# MODULE 12
# MANUFACTURING ACCOUNTING

Before starting this module, the educator should ensure that the learner has a good understanding of a retail business with regard to the cost price and selling price of their products. The learner should also understand the role of a bookkeeper and an accountant.

**Note to Teacher:**
The purpose of this module is to expose learners to the different roles of management and financial accounting. Combined with this, we will look at basic cost concepts in a manufacturing environment. Learners are not expected to make the necessary ledger entries until grade 11 and then in grade 12 to produce a production cost statement. However, this is a very important section in understanding the concepts so that the recording can be completed with ease in later years.

## TASK 12.1 ⌘ Differences between retail and manufacturing businesses

| | |
|---|---|
| **12.1.1** | TRUE |
| **12.1.2** | FALSE<br>The shoe factory buys the rolls of leather to manufacture shoes. |
| **12.1.3** | FALSE<br>The raw materials are used to produce finished goods. A combination of raw materials are sometimes used. |
| **12.1.4** | TRUE |
| **12.1.5** | FALSE<br>Most supermarkets buy the finished product (cheese, butter, etc.) from the dairy and they sell the finished product at a higher price to the consumer. |

## TASK 12.2 ⌘ Definitions and explanations of basic cost concepts

| **COLUMN "X"** | | **COLUMN "Y"** |
|---|---|---|
| **12.2.1** | Direct labour | B |
| **12.2.2** | Indirect labour | H |
| **12.2.3** | Direct materials (raw materials) | D |
| **12.2.4** | Indirect materials | G |
| **12.2.5** | Factory overhead costs | F |
| **12.2.6** | Prime cost | I |
| **12.2.7** | Variable costs | E |
| **12.2.8** | Fixed costs | A |
| **12.2.9** | Work-in-progress | C |

## TASK 12.3 ⌘ Trendy Clobber: Basic cost concepts

Allow for various responses: Suggested answers:

| | |
|---|---|
| **12.3.1** | Fabric, Zips, Buttons, Wages for factory workers; packaging |
| **12.3.2** | LABOUR – Wages for factory workers<br>MATERIAL – Fabric |

**12.3.3**

| | |
|---|---|
| **Direct material cost** | |
| Fabric | R4 500 |
| Zips | 1 500 |
| Buttons | 100 |
| | |
| | |
| **Direct labour cost** | |
| Wages for factory workers | 1 250 |
| | |
| **Indirect Material Cost** | |
| Cleaning materials | 200 |
| Packaging | 500 |
| | |

| | |
|---|---|
| **12.3.4** | The direct material cost is generally what the factory needs to buy so as to produce the final product. This is the main item and it is necessary to know this so that the owners know where to buy this item from and at what price, e.g. fabric and buttons.<br><br>The indirect material is necessary in the manufacture of the product, e.g. cleaning materials and packaging. |

## TASK 12.4 ⌘ Trendy Clobber (2): Factory overhead costs

| | |
|---|---|
| **12.4.1** | Insurance R1 500; Rent R1 000 |
| **12.4.2** | Stationery for office R100 |
| | Telephone for business R500 |
| | Insurance for business R1 000 |
| | Rent R200 |
| | Salaries for administration staff R2 000 |
| **12.4.3** | A smaller part of the building is used for the office and a greater part of the building is used for the factory. |
| **12.4.4** | Yes. Insurance is necessary. The business has invested a huge amount in raw materials and equipment. If there is an accidental fire or a burst pipe during the night, there could a huge loss in raw materials and equipment. Insurance will assist in recovering most if not all of the amount lost in such circumstances |

## TASK 12.5 Trendy Clobber (3): Completion of form

**TRENDY CLOBBER**
**PRODUCTION COSTS FOR THE PERIOD ENDING ……..……..**

| | | | |
|---|---|---|---|
| **Direct labour:** | | R1 250 | |
| Wages for factory workers | 1 250 | | |
| **Direct materials:** | | R6 100 | |
| Fabric | 4 500 | | |
| Zips | 1 500 | | |
| Buttons | 100 | | |
| **Prime cost (direct labour and materials)** | | | R7 350 |
| **Indirect materials:** | | R700 | |
| Packaging | 500 | | |
| Cleaning materials for factory | 200 | | |
| **Indirect labour:** | | R1 700 | |
| Wages for factory cleaning staff | 200 | | |
| Salary for factory foreman | 1 500 | | |
| **Total indirect costs (labour and materials)** | | | R2 400 |
| **Overheads:** | | | R2 500 |
| Insurance | | 1 500 | |
| Rent | | 1 000 | |
| **Total production cost** | | | **R12 250** |

