare a revised income statement with recommendation in Task 2. 	<p>PPT #12-15</p> <p>Student Worksheet pp.6-7</p>	<p>13 minutes</p>
<p>Part III: Conclusion</p>		
<p>◇ Teacher concludes the lesson by explaining:</p> <ul style="list-style-type: none"> ■ Variable and specific fixed costs are relevant for the drop out decision because they will change as a result of the decision. ■ General fixed costs are irrelevant for the drop out decision because they remain unchanged by the decision. 	<p>PPT#16</p>	<p>2 minutes</p>

Lesson 2	
Theme	Distinguish Sunk Costs from Future Costs in Decision Making in Selling an Additional Product
Duration	40 minutes

Expected Learning Outcomes:

Upon completion of this lesson, students will be able to:

1. Classify costs into future costs, incremental costs and sunk costs; and
2. Apply future costs and incremental costs in decision making when selling an additional product.

Teaching Sequence and Time Allocation:

Activities	Reference	Time Allocation
Part I: Introduction		
<ul style="list-style-type: none"> ◇ Teacher starts the lesson by asking students to offer some examples of variable costs, specific fixed costs and general fixed costs learnt from last lesson. 	PPT #17-19	5 minutes
Part II: Content		
<ul style="list-style-type: none"> ◇ Teacher explains the meaning of future costs and sunk costs. Teacher tells students that only future costs are relevant to decision making. ◇ Case Study <ul style="list-style-type: none"> ■ Students are divided into groups of four or five. They read a case of an additional product, Model D, to be sold in a Lunar New Year Stall. The case study theme to determine whether or not sales of Model D will earn a profit. It is important that only costs which are relevant to this decision are taken into account. ◇ Activity 4 – Costs of Materials of Model D Students are requested to distinguish between future costs from sunk costs of materials to be used for making Model D. Teacher reminds students that only 	PPT#20-21 PPT#22	5 minutes 8 minutes
	PPT#23 Student Worksheet	

<p>future costs are relevant to the sales decision of the product.</p> <ul style="list-style-type: none"> ■ Teacher checks the results with students 	<p>pp.8-9 PPT #24-25</p>	
<ul style="list-style-type: none"> ◇ Teacher explains the meaning of incremental costs and explains that they are relevant to decision making. ◇ Activity 5 - Additional charges of general fixed costs arising from the sales of Model D <ul style="list-style-type: none"> ■ Students are asked to identify incremental costs of two general fixed expenses because they are relevant to the decision making of selling Model D. ■ Teacher checks the results with students 	<p>PPT #26-27 PPT #28 Student Worksheet pp.10-11 PPT#29</p>	<p>3 minutes 8 minutes</p>
<ul style="list-style-type: none"> ◇ Activity 6 - Selling of Model D in Lunar New Year Fair <ul style="list-style-type: none"> ■ Students are asked to advise whether Model D should be sold in Lunar New Year Fair by preparing an income statement. They are reminded that only costs that are relevant to the sales decision are included in the statement. ■ Teacher checks the results with students 	<p>PPT#30 Student Worksheet pp.12 PPT #31</p>	<p>8 minutes</p>
Part III: Conclusion		
<ul style="list-style-type: none"> ◇ Teacher concludes the lesson that future costs and incremental costs are relevant to decision making whereas sunk costs are irrelevant to decision making. 	<p>PPT #32</p>	<p>3 minutes</p>

Lesson 3	
Theme	Apply the Concept of Opportunity Costs for a Selling Decision
Duration	40 minutes

Expected Learning Outcomes:

Upon completion of this lesson, students will be able to:

1. Identify opportunity costs; and
2. Apply the concept of opportunity cost in a selling decision.

Teaching Sequence and Time Allocation:

Activities	Reference	Time Allocation
Part I: Introduction		
◇ Teacher starts the lesson by revisiting the concept that incremental costs are relevant to decision making.	PPT #33-35	5 minutes
Part II: Content		
◇ Teacher explains the meaning of opportunity costs and tells students that they are relevant to decision making.	PPT #36	5 minutes
◇ Activity 7 – Identify the Opportunity Costs		
■ Students are divided into groups of four or five. They are required to read a case of a summer sales to be organised by Student Union. They are requested to identify opportunity costs of two sales items, namely folders and pencil cases, in order to fix their selling price.	PPT #37 Student Worksheet pp.13-14	8 minutes
■ Teacher checks the results with students.	PPT #38	
◇ Activity 8 - Soft toys to be sold in Summer Clearance Sales?	PPT #39	8 minutes
■ Students are asked to identify the opportunity costs for another sales decision. In this case, Student Union has to determine whether or not to sell soft toys at summer sales.	Student Worksheet pp.15	
■ Teacher checks the results with students	PPT #40-41	

<p>✧ Teacher tells students that opportunity costs and incremental costs are relevant to decision making.</p>	PPT #42	3 minutes
<p>✧ Activity 9 - Discussion</p> <ul style="list-style-type: none"> ■ Students are requested to prepare an income statement to see whether any loss will arise from paying salaries to Student Union members in summer sales. Students are reminded that both opportunity costs and incremental costs that are relevant to the decision should be included in the statement. ■ Teacher checks the results with students 	<p>PPT #43</p> <p>Student Worksheet p.16</p> <p>PPT #44</p>	8 minutes
Part III: Conclusion		
<p>✧ Teacher concludes the lesson that as incremental costs and opportunity costs are changed by a decision, they are relevant to decision making.</p>	PPT #45-46	3 minutes

Answer to Student Worksheet

Activity 3: Preparation of Marginal Costing Statement to facilitate Drop Out Decision of Model B of the Lunar New Year Fair Case

Revise Income Statement				
	Model A	Model B	Model C	Total
	(2,000 units)	(1,000 units)	(700 units)	
	\$	\$	\$	\$
Sales	40,000	30,000	35,000	
Less: Variable Cost				
Purchase cost	17,000	--	--	
Materials	--	26,000	18,200	
Royalty charge	5,000	--	--	
Contribution	18,000	4,000	16,800	
Less: Specific Fixed Cost				
One set of special tools	--	1,000	--	
Hire charge of a special equipment	--	--	4,800	
Contribution after Specific Fixed Cost	18,000	3,000	12,000	33,000
Less: General Fixed Costs				
Materials for fixing and decorating the stall				3,000
Transportation expense				4,800
Rental of the stall				21,000
Net Profit / (Loss)				4,200

