

## Examples of Applying Figure Sense in Managerial Accounting Problems

**Example 1:** A dog food company produces dry dog food and uses process costing to track costs. In the Mixing department, all ingredients are added at the beginning of the process and conversion costs are added evenly during the process. The following table has information for that past year.

WIP Inventory, Mixing on January 1 Units	0	Direct materials added to Mixing \$26,760	
Units started in Mixing during the year 12,000		Direct labor added to Mixing \$15,416	
Units completed	8,000	Manufacturing overhead applied to Mixing	\$9,000
WIP Inventory, Mixing on December 31	4,000		

Thus, the conversion costs for the year were  $\$15,416 + \$9,000 = \$24,416$ . At the end of the year, the WIP inventory were 80% complete. What amount of these conversion costs will be assigned to Cost of Goods Manufactured? What amount of these conversion costs will be assigned to the ending balance in Work In Process Inventory?

One issue in solving word problems is to understand the information that is given, to translate that information into accounting concepts and to use those concepts to figure out how to solve the problem. The following is an outline of how to use the figure sense habit of defining the problem so the student has a plan for how to solve the problem.

### **Figure Sense Habit: Define the Problem.**

*What do I know? or What information do I have to work with?*

*What do I want to accomplish?*

*What steps do I need to take to get from what I know to what I want to accomplish?*

#### **Step 1: What do I know?**

12,000 units were started during the year: 8,000 completed and 4,000 were 80% complete

Conversion costs = \$24,416

#### **Step 2: What do I want to find out?**

The amount of conversion costs assigned to Cost of Goods Manufactured.

The amount of conversion costs assigned to the ending balance in WIP inventory.

#### **Step 3: What do I need to do to get from what I know to what I want to find?**

a) Compute the following:

1. Total equivalent units for purposes of conversion costs: Physical Units x % of Cost Added to the Units

8,000 physical units completed and transferred out to the next process are equal to 8,000 equivalent units

4,000 physical units remaining in the ending balance of WIP are 80% complete = 3,200 equivalent units

Total equivalent units = 8,000 units completed and transferred out + 3,200 units left in WIP = 11,200 equivalent units for conversion cost purposes

2. Average conversion cost per equivalent unit: Total Cost / Total Equivalent Units

\$24,416 in total conversion costs divided by 11,200 equivalent units = \$2.18 per equivalent unit

b) Conversion costs assigned to Cost of Goods Manufactured = EU x Average Cost per EU (8,000 equivalent units completed and transferred out x \$2.18 per unit)

Conversion costs to WIP ending balance = EU x Average Cost per EU (3,200 equivalent units remaining in process x \$2.18 per unit)

**Figure Sense Habit: Look for unusual outcomes or exceptions.**

**Before solving the problem, ask: What do I expect the answer to be?**

**After solving the problem, ask: Is the answer consistent with what I expected?**

**If you find it difficult to determine the expected answer: After solving the problem ask: Does this answer make sense?**

**What do I expect the answer to be?**

Of the 12,000 units started this year, 2/3 (8,000) were completed, and 1/3 (4,000) are in WIP ending inventory. Thus a rough estimate is that 2/3 of the \$24,416 conversion cost will be assigned to COGM and 1/3 of the \$24,416 will be assigned to WIP inventory

$(2/3) * (\$24,416) = \$16,277$  estimated for COGM

$(1/3) * (\$24,416) = \$8,139$  estimated for WIP inventory.

**Solve the problem:**

First compute the equivalent units for assigning conversion costs.

	Equivalent Units for Conversion Costs
Units Completed & Transferred Out (COGM)	8,000
Units Remaining in Ending WIP (EB)	$(4,000) * (.80) = 3,200$
Total Equivalent Units	11,200

Cost of Goods Manufactured =  $(\$24,416) \times (8,000) / (11,200) = \$17,440$

Costs to Ending balance of WIP =  $(\$24,416) \times (3,200) / (11,200) = \$6,976$ .

**This is consistent with what was expected.**

**Example 2:** Stephen's Scooters sells two version of a motorized scooter: standard and chrome. Monthly fixed expenses are \$153,000. The standard scooter sells for \$650 with a variable cost per scooter of \$500. The chrome scooter sells for \$750 with a variable cost per scooter of \$550. Three out of every five scooters sold are standard and two out of every five sold are chrome. How many of each type of scooter does Stephen need to sell to break even?