## TASK 12.6 Penjam Pants: Management and financial accounting

| 12.6.1 James - Production | 12.6.2 Penny – Accounting |
|---|---|
| How much to pay factory workers | Calculate profit or loss |
| Calculating overtime for factory workers | Balance sheet |
| Cost of running the factory | Changes in capital |
| Cost of fabric for shorts | Checking on how the money is used |
| Targets for production | Decisions on purchasing equipment and vehicles |
| Setting a budget for the factory | Taxation |
| Stock control | Interpreting of financial accounts |
| Break-even point for production | |
| Cost of zips and buttons for shorts | |
| Using costs for making business decisions | |
| Product life cycle | |
| | |

## TASK 12.7 Penjam Clothing (2): Management and financial accounting

| 12.7.1 James - Production | 12.7.3 Penny - Accounting |
|---|---|
| **Outside:** | **Outside:** |
| Suppliers | Customers |
| Salespeople | Bank |
| Wholesalers | Investors |
| Retailers | Chamber of Commerce |
| Labour Union officers | Suppliers |
| Transport companies | Receiver of Revenue |
| | |

| 12.7.2 James - Production | 12.7.4 Penny - Accounting |
|---|---|
| **Inside:** | **Inside:** |
| Factory workers | Bookkeeper |
| Labour union representative | Receptionist |
| Administration department | Factory management |
| Management | Cashier |
| | Management |
| | |

## TASK 12.8 ⌘ Penjam Clothing (3): Management and financial accounting

| | |
|---|---|
| **12.8.1** | Financial Accounting:<br>To manage, control and analyse the financial position of the business through income statements, balance sheets and cash flow statements; to procure loans and additional capital and to control income and expenditure. |
| **12.8.2** | Management Accounting:<br>To draw up budgets, check costs in order to define goals; calculate break-even point and analyse the variances to ensure the best productivity for the business. |

## TASK 12.9 Pinetown Shoe Factory: Internal control processes in a manufacturing business

| | |
|---|---|
| **12.9.1** | YES. She should be concerned. This situation creates the opportunity for the secretary to engage in dishonest practice if she wants to. |
| **12.9.2** | The owner should have a meeting with her financial advisors ( bookkeeper and internal auditors) as soon as possible and separate the duties of her secretary.<br>The owner of Pinetown Shoe Factory should employ another person to issue cheques. |
| **12.9.3** | It will then be easier for persons to be accountable for the specific aspect of work undertaken by each. Where there is no internal control, fraud and dishonest practices can take place. |

## TASK 12.10 Inanda Manufacturers: Ethical behaviour in a manufacturing environment

| | |
|---|---|
| **12.10.1** | 40% of ( R850 000 + R925 000) = R710 000 |
| **12.10.2** | The local suppliers in Pretoria and East London will have a decrease in their sales. This might result in these suppliers retrenching some or most of their staff. This results in unemployment for these workers and subsequent financial hardship on their families. |
| **12.10.3** | YES – human rights issue is a major factor in the modern world. Most people strongly dislike exploitation and use of child labour. It is also against the law. In the short term, Inanda Manufacturers may benefit financially but in the long term they might lose more business when people refuse to buy their products. |

**NOTE TO TEACHER:**

The following notes and tasks are optional and for enrichment purposes and has not been included in the learner's book.
Teachers may want to use some of the following material for classwork, projects or assignments.

## TASK 12.11 Creative Concrete Products: Cost calculations

Creative Concrete Products make a variety of concrete products for garden use. The factory makes 12 tables per month.