Answer to Student Worksheet**Activity 6**

		Model D
		\$
Sales		22,500
Less: costs		
-Material X	0	
-Material Y	23,000	
-Incremental costs on decoration materials	1,000	
-Incremental costs on transportation expenses	<u>0</u>	<u>24,000</u>
Net Loss		<u>1,500</u>

Answer to Student Worksheet**Activity 9**

<u>Relevant costs</u>	\$
1. Opportunity costs	
- Folders	2,000
- Pencil cases	3,500
- Soft toys	8,000
2. Incremental costs of salaries to be paid to the five members	<u>1,500</u>
Relevant costs	15,000
Less: Sales revenue	<u>16,000</u>
Profit	<u>1,000</u>

BAFS Elective Part Accounting Module – Cost Accounting

Topic A09:

Cost Accounting for Decision Making –
Application of Costing Concepts and
Techniques in Decision Making

Technology Education Section
Curriculum Development Institute
Education Bureau, HKSARG
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Lesson 1

Prepare marginal costing statement
to make drop out decision of a
product

Topic A09
Cost Accounting for Decision-making

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BAFS Elective Part
Learning and Teaching Example

Introduction

This session will apply cost concepts and techniques for decision-making. Suggested activities include group discussion, matching and case study.

Duration

Three 40-minute lessons

Contents

Lesson 1 – Prepare Marginal Cost Statement to Make Drop Out Products Decisions

Lesson 2 – Distinguish Sunk Costs from Future Costs in Decision Making for Selling Additional Products

Lesson 3 – Apply the Concept of Opportunity Costs for Selling Decisions

Lesson 1

A product drop out decision can be made by using marginal costing concepts and techniques. Upon completion of this lesson, students are capable of preparing such marginal costing statements and making appropriate decisions.

Recall your memory ...



- What is marginal costing?
- How can costs of a manufacturing business be classified under marginal costing?

Recall the students' learning concerning marginal costing and types of costs for a manufacturing business.

Under marginal costing, net profit of a business is calculated as follows:

Net profit = Sales – Variable costs – Fixed costs

whereas, (Sales – Variable costs) is known as Contribution

in other words, Net profit = Contribution – Fixed costs

For a manufacturing business, costs can be classified under marginal costing as follows:

- Variable costs include direct materials, direct labour, direct expenses and variable overheads such as electricity charges and water charges.
- Fixed costs such as rent and rates, insurance, salaries.

Definition of variable and fixed cost:

- Variable cost – A cost which tends to vary with the level of activity. (CIMA Official Terminology)
- Fixed cost – A cost which is incurred for a period, and which, within certain output and turnover limits, tends to be unaffected by fluctuations in the level of activity. (CIMA Official Terminology)

Classification of costs under marginal costing



- Two categories of costs:
 - **Variable costs** – costs that vary in direct proportion to units manufactured.
 - **Fixed costs** – costs that are fixed in short term no matter the number of units manufactured.

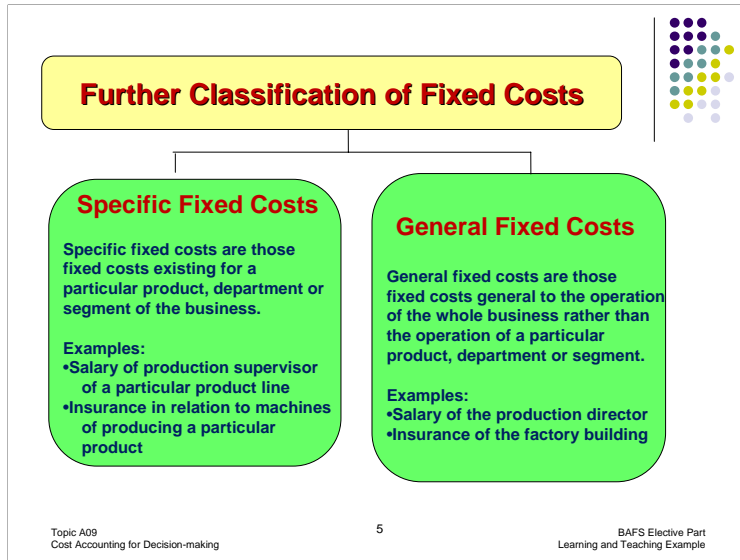
Introduce the cost categories under marginal costing. It serves as a response to the last PPT and cost classification is also an important concept to be applied in the case study.

Variable cost increases (decreases) proportionally when units increase (decrease). For example, the material cost for a product (say a T-shirt) is \$50, this material cost will change as follows:

Number of units	Material cost
0	0 (\$50 x 0)
100	5,000 (\$50 x 100)
300	15,000 (\$50 x 300)
800	40,000 (\$50 x 800)

Material costs, which is a variable cost, will reduce to zero if no T-shirt is produced.

Fixed costs will not change when the number of units increases or decreases. For example, the factory monthly rent is \$20,000, this rental expense will not change if the business manufactures zero or 100 units of product.



Some businesses produce more than one type of product, or they have more than one department, or they sell goods in several market segments. For these businesses, fixed costs can be further analysed into specific and generalised fixed costs. This breakdown of fixed costs is important for decision making.

Application of specific fixed costs for decision making:

A company sells goods in Hong Kong, Malaysia and Thailand via three local offices and pays a monthly rental of \$10,000, \$5,000 and \$6,000 respectively for the three locations. Rental expense (say \$6,000) is a fixed cost because it remains unchanged no matter the number of goods sold in Thailand. However, it is related specifically to Thailand operations only. In other words, this specific fixed cost (rental expense of \$6,000) can be saved if the company closes down its Thailand operations. This information is relevant for the management to decide whether to close down the Thailand operation.

Application of general fixed costs for decision making:

In the above example, the company's head office is located in Hong Kong. The Sales Director is responsible for overseeing the company's total sales operations and his month salary is \$40,000. This fixed cost cannot be reduced even the company closes down its operation in Thailand. This information is NOT relevant for the management to decide whether to close down the operation in Thailand.

Case Study – The Lunar New Year Stall

- Refer Student Worksheet P.1 and 2
 - Your class rented a stall during the Lunar New Year Fair
 - Draft income statement shows total net profit of \$4,200 with two models earning a profit and one model making a loss

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Cost Accounting for Decision-making

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BAFS Elective Part
Learning and Teaching Example

Teacher introduces the case study to students.

The case study is about sales planning of three products (Models A, B and C) during the Lunar New Year Fair. However, the draft income statement shows that Model B produces a net loss of \$6,600. In this case, students must consider whether the class can earn more profit (original \$4,200) if it does not sell Model B.

This product drop out decision can be made if the income statement is prepared by using marginal costing concepts. In order to alert and guide students to prepare a revised income statement, brain-storming discussions are designed in Activities 1 and 2 while preparation of the statement is in Activity 3.

Activity 1: Discussion

● Refer Student Worksheet P.3

- Can any cost item of Model B be eliminated if it is dropped in the Lunar New Year Fair?



Teachers ask students to form groups of four or five to discuss the case study and write down their opinions on the student worksheet.

To drop Model B means the number of units becomes zero. Ask students to think if the class still needs to pay for each cost item concerned.

Activity 1: Answer

Cost item of Model B	Cost can be eliminated if Model B is dropped (Yes or No)	Explanation
Materials (\$26,000)	Yes	Use of materials varies in direct proportion to the number of units produced. When the class does not sell Model B, the relevant materials are not required, therefore, this cost can be eliminated.
Materials for fixing and decorating the whole stall (\$1,000)	No	Fixing and decorating the stall is required no matter two or three models are sold. This cost cannot be eliminated.
One set of special tools (\$1,000)	Yes	Special tools will not be required if Model B is dropped, therefore, this cost can be eliminated.
Transportation expense (\$1,600)	No	Since it is expensed for the whole operation rather than Model B particularly, it cannot be eliminated.
Rental of the stall (\$8,600)	No	Rental of the stall (\$25,800) must be paid no matter the Stall sells two or three models of products, therefore, this cost cannot be eliminated.

Teachers can refer to the explanation column above for details.

Calculation of Net Profit under Marginal Costing



Sales at \$100 per unit (100 units)	\$10,000
Less: Variable cost at \$80 per unit	8,000
Contribution	2,000
Less: Fixed cost	5,000
Net Profit / (Loss)	(3,000)

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Cost Accounting for Decision-making

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BAFS Elective Part
Learning and Teaching Example

Under marginal costing, all costs are classified into variable and fixed costs, and net profit is calculated as follows:

Net profit = Sales – Variable costs – Fixed costs

whereas, (Sales – Variable costs) is known as Contribution

in other words, Net profit = Contribution – Fixed costs

In the above slide, the company makes a net loss of \$3,000 when it sells 100 units. Someone may suggest to not sell the goods to avoid a loss. It is incorrect. The company needs to pay the fixed costs no matter the number of units sold. Without selling the 100 units, the company's net loss will increase to \$5,000. The only way to reduce net loss or even turn it into net profit is to earn more contribution, greater the amount of contribution means greater net profit. Management should refer contribution rather than net profit for decision-making.

Activity 2: Discussion



• Refer Student Worksheet P.4 and 5

- Which one of the two income statements can facilitate the drop out decision of Model B?



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BAFS Elective Part
Learning and Teaching Example

The previous slide shows the basic format of the income statement under marginal costing. It is suitable for a single product situation. In our case, there are three product models, we need more specific information on individual models for the drop out decision.

In activity 2, students are required to choose a suitable income statement to facilitate their decision-making. Students are also required to provide comments / reasons for their choice.

Activity 2: Answer

Format 2	Model A \$	Model B \$	Model C \$	Total \$
Sales	40,000	30,000	35,000	
Less: Variable cost				
Expense A	xx	xx	xx	
Expense B	xx	xx	xx	
Contribution	xxx	xxx	xxx	
Less: Specific fixed cost				
Expense C	xx			
Expense D		xx		
Expense E			xx	
Contribution after specific fixed cost	xx	xx	xx	xxx
Less: General fixed cost				
Expense F				xx
Expense G				xx
Expense H				xx
Net profit/ (loss)				xxx

- Format 2 should be chosen.
- It shows contribution and specific fixed cost for each model.

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BAFS Elective Part
Learning and Teaching Example

Format 1 is suitable for a multi-products situation and contribution on each model is shown. However, there are specific fixed costs in our case and these costs affect a particular model only. Format 1 does not show their effects and does not support the drop out decision.

Format 2 is the best one for multi-products with a specific fixed cost situation. It shows individual contribution as well as the specific fixed costs on each model. This format can facilitate the drop out decision of Model B.

Both variable and specific fixed costs of Model B can be eliminated if this model is dropped. Sale of Model B will provide a net contribution (i.e. contribution after specific fixed costs) for the deduction of general fixed costs. More total net contribution means more total net profit. Therefore, when Model B provides a positive contribution after specific fixed cost, Model B should be retained. On the other hand, if Model B results in a negative contribution after specific fixed costs, then Model B should be dropped.

Activity 3: Preparation of income statement to recommend on the drop out decision of Model B

Task 1

- Refer Student Worksheet P.6
 - Classify costs into variable cost, specific fixed cost and general fixed cost



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BAFS Elective Part
Learning and Teaching Example

Task 1 of activity 3 will facilitate students' preparation of the revised income statement in Task 2. Students are required to classify the cost items into variable costs, specific fixed costs and general fixed costs.

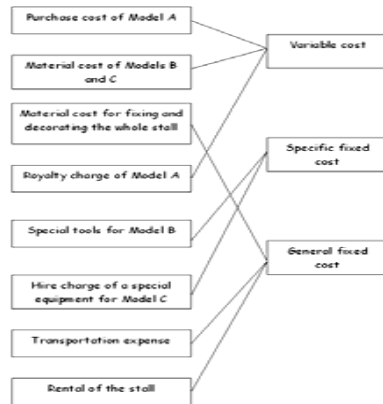
Revision

Variable costs – A variable cost increase (decrease) proportionally when the number of units increase (decrease).

Specific fixed costs – A specific fixed cost relates to a particular product, department or segment of a business.

General fixed costs – A general fixed cost is generally related to the overall business operational costs rather than operational cost of a particular product line, department or segment.

Task 1: Answer



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BAFS Elective Part
Learning and Teaching Example

Teacher checks the answer with students.