**Information – Factory costs:**

| | | |
|---|---|---|
| Cement | R38.00 per bag | 3 bag = 12 tables |
| Sand | R30 @ ½ $m^3$ | Makes 12 tables |
| Stone | R30 @ ½ $m^3$ | Makes 12 tables |
| Water | 200ℓ no charge | For 12 tables |
| Paint | 5ℓ @ R120 | ½ℓ per table |
| Labour | R15.00 per hour | 4 hours = 1 table |
| Rent | R4 000 per month | |
| Electricity | R500 per month | |
| Foreman's salary | R5 400 | |
| Sundry expenses | R790 | |
| Cleaning materials for factory | R300 | |
| Telephone | R1 100 | |

**Required:**

12.11.1 Calculate the direct materials cost and direct labour cost for one month in which they made 12 tables.
12.11.2 Make a list of the overhead expenses.
12.11.3 Calculate the total production costs for 12 tables.
12.11.4 How much will 1 cement table cost?
12.11.5 If they make 100% profit, how much will they sell each table for?
12.11.6 Do you think this is a realistic selling price for a cement table? Explain.

## TASK 12.12 Woody Woodpecker CC: Basic cost calculations

Woodie Woodpekker CC makes wooden tables and chairs for outdoor use. The factory target is 230 tables a month.

**Information:**

The following materials are required to make 1 table.

| | | |
|---|---|---|
| Wood | R8 per metre | 10 slatted pieces x 1.8 m |
| | R10 per metre | 6 square pieces x 2 m |
| Brass screws | R1.50 per pkt of 25 | 1 packet |
| Sand paper | R4 per sheet | 3 sheets |
| Varnish | 500 ml | R15 x 500 ml |
| Labour | Rate = R18 per hour | 5 hours labour for 1 table |
| Equipment | Cost price R67 000 | |
| Factory Insurance | R2 000 per month | |
| Rent | R5 000 per month | Factory R3 000<br>Administration block R2 000 |
| Consumable stores | R150 | Gloves, dust masks, vacuum cleaner bags |
| Cleaning aids | R100 | Hand cleaner, varnish remover |
| Manager | R10 000 per month | |
| Receptionist | R3.500 per month | |
| Factory manager | R7 000 per month | |
| Factory cleaner | R1 800 per month | |

**Required:**

12.12.1 Calculate the direct materials cost and direct labour cost for 1 table.
12.12.2 Calculate the direct materials cost and direct labour cost for 230 tables.
12.12.3 Make a list of the overhead costs.
12.12.4 Calculate the total production costs for 230 tables.
12.12.5 How much will one wooden table cost?

12.12.6 If they make 30% profit, how much will they sell each table for?
12.12.7 Do you think this is a realistic selling price? Explain.
12.12.8 Why is equipment not included in direct or indirect costs?

# FIXED AND VARIABLE COSTS

Another method of analysing costs is to divide the costs into fixed and variable. This method is used to calculate the break-even point. This is the point when the number of items or products made and sold covers the costs. It is only after this point that the business will start making a profit.

## FIXED COSTS

These costs, are as the word indicates, fixed. This means that they do not change when the number of products made changes.

## TASK 12.13 Penjam Clothing (4): Application of cost principles

Penjam Clothing pays R3 000 each month to rent the premises where they make T-shirts. Their aim is to make 500 T- shirts a month. In February, they made 490 items, March they exceeded their target and made 550 shirts. However, in April there were a lot of public holidays with the Easter weekend and some other public holidays. During April they only managed to make 300 items.

12.13.1 Complete the following table:

| Month | No. of items made | Rent paid |
|---|---|---|
| February | | |
| March | | |
| April | | |

12.13.2 Write a description for fixed costs using your own example.
12.13.3 Draw a graph to depict the fixed costs using the information from above.

## VARIABLE COSTS

Variable costs vary according to the number of products that are made. These costs are the total opposite to fixed costs. Variable costs are directly linked to the product being made and are often the same as direct materials and direct labour that we learnt about earlier in this module.