Purchase costs of Model A, material costs of Models B and C as well as a royalty charge of Model A are variable costs because they vary in direct proportion to the number of units.

Special tools for Model B and hire charges for special equipment of Model C are specific fixed costs because they are incurred specifically for the models concerned and the amounts are fixed sums unrelated to the number of units.

Material costs for fixing and decorating the stall, transportation expense as well as rental of the stall are general fixed costs because these expenses are required no matter the stall sells two or three models of products.

Activity 3: Preparation of income statement to recommend on the drop out decision of Model B

Task 2

- Refer Student Worksheet P.7
 - Prepare a revised income statement
 - Give your recommendation

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BAFS Elective Part
Learning and Teaching Example

With reference to the answer of Activity 1 and 2 and Task 1 of Activity 3, students are required to prepare an income statement. Recommendation can be made by reference to the figure "Contribution after specific fixed cost" of Model B.

Teacher can refer to Topic Overview p.9 for suggested answer.

Task 2: Answer

Revised Income Statement				
	Model A (2,000 units)	Model B (1,000 units)	Model C (700 units)	Total
	\$	\$	\$	\$
Sales	40,000	30,000	35,000	
Less: Variable Cost				
Purchase cost	17,000	--	--	
Materials	--	26,000	18,200	
Royalty charge	5,000	--	--	
Contribution	18,000	4,000	16,800	
Less: Specific Fixed Cost				
One set of special tools	--	1,000	--	
Hire charge of a special equipment	--	--	4,800	
Contribution after Specific Fixed Cost	18,000	3,000	12,000	33,000
Less: General Fixed Costs				
Materials for fixing and decorating the stall				3,000
Transportation expense				4,800
Rental of the stall				21,000
Net Profit / (Loss)				4,200

- Model B should **NOT** be dropped.

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BAFS Elective Part
Learning and Teaching Example

The purpose of this activity is to determine whether dropping Model B can increase the total net profit of \$4,200. As explained in slide #11 if Model B can provide a positive contribution after specific fixed costs, Model B should be retained. On the other hand, if Model B results are a negative contribution after specific fixed costs, then Model B should be dropped.

Referring to the income statement above, Model B should not be dropped in the Lunar New Year Fair because by dropping it the total net profit will reduce from \$4,200 to \$1,200 (by cutting \$3,000 contribution after specific fixed cost from Model B).

Conclusion

- **Variable and specific fixed costs are**
 - relevant to drop out decisions because they change due to the decision.
- **General fixed costs are**
 - irrelevant to drop out decisions because they remain unchanged by the decision.

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BAFS Elective Part
Learning and Teaching Example

Classification of costs are important for management decisions.

Without such a classification, the draft income statement fails to reflect the true trading results of the three models. With the classification of cost into variable costs, specific fixed costs and general fixed costs, the revised income statement shows the figure "contribution after specific fixed cost" for the drop out decision.

End of Lesson 1

Lesson 2

Distinguish sunk costs from future costs for decisions involving the production and selling of additional products



Lesson 2

In this lesson, students are required to identify and apply future costs in decision making.

Only future costs, not sunk costs, are relevant for decision making.

The case study discussion is about deciding whether to sell an additional product during the Lunar New Year Fair. It is profitable if its sales revenue exceeds future costs.

Some costs will be affected by the decision whether to sell an additional product. These costs are called future costs. They are relevant for decision making. On the other hand, costs already incurred will be unaffected by the decision of whether to sell the additional product. These costs are called 'sunk costs' which is irrelevant for decision making.

Future costs and sunk costs will be discussed in-depth in the lesson.

Recall your memory ...

- What are variable costs? Any examples?
- What are general fixed costs and specific fixed costs? Any examples?



Definition of variable cost – A cost which tends to vary with the level of activity. (CIMA Official Terminology)

Examples of variable costs – Direct materials, direct labour, direct expenses

- Referring to the case study in Lesson 1, the materials for making the models in Lunar New Year Fair

Definition of fixed costs – A cost which is incurred for a period, and which, within certain output and turnover limits, tends to be unaffected by fluctuations in the level of activity. (CIMA Official Terminology).

Fixed costs can be divided into general and specific

1. General business fixed costs will not be changed when a particular product, department or segment is added or cancelled.

Examples:

- Salary of the production manager
- Insurance of the factory building
- Referring to the case study, rental of the stall in Lunar New Year Fair

2. Specific fixed costs are those fixed costs exiting for a particular product, department or segment.

Examples:

- Salary of production supervisor of a particular product line
- Insurance in relation to machines of a particular product
- Referring to the case study, special tools for Model B in Lunar New Year sales

Recall your memory ...



- Variable costs and specific fixed costs are relevant to drop out decisions and the production of new products
- General fixed costs are not relevant for drop out decisions for producing new products

Referring to the case study in Lesson 1, variable costs and specific fixed costs of Model B are used to calculate the contribution. As the contribution after specific fixed costs is positive, the product should not be dropped. Thus, variable costs and specific fixed costs are relevant for the product drop out decision.

On the other hand, general fixed costs, e.g. rental of the stall, remain unchanged no matter whether Model B will be dropped. These costs are irrelevant to the product drop out decision.

Are all variable costs relevant for decision making?



- 'Variable costs' are relevant for decision making if they are 'future costs'.
- Future costs are costs that will be changed by a decision.
- Examples: Materials to be purchased for a product, workers to be hired for manufacturing a product

Teacher further elaborates how variable costs are relevant for decision making.

Referring to the case study in Lesson 1, material costs of Model B are relevant to the product drop out decision. Why? Because if the model is dropped the material costs will be eliminated. The future materials cost is zero.



- Variable costs will be irrelevant for decision making if they are sunk costs.
- Sunk costs are those costs that will not be changed by a decision.
- Examples: Materials already purchased to be used for manufacturing a product, workers already hired to be transferred to manufacture a product

Teacher tells students what sunk costs are and its relevancy to decision-making.

The materials in stock were purchased at \$700. These materials are transferred out of stock and used for manufacturing Product X.

The material costs for Product X will be zero, but not \$700 because the materials were previously purchased. Material costs of \$700 remain no matter whether Product X is manufactured or not. Thus, the \$700 is a sunk cost. This cost is irrelevant for the production decision making under cost accounting.



Case Study

Further discussion about The Lunar
New Year Sales – the selling of
additional product, Model D

Students can refer to Student Worksheet p.8 for the case study.

The class committee executive team hopes to raise profits during Lunar New Year sales by selling an additional product of Model D. This proposal will be acceptable if this product brings in a profit.

In order to determine whether the sales of Model D will earn a profit, it is important that students can distinguish between future and sunk costs. Otherwise, profits will be calculated incorrectly and lead to incorrect decisions.

Activity 4 – Costs of Material X and Material Y for Model D



1. Material X left from last year's Lunar New Year Fair was purchased at \$20,000. It has no other use.
 2. Material Y left from last year's Lunar New Year Fair was purchased at \$22,000. It is a popular material. If used up, it has to be replaced at \$23,000.
- Required: Identify the material costs which are relevant for the decision of selling Model D.

This activity requires students to distinguish between future and sunk costs for Material X and Material Y. Ask students to read the case carefully. Remind them that only future costs are relevant to selling Model D as sunk costs are irrelevant to the decision.

Activity 4 – For Material X



Material X was purchased at \$20,000 in last year.

Purchasing cost of \$20,000 remains unchanged no matter whether Model D will be made for Lunar New Year sales.

It is a **sunk cost** which is irrelevant for the decision to sell Model D.

Teacher invites students to offer their answers and concludes that the purchasing cost of \$20,000 is a sunk cost and irrelevant to the selling Model D decision. The cost of Material X for Model D is zero.

Activity 4 – For Material Y



Material Y was purchased at \$22,000 in last year. This cost is a **'sunk cost'** which is **irrelevant** for sales decision making for Model D.

The replenishment cost of Material Y, \$23,000 is a **'future cost'**. This cost is **relevant** for decision of selling Model D.

Teacher continues to tell students that the cost of replacing Material Y is \$23,000 which is a future cost.

The replenishment cost of \$23,000 is a future cost and incurred if Model D is sold during the Lunar New Year Fair.


Are all general fixed costs irrelevant for decision making?



- If general fixed costs remain unchanged by making a choice over alternatives, they will be irrelevant for decision making.
- Examples: Rent of a factory,
Insurance of a factory

Teacher reminds students that general fixed costs which remain unchanged are irrelevant to decision making.

Referring to the case study in Lesson 1, rental of the stall in Lunar New Year Fair remains unchanged no matter whether Model B is dropped or not.

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- If general fixed costs are changed by making a choice over alternatives, these costs will be relevant for decision making.
 - If general fixed costs increase as a result of a decision, this increase represents an incremental cost.
 - Example: extra rent for a bigger factory to producing an additional product

However, teacher should show to students that if general fixed costs are changed by making a choice over alternatives, it will be relevant for decision making. Teacher further elaborates this idea and introduces what incremental cost is.

The rent of a factory to manufacture existing products amounts \$100,000. Following the production of an additional product, a bigger factory has to be leased. The rent of the new factory will be \$150,000. The additional rent of \$50,000 represents an increase in fixed cost. This increase is an incremental cost which is relevant for the decision making of producing an additional product.



Activity 5 – Additional charges of general fixed costs arising from the sales of Model D

1. Material costs for decorating the stall, \$3,000

Following the sales of Model D, the costs of new decoration materials will be \$4,000.

2. Transportation expense, \$4,800

The other class offers to transport free of charge Model D from school to the stall. The hiring fee of a van to be paid by the other class amounts \$7,000.

Required: Identify the incremental costs of decoration materials and transportation expenses.

In this activity, remind students to consider the incremental fixed cost arising only from the sales of Model D.

Activity 5 – answer



1. Incremental costs of decoration materials is \$1,000

Due to the sales of Model D, special decoration materials will be purchased. Additional costs of \$1,000 (\$4,000 - \$3,000) will then be incurred.

2. Incremental costs of transportation: Zero

The hiring charge of the transportation van remains unchanged.

Teacher invites students to answer the question. Here is further elaboration for point 2: The hiring fee of a van which is used by the other class to transport Model D is irrelevant for the sales decision making of the product. It is because the class's own transportation expense is unaffected by such decision.

Activity 6 – Selling of Model D in Lunar New Year Fair?



Hints for discussion:

- Model D will be sold if a profit is made.
- Sales revenue of Model D is estimated to be \$22,500.
- Refer to the cost estimations in Activity 4 and Activity 5

In Activity 6, students are required to decide whether Model D should be sold during the Lunar New Year Fair. Students should note that only future variable costs and incremental fixed costs are relevant to the decision of selling Model D.

Activity 6 – Answer

	Model D
	\$
Sales	22,500
Less: Costs	
-Material X	0
-Material Y	23,000
-Incremental costs on decoration materials	1,000
-Incremental costs on transportation expense	0
	<u>24,000</u>
Net loss	<u>1,500</u>



Conclusion

- ‘**Variable costs**’ which are future costs are **relevant** for decision making.
- ‘**Variable costs**’ which are sunk costs are **irrelevant** for decision making.
- ‘**Incremental fixed costs**’ are **relevant** for decision making.

Teacher can invite students to demonstrate the calculation with explanation.

Remarks:

- Model D should not be sold because a loss of \$1,500 will be suffered.
- Cost of Material X is zero because it is a sunk cost.
- Cost of Material Y is a future cost. It amounts \$23,000.
- Only the additional costs of decoration materials, \$1,000 represents the incremental fixed costs. No incremental cost is incurred on the transportation fee.

Teacher concludes the lesson by highlighting the following:

- Future costs and incremental costs are costs that are affected by a choice of alternatives. Thus, they are relevant for decision making.
- Sunk costs are the costs that will be not be affected by a choice of alternatives. Thus, they are irrelevant for decision making.
- In the case study, the future and incremental costs are the Material Y cost and cost of decoration materials respectively. On the other hand, the sunk cost is the cost of Material X.
- In order to determine whether to sell Model D in Lunar New Year Fair, an income statement must be prepared to show the trading result. It is important that only the future costs and incremental costs, but not the sunk costs, are taken into account. As a result, a \$1,500 loss will be suffered by selling the product. It is not advisable to sell Model D.

End of Lesson 2

Lesson 3

Apply the concept opportunity costs for sales decisions



Lesson 3

In this lesson, students will identify and apply opportunity costs to a sales decision.