## TASK 12.14 Penjam Clothing (5): Application of cost principles

Penjam Clothing needs the following items to make their T-shirts:

| | |
|---|---|
| Fabric | 0.75 cm @ R8 per metre |
| Cotton thread | 200 cm @ R3.50 for 1000m |
| Screen-printing | R5.00 |
| Packaging | R1.00 |
| Labels | R2.20 |
| Machinist | R18.75 per hour |
| 1 Hour | = 3 T-shirts |

**Required:**

12.14.1 Complete the following table:

| Item | Cost for 1 T-shirt | Cost for 50 items | Cost for 500 items |
|---|---|---|---|
| Fabric | | | |
| Cotton thread | | | |
| Screen printing | | | |
| Packaging | | | |
| Labels | | | |
| Labour | | | |
| **Total Variable costs** | | | |

12.14.2 Why does the total variable cost change as more items are made?
12.14.3 Write a description for variable costs using your own example.
12.14.4 Draw a graph representing the variable costs.

## TOTAL COST

The total cost of a product will be the fixed costs plus the variable costs.

## TASK 12.15 Penjam Clothing (6): Application of cost principles

12.15.1 Use the information in tasks 12.13 and 12.14, and complete the following table:

| Costs | 1 item | 100 items | 500 items |
|---|---|---|---|
| Fixed costs | | | |
| Variable costs | | | |
| **Total costs** | | | |

12.15.2 How much will it cost to produce ONE T-shirt if :
(a) 1 T-shirt is made in a month
(b) 100 T-shirts are made in a month
(c) 500 T-shirts are made in a month
12.15.3 Why is there such a big difference in the unit cost between producing 1 and 500 in a month?
12.15.4 How will this affect profit made by Penjam Clothing?

## TASK 12.16 Adjusting product content

Read the article below and answer the questions which follow.

**Confectioners solve the cocoa & sugar price woes** *Sunday Tribune,13 Feb 2011*

Nestlé SA have plucked an antidote to higher cocoa and sugar prices out of thin air. Nestlé will spend $24 million to promote Aero bubbly chocolate in the UK and Ireland this year, the most in the brand's 75 year history. Cocoa prices have risen 18% since November 2009 due to the concern over the elections in the Ivory Coast, the world's biggest cocoa supplier.

"More air in chocolate is one way to save on the cost of a chocolate bar," said Jon Cox in Zurich. Refined sugar has reached $857 a metric ton on February 2, the highest since at least January 1989, making the traditional solution of adding sugar to chocolate less profitable. Sugar is about four times cheaper than cocoa, and it has become the biggest ingredient in cheaper brands. Chocolate makers say air bubbles make the product creamier, more textured and lower in calories.

"Air equals less calories, and you can actually sell that," said James Amorosa, a food industry consultant based in Switzerland. "It's a double-whammy: if you got something light and it has a really nice mount feel, you make money with that."

There is absolutely no relation between low-end chocolate and aeration, said Nicole Heremans, a spokeswoman at the Zurich-based company, which makes chocolate for Nestlé, Hershey and Kraft Foods. She said chocolate makers aerate to make the bars different and reduce calories.

Chocolate density can be cut by as much as half by using carbon dioxide or nitrous oxide to make bubbles, Beckett said. Still, he said chocolate makers would have more pricing power if they found ways to add water to chocolate because most bars are priced by weight. Chocolate makers can reduce the density of chocolate through 'micro-aeration' with nitrogen by as much as 10% before consumers even notice, he added. Companies have tweaked recipes for decades to make cheaper mass-market treats. Aero was the first aerated chocolate bar in 1935.

**Required**:

12.16.1 Why would Nestlé be concerned about high prices of cocoa and sugar?

12.16.2 What is Nestlé planning to do to counteract the increased prices of cocoa and sugar?

12.16.3 John says that Nestlé's plan is neither acceptable nor ethical. Jane feels that their plan is acceptable and ethical. Provide an explanation to support John's opinion, and one to support Jane's opinion.