Following decisions will be discussed in this lesson:

- i) setting price of products; and
- ii) products to be sold in the summer or at Christmas.

Recall your memory ...

- What are incremental costs?
- Why do we need to consider when using incremental costs for decision making?



Teacher reviews the definition of incremental costs which are incurred additional costs.

Example of incremental costs: The labour costs of \$500,000 to manufacture existing products and requires additional workers. Wages will increase to \$650,000 or by an additional \$150,000. This increase is an incremental cost which is relevant to the decision of whether to produce and sell an additional product.

Recall your memory ...

- Incremental costs are relevant for decision making .

Referring to the case study in Lesson 2, the extra \$1000 cost of decoration materials is incurred if an additional product is sold. Teacher reminds students that this extra cost or incremental cost is relevant to the decision to sell an additional product.

Opportunity costs

- Opportunity costs is the value of best alternative foregone.
- Examples of opportunity costs: the profit foregone on producing an alternative product
- Opportunity costs should be considered for decision making e.g. use material A to make Product X or Product Y.

In addition to incremental costs, opportunity costs should be considered in the decision.

Further elaboration of opportunity costs:

Material A of \$8,000 will be purchased for manufacturing Product X with a selling price of \$8,500. Alternatively, the materials could be used to manufacture Product Y which will earn a profit of \$1,000. If the company manufactures Product X, it will sacrifice a profit of \$1,000 from the lost output of Product Y. This represents an opportunity cost of \$1,000.

If material A is used for manufacturing Product X, its opportunity cost is \$1,000. This cost is important for making decisions to use material A to manufacture Product X because its selling price of \$8,500 is less than its total relevant cost of \$9,000 i.e. \$8,000 (incremental costs) + \$1,000 (opportunity cost).

Case study – Summer Clearance Sales

Activity 7: Set the prices of folders and pencil cases in summer sales



Sales Items which are kept in stock:

1. Batches of folders with SU logo are to sold at the coming Easter Carnival. The sales revenue would be \$2,000.
2. Batches of pencil cases are to be sold at the coming Christmas Fun Fair or Easter Carnival. Their sales revenue would be \$3,000 or \$3,500 respectively.

Required:

Identify the opportunity costs of the folders and the pencil cases to be sold in the summer sales as to fix the selling price at a mark-up.

Topic A09
Cost Accounting for Decision-making

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BAFS Elective Part
Learning and Teaching Example

Teacher introduces the case study to students. They are required to identify the opportunity costs of folders and the pencil cases to be sold in the summer sales in Activity 7.

Opportunity costs of the summer clearance sale must be identified to help establish a selling price because the costs will have been understated and a loss may then be suffered.

Activity 7 - answer



	\$	Explanation
Folders	2,000	the revenue to be earned in an alternative function i.e. Easter Carnival is foregone. The value of an alternative foregone is an opportunity cost.
Pencil cases	3,500	the greater revenue to be earned in Easter Carnival is foregone. The value for the best alternative foregone is an opportunity costs.

Topic A09
Cost Accounting for Decision-making

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BAFS Elective Part
Learning and Teaching Example

Teacher invites students to answer the question.

In conclusion, students must set the folders total selling price and pencil cases above \$2,000 and 3,500 respectively in order to earn a mark-up during the summer sale.

Activity 8

The selling of soft toys in Summer Clearance Sales?



Soft toys which are kept in stock:

- If the soft toys are sold at Christmas Fun Fair, a revenue of \$20,000 will be earned.
- The rent of storing the soft toys during the summer vacation will be \$12,000.
- If the soft toys are sold in the summer sales, a revenue of \$10,000 will be earned.

Required:

Shall we support that the soft toys would not be sold at the Summer Clearance Sales?

Topic A09
Cost Accounting for Decision-making

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BAFS Elective Part
Learning and Teaching Example

In this activity students are required to show their support for not selling the soft toys during the summer clearance sale.

If a loss will be suffered from selling the soft toys during the Summer Clearance Sale, then this item should not be sold. It will happen when the opportunity costs of the soft toys are greater than their revenue to be earned.

Activity 8 - answer



	\$	Explanation
1. Revenue of soft toys to be earned at Summer Clearance Sales	10,000	
2. Opportunity costs i.e. net revenue of soft toys to be earned at Christmas Fun Fair sales	8,000	Net revenue to be earned at Christmas Fun Fair of soft toys is the deduction of ...

Topic A09
Cost Accounting for Decision-making

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BAFS Elective Part
Learning and Teaching Example

Teacher invites students to provide answers.

Activity 8 - answer



	\$	Explanation
		the incremental costs \$12,000 from its revenue. This net amount is the value of Christmas sales foregone. It is an opportunity cost of summer sales of soft toys.
Net profit (1-2)	2,000	

Topic A09
Cost Accounting for Decision-making

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BAFS Elective Part
Learning and Teaching Example

Teacher concludes that the soft toys should be sold at summer clearance sale as it will generate a \$2000 profit meaning that the SU will be better off selling soft toys during the summer clearance sale rather than the Christmas Fun Fair.

Costs relevant for decision making



- Incremental costs as well as opportunity costs are relevant for decision making.

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Cost Accounting for Decision-making

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BAFS Elective Part
Learning and Teaching Example

Examples of incremental costs and opportunity costs⁵ relevant for decision making:

The existing stock of materials could be utilised for a special order at a conversion cost of \$2,000. Alternatively, this old stock could be sold at a scrap value of \$500.

The incremental cost of the special order is \$2,000 and the opportunity cost is \$500. Thus, the relevant costs total \$2,500.

Application of relevant costs (incremental costs plus opportunity costs) for decision making:

- The special order will be accepted if its selling price is higher than \$2,500.

Remind students that opportunity costs can be easily overlooked as compared to incremental costs. Incremental costs involve expected future payments while opportunity costs may be implicit to decisions. Whenever relevant costs are calculated, opportunity costs should not be ignored.

Activity 9

Will the SU members be paid for their extra work in Summer Clearance Sales?



- A salary of \$300 will be paid to each SU members for their extra work in summer sales.
- The sales revenue in Summer Clearance is estimated to be \$16,000.
- The Secretary argues that a loss will be suffered following the additional costs on salaries paid to the committee members. Thus, the proposal of salaries payment should be rejected.

Required:

Is the Secretary's argument acceptable?