12.16.4 If you were the CEO of Nestlé, would you implement this plan? Explain.

# SUGGESTED ANSWERS

## TASK 12.11 Creative Concrete Products

**12.11.1**

| | |
|---|---|
| **Direct material cost:** | 318 |
| Cement (R38 x 3) | 114 |
| Sand | 30 |
| Stone | 30 |
| Water | 0 |
| Paint (R120 ÷ 10 x12) | 144 |
| **Direct labour cost** | 720 |
| Labour | 720 |
| **Prime cost** | **R1 038** |

**12.11.2**

| | |
|---|---|
| **Overheads:** | |
| Telephone | R1 100 |
| Sundry expenses | 790 |
| Electricity | 500 |
| Rent | 4 000 |
| | |

**12.11.3 PRODUCTION COSTS**

| | |
|---|---|
| **Direct material cost:** | 318 |
| Cement (R38 x 3) | 114 |
| Sand | 30 |
| Stone | 30 |
| Water | 0 |
| Paint (R120 ÷ 10 x12) | 144 |
| **Direct labour cost** | 720 |
| Labour | 720 |
| **Prime cost** | 1 038 |
| **Total indirect costs** | 5 700 |
| **Indirect material** | 300 |
| Cleaning materials | 300 |
| **Indirect labour** | 5 400 |
| Foreman's salary | 5 400 |
| **Overheads** | 6 390 |
| Telephone | 1 100 |
| Sundry expenses | 790 |
| Electricity | 500 |
| Rent | 4 000 |
| **TOTAL PRODUCTION COST** | **R13 128** |

| | |
|---|---|
| **12.11.4** | Total production cost = R13 128 = R1 094<br>No. of units 12 |
| **12.11.5** | R1 094 + 100% = R2 188 |
| **12.11.6** | Use discretion with learners' answers. Learners should remember from Grade 9 that market research and competitor research would provide an answer as to whether this is realistic. It is important that they justify their answer - give reasons for their answer. |

## TASK 12.12 Woody Woodpecker CC

**12.12.1** Total prime cost for one table = R382.50

| | |
|---|---|
| **Direct material cost** | 292.50 |
| Wood (10 x 1.8 = 18m x R8) | 144.00 |
| Wood (6 x 2m x R10) | 120.00 |
| Brass screws | 1.50 |
| Sand paper (3 x R4) | 12.00 |
| Varnish | 15.00 |
| **Direct labour cost** | 90.00 |
| 4 staff members (R18 x 5 hr) | 90.00 |
| **PRIME COST** | **R382.50** |

**12.12.2** Total prime costs for 230 tables R87 975.00

| | |
|---|---|
| **Direct material cost** | 67 275 |
| Wood (10 x 1.8 = 18m x R8) | 33 120 |
| Wood (6 x 2m x R10) | 27 600 |
| Brass screws | 345 |
| Sand paper (3 x R4) | 2 760 |
| Varnish | 3 450 |
| **Direct labour cost** | 20 700 |
| 4 staff members (R18 x 5 hr) | 20 700 |
| **PRIME COST** | **R87 975** |

**12.12.3** Overhead costs: Insurance R2 000
Rent R3 000

**12.12.4 PRODUCTION COSTS**

| | |
|---|---|
| **Direct material cost:** | 67 275 |
| Wood (10 x 1.8 = 18m x R8) | 33 120 |
| Wood (6 x 2m x R10) | 27 600 |
| Brass screws | 345 |
| Sand paper (3 x R4) | 2 760 |
| Varnish | 3 450 |
| **Direct labour cost** | 20 700 |
| 4 staff members (R18 x 5 hr) | 20 700 |
| **Prime cost** | 87 975 |
| **Total indirect costs** | 9 050 |
| **Indirect material** | 250 |
| Consumable stores | 150 |
| Cleaning aids | 100 |
| **Indirect labour** | 8 800 |
| Factory manager | 7 000 |
| Factory cleaner | 1 800 |
| **Overheads** | 5 000 |
| Insurance | 2 000 |
| Rent | 3 000 |
| **TOTAL PRODUCTION COST** | **R102 025** |

| | |
|---|---|
| **12.12.5** | Each table will cost R102 025 ÷ 230 = R443.59 |
| **12.12.6** | Selling price: R443.59 + 30% = R576.67 |
| **12.12.7** | Use discretion with learners answers. Learners must give reasons for their answer. |
| **12.12.8** | Equipment is an asset and not an expense to the business. |