In this activity students will determine whether paying for extra work by SU members will result in a profit loss. Students are required to refer to Student Worksheet p.16 to answer the question.

- If the relevant costs of summer sales (after the payment of salaries) are greater than the sales revenue of \$16,000, the Secretary's argument will be accepted.
- The relevant costs include the followings:
 - i) opportunity costs of folders, pencil cases and soft toys identified in Activity 7 and Activity 8.
 - ii) incremental salary costs of the five committee members for extra work.

Activity 9 - answer



Relevant costs

1. Opportunity costs	
- Folders	2,000
- Pencil cases	3,500
- Soft toys	8,000

2. Incremental costs

- Salaries to SU members for their extra work	<u>1,500</u>
	15,000

Less: Sales revenue 16,000

Profit 1,000

\$

Teacher invites students to demonstrate their answers.

The relevant summer sales costs include opportunity costs of \$13,500 and incremental costs of \$1,500 = \$15,000.

The relevant summer sales costs are less than the sales revenues of \$16,000. Thus, no loss will be suffered.

The Secretary's argument to avoid paying the five committee members salaries should not be accepted.

Conclusion



- Opportunity costs and incremental costs are relevant for decision making.

Teacher concludes the lesson by highlighting the following:

- Opportunity costs and incremental costs are relevant to decision making.
- In the case study, the opportunity costs are the folders, pencil cases and soft toys revenues that were foregone during the Christmas or Easter sales period, following the sales decision in the summer.
- Incremental costs mean additional costs incurred as a result of decisions made. In the case study, the incremental costs are salaries to paid to 5 SU committee members for extra work.
- Both the opportunity and incremental costs are relevant to the decision making process. In the case study, The decision making scenarios include the following:
 - i) price setting of folders and pencil cases;
 - ii) soft toys to be sold in Summer Sales or Christmas Sales; and
 - iii) salaries to paid to SU committee members for their extra work in Summer Sales or not.

The End



End of Lesson 3.

BAFS Elective Part – Accounting Module – Cost Accounting**Topic A09: Cost Accounting for Decision Making –Application of Costing Concepts and Techniques in Decision Making**

Case Study - The Lunar New Year Stall



This is the second year that your class has successfully bid for a stall in the Lunar New Year Fair in Victoria Park. Last year the trading results were just slightly better than breakeven, the target for this year is to make further improvement. The strategy is the same as last year to sell one licensed product (Model A) and two types of hand-made products (Models B and C) created by your class.

Based on experience in last year and the current sourcing of materials, Chairman of the class committee produces a drafted income statement as follows:

Draft Income Statement

	Model A (2,000 units) \$	Model B (1,000 units) \$	Model C (700 units) \$	Total \$
Sales	40,000	30,000	35,000	105,000
Less: Cost / Expenses				
Purchase cost	17,000	--	--	17,000
Materials	--	26,000	18,200	44,200
* Materials for fixing and decorating the whole stall	1,000	1,000	1,000	3,000
Royalty charge of \$2.5 per unit sold	5,000	--	--	5,000
One set of special loose tools	--	1,000	--	1,000
Hire charge of a special equipment	--	--	4,800	4,800
* Transportation expense	1,600	1,600	1,600	4,800
* Rental of the stall	7,000	7,000	7,000	21,000
	<u>31,600</u>	<u>36,600</u>	<u>32,600</u>	<u>100,800</u>
Net Profit / (Loss)	<u>8,400</u>	<u>(6,600)</u>	<u>2,400</u>	<u>4,200</u>

* Expenses for the entire operation are apportioned equally among the three models.

Activity 1: Discussion

The class committee executive team had a meeting today to discuss the above statement. A member raised the point that since Model B incurs a net loss of \$6,600, if the class is not to sell this model and to save all costs, the total net profit can be more than \$4,200.

Discuss in your group whether all costs of Model B can be eliminated in case this model is dropped. Write your opinion in the table below.

Cost item of Model B	Cost can be eliminated if Model B is dropped (Yes or No)	Explanation
Materials (\$26,000)		
Materials for fixing and decorating the whole stall (\$1,000)		
One set of special loose tools (\$1,000)		
Transportation expense (\$1,600)		
Rental of the stall (\$7,000)		

Hint: Does the class still need to pay the costs concerned if Model B is not sold?

Activity 2: Discussion

As some costs of Model B cannot be eliminated even by dropping the model, it may be unwise to decide not selling Model B at this moment. The Treasurer is requested to revise the income statement drafted by the Chairman. He prepares an income statement under marginal costing to reflect the true picture of the trading results of the three models.

Consider which of the following income statements will be selected by the Treasurer to cause a drop out decision of Model B.

Format 1	Model A \$	Model B \$	Model C \$	Total \$
Sales	40,000	30,000	35,000	
Less: Variable cost				
Expense A	xx	xx	xx	
Expense B	xx	xx	xx	
Contribution	xxx	xxx	xxx	xxxx
Less: Fixed cost				
Expense C				xx
Expense D				xx
Expense E				xx
Expense F				xx
Expense G				xx
Expense H				xx
Net profit / (loss)				xxx

Format 2	Model A \$	Model B \$	Model C \$	Total \$
Sales	40,000	30,000	35,000	
Less: Variable cost				
Expense A	xx	xx	xx	
Expense B	xx	xx	xx	
Contribution	xxx	xxx	xxx	
Less: Specific fixed cost				
Expense C	xx			
Expense D		xx		
Expense E			xx	
Contribution after specific fixed cost	xx	xx	xx	xxx
Less: General fixed cost				
Expense F				xx
Expense G				xx
Expense H				xx
Net profit / (loss)				xxx

Comments:

Activity 3: Preparation of Income Statement to facilitate Drop Out Decision of Model B of the Lunar New Year Stall Case**Task 1**

Classify the following costs on the income statement on P.2 into variable costs, specific fixed costs and general fixed costs. This classification of costs will facilitate the preparation of the revised income statement.

Purchase cost of Model A	
Material cost of Models B and C	Variable cost
Material cost for fixing and decorating the whole stall	
Royalty charge of Model A	Specific fixed cost
Special tools for Model B	
Hire charge of a special equipment for Model C	General fixed cost
Transportation expense	
Rental of the stall	

Further discussion about The Lunar New Year Sales

- the selling of additional product, Model D



Activity 4 - Costs of Materials of Model D

As Model B earns a positive contribution after specific fixed costs of \$3,000, the class committee executive team decides that the model should not be dropped. However, the team hopes to raise profit by \$4,200. Some members suggest that another hand-made product, Model D, be introduced during the Lunar New Year sales to potentially produce a profit.