## TASK 12.13 Penjam Clothing (4)

**12.13.1**

| Month | No. of items made | Rent paid |
|---|---|---|
| February | 490 | R3 000 |
| March | 550 | 3 000 |
| April | 300 | 3 000 |

**12.13.2** Fixed costs - these remain the same regardless of the number of products made and sold.

**12.13.3** Fixed costs graph:

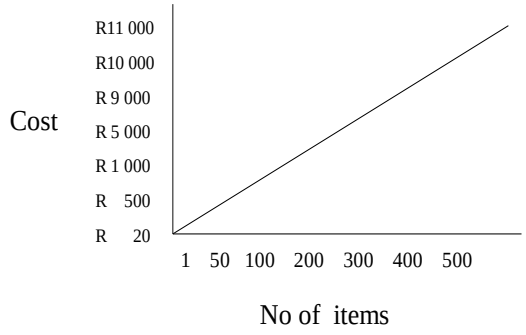
## TASK 12.14 Penjam Clothing (5)

**12.14.1**

| Item | | Cost for 1 T-shirt | Cost for 50 items | Cost for 500 items |
|---|---|---|---|---|
| Fabric | .75 x R8 | R6.00 | R300 | R3 000 |
| Cotton thread | .2 x R3.50 | 0.70 | 35 | 350 |
| Screen printing | R5.00 | 5.00 | 250 | 2 500 |
| Packaging | R1.00 | 1.00 | 50 | 500 |
| Labels | R2.20 | 2.20 | 110 | 1 100 |
| Labour | R18.75 ÷ 3 | 6.25 | 312 | 3 125 |
| **Total variable costs** | | **R21.15** | **R1 057** | **R10 575** |

| | |
|---|---|
| **12.14.2** | Variable costs change as more items are made because more raw materials and labour are needed. Use your discretion. |

**12.14.3**




## TASK 12.15 Penjam Clothing (6)

**12.15.1**

| Costs | 1 item | 100 items | 500 items |
|---|---|---|---|
| Fixed costs | R3 000.00 | R3 000 | R3 000 |
| Variable costs | R21.15 | R2 115 | R10 575 |
| **Total costs** | **R3 021.15** | **R5 115** | **R13 575** |

| | | |
|---|---|---|
| **12.15.2** | (a) 1 T-shirt | = R3 021.15 |
| | (b) 100 T-shirts - each will cost R5 115 ÷ 100 | = R51.15 |
| | (c) 500 T-shirts - each will cost R13 575 ÷ 500 | = R27.15 |
| **12.15.3** | The more T-shirts that are made in a month, the more the fixed costs are diluted. | |
| **12.15.4** | The more T-shirts that are made, the lower the cost - the bigger the profit margin without any change to the selling price | |

## TASK 12.16 Adjusting product content

Alternative valid responses acceptable

**12.16.1** Nestlé would be concerned about high prices of cocoa and sugar because it will affect the cost of producing their chocolates – this would drive the prices up and they might lose customers.

**12.16.2** Nestlé plans to aerate the chocolates more – with more air in the chocolates (like the Aero) it is a lighter chocolate, and costs should decrease.

**12.16.3** John would be correct if Nestlé's plans to hoodwink their customers by not telling them what is in the product and if they keep prices high to make a bigger profit. Jane would be correct if Nestlé places the specifications on the packet so that customers can make an informed choice to buy the product or not. The Aero line has done well, so presumably the customers like it.

**12.16.4** Yes, following Jane's argument. Aero is popular with customers. Something similar but different in terms of taste could expand market share, e.g. Aero has now been brought out in different flavours (Maybe learners can do a study on whether Aero chocolate is indeed cheaper than solid chocolate).

## CHECKLIST

| SKILLS | Yes – proficient | Requires more attention | Complete |
|---|---|---|---|
| Understand the difference between financial and managerial accounting | | | |
| Distinguish between direct and indirect labour | | | |
| Distinguish between direct and indirect materials | | | |
| Identify manufacturing overheads | | | |
| Calculate the unit cost of production | | | |
| Distinguish between fixed and variable costs | | | |