To make the decision on whether to sell Model D, its costs have to be estimated by the Treasurer. The product requires Material X and Material Y. The following information is about the costs of these two materials:

1. No need to purchase **Material X** because there is \$20,000 of material still available from last year's Lunar New Year Fair. If the material is not used, it will be discarded by the end of the academic year.

- 2. Leftovers of Material Y purchased at \$ 22,000 for Last year's Lunar New Year is just enough to make **Model D**. However, **Material Y** is a popular material and used frequently by various class activities. If material is unavailable, then a new \$23,000 purchase must be initiated.

Required: Identify the material costs which are relevant to the sales decision making of Model D.

Answer: _____

Explanation: _____

Activity 5 - Additional charges of general fixed costs arising from the sales of Model D

Following the introduction of Model D in Lunar New Year sales, the general fixed costs are examined using the following data:

1. Material costs for fixing and decorating the stall

In order to highlight Model D, instead of using the original material which costs \$3,000, special material will be purchased for decorating the stall. The new materials cost \$4,000.

2. Transportation expense

The original transportation expenses of \$4,800 represent hiring a van for transporting the products of Model A, Model B and Model C from school to the event.

As an additional Model D product must be delivered to the New Year sales stall, a bigger van must be hired. But the hiring fee is too expensive. Fortunately, the other class which has also successfully bid for a sales stall offers a free transport of Model D for your class. The transportation van fee of \$7000 will be paid by the other class.

Required: Identify the incremental costs of decoration materials and transportation expenses on the assumption that Model D is to be sold at the event.

1. Incremental costs of decoration materials

Answer: _____

Explanation: _____

2. Incremental costs of transportation

Answer: _____

Explanation: _____

Activity 6 - Selling of Model D in Lunar New Year Fair

A class committee meeting is held to make a decision on whether to sell Model D in Lunar New Year Fair. In the meeting, the Treasurer reports his estimated costs e.g material costs, for the model. Furthermore, he estimates 1,500 units of Model D to be sold in the Lunar New Year sales. Sales revenue of \$22,500 will then be earned.

Required:

Advise whether Model D should be sold in Lunar New Year Fair.

(Hint: 1. If the sales of Model D can bring in a profit, it is worthwhile to add it in the Lunar New Year Fair. Profit means that the sales revenue of Model D, \$22,500, exceeds its costs.

2. Refer to the cost estimations in activity 1 and activity 2)

	Model D
	\$
Sales	22,500
Less: costs	

Net Profit/Net Loss	=====



Summer Clearance Sales

You are a committee member of Student Union (SU) which runs various functions, including Christmas Fun Fair and Easter Carnival each year. Donated items by sponsors will be sold to raise fund during these two events. All items are kept in SU storeroom at school.

Near the end of the school term, SU receives a notice from school that its storeroom will be renovated during the summer vacation. The renovation will be completed in 3 months and the items in the storeroom must be relocated. Some committee members have suggested that a 3-day summer clearance sale on the school playground be held right after the examination to sell the items. Hopefully, the event will produce handsome profit.

As you are SU treasurer, you are charged with reviewing costs and placing an appropriate mark-up to remain competitive and generate profits. The storeroom items are as follows:

1. Folders with the SU logo to be sold at the upcoming Easter Carnival. The sales revenue would be \$2,000.
2. Pencil cases scheduled to be sold at the upcoming Christmas Fun Fair or Easter Carnival. Expected sales revenue is \$3,000 and \$3,500 respectively.

Activity 7 : Identify the Opportunity Costs

Identify the opportunity costs of the folders and the pencil cases to be sold in the summer sales to determine a mark-up and final selling price.

(Hint: no purchase costs because they are all donated items)

	\$	Explanation
Folders		
Pencil cases		

Activity 8 : Soft toys to be sold in Summer Clearance Sales?

Bulky soft toys donated by a toy company are being kept in the storeroom. It is expected that total revenue of approximately \$20,000 could be generated from the upcoming Christmas Fun Fair. However, the school does not have adequate storage space to inventory the items.

Fortunately, the uncle of a committee member has small storeroom available at his factory that can be rented for 3-months for a total of \$12,000.

The SU committee members are considering whether to sell the soft toys at the Summer Clearance Sales or Christmas Fun Fair. If the toys are sold at the clearance sale, the revenue will be approximately \$10,000 which is 50% of what could be generated at Christmas Fun Fair. Therefore, some members are opposed to participating at the clearance function.

Discussion:

Shall we support that the soft toys not be sold in Summer Clearance Sales?

(Hint: 1. Consider the 'opportunity costs' to forego the Christmas Fun Fair event.

2. If the revenue to be earned at the Summer Clearance Sale is less than its opportunity costs, then the event is not attractive).

	\$	Explanation
1. Revenue of soft toys to be earned at Summer Clearance Sales		
2. Opportunity costs of summer sales of soft toys		
Net profit / Net loss (1 -2)		

Activity 9 : Discussion

A SU committee meeting is held to discuss the 3-day summer sales to be organised immediately after the examination. In the meeting, five committee members are requested to go back to school to man the sales counter. The Chairman suggests that a salary of \$300 will be paid to each member for his/her extra work.

However, the Secretary is strongly against this suggestion. He argues that the cost of the summer sales will be raised by the pay to the five committee members. Consequently, a loss may be experienced as the summer sales revenue is estimated to be \$16,000.

Discussion:

Is the Secretary's argument acceptable?

(Hint: 1. Calculate the relevant costs of summer sales.

2. Relevant costs include opportunity costs of folders, pencil cases and soft toys plus the incremental costs of the salaries paid to the five committee members.

3. If the relevant costs are greater than the sales revenue of \$16,000, the Secretary's argument of not paying salaries to the five members would be valid.)

<u>Relevant costs</u>	\$
1. Opportunity costs	
- Folders	
- Pencil cases	
- Soft toys	
2. Incremental costs of paying salaries to SU members for their extra work	_____
Relevant costs (1)	
Less: Sales revenue (2)	
Profit/Loss (2) - (1)	=====