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**Step 1: What do I know?**

Fixed expenses each month are \$153,000

The profit for standard scooters =  $\$650 - \$500 = \$150$

The profit for chrome scooters =  $\$750 - \$550 = \$200$

60% of the sales are standard scooters and 40% are chrome scooters.

**Step 2: What do I want to find out?**

How many of each type of scooter needs to be sold to break even – so the profit = \$153,000

**Step 3: What do I need to do to get from what I know to what I want to find?**

- a) Compute the weighted profit per scooter when 60% are standard scooters and 40% are chrome scooters.
- b) Compute the number of scooters to make a profit of \$153,000 =  $N$  scooters
- c) Number of standard scooters =  $.6*N$     Number of chrome scooters =  $.4*N$

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**What do I expect the answer to be?**

How many standard and chrome scooters need to be sold to break even?

Stephen makes \$150 profit on standard scooters and \$200 profit on chrome scooters. I estimate his average profit per scooter to be \$175. To break even he needs to sell approximately  $\$153,000/\$175 = 875$  scooters (rounded up). If 60% of there are standard and 40% chrome then,

$$\text{Estimated standard scooters} = (875) * (.6) = 525$$

$$\text{Estimated chrome scooters} = (875) * (.4) = 350$$

**Solve the problem:**

	Standard Scooter	Chrome Scooter	Total
Profit per unit	$\$650 - \$500 = \$150$	$\$750 - \$550 = \$200$	
Sales Mix Proportion	$3/5 = .60$	$2/5 = .40$	
Weighted Average Profit per Unit	$(\$150) * (.60) = \$90$	$(\$200) * (.4) = \$80$	$\$90 + \$80 = \$170$

With an weighted profit margin per unit of \$170, the number of units needed to be sold to break even =  $(\$153,000)/(\$170) = 900$  units.

$$\text{Standard scooters sold to break even} = (900) * (.6) = 540$$

$$\text{Chrome scooters sold to break even} = (900) * (.4) = 360$$

**This is consistent with what was expected.**

**Example 3:** Miller Manufacturing is preparing cash budgets for the first two months of the next quarter (April and March). Your manager wants to know the total projected cash receipts for April, the total projected cash receipts for May and the projected balance of Accounts Receivable at the end of May. The actual Sales Revenue for March was \$55,000, the projected Sales Revenue for April is \$60,000, and the projected Sales Revenue for May is \$68,000. Seventy percent of sales are cash and thirty percent of sales are credit. Twenty percent of credit sales are collected in the current month and the remainder in the month after the sale.

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*What do I know? or What information do I have to work with?*

*What do I want to accomplish?*

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**Step 1: What do I know?**

Sales revenue for March = \$55,000

Projected sales revenue for April = \$60,000

Projected sales revenue for May = \$68,000

70% of sales are cash and 30% of sales are credit

20% of the credit sales are collected in the current month and 80% are collected in the next month

**Step 2: What do I want to find out?**

Projected cash receipts for April

Projected cash receipts for May

Projected Accounts Receivable balance at the end of May

**Step 3: What do I need to do to get from what I know to what I want to find?**

- 1) Determine the cash sales and the credit sales from the given sales revenues each month. (70% cash and 30% credit).
- 2) Determine the percent of credit sales that are collected each month from the total credit sales for the month (20% collect for the current month and 80% collected for the next month).
- 3) Combine the cash sales for each month, the credit sales collected in the current month and the credit sales collected from the previous month's credit sales.
- 4) Compute the accounts payable for the end of May (80% of May's credit sales).

Organize the information that is known:

Month	Sales Revenue	Cash Sales- 70% of revenue	Credit Sales – 30% of revenue	Cash on credit sales – 20% of credit sales	Ending AR – 80% of credit sales
March	\$55,000				
April	\$60,000				
May	\$68,000				

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**What do I expect the answer to be?**

Cash receipts for April: I expect the cash received to be slightly less than the April sales revenue since the money from the credit sales for March that comes in in April will be less than the money that from credit sales in April that is not collected in April. My expectation is around \$58,000.

Similarly cash receipts for May should be slightly less than the sales revenue in May. I estimate this around \$65,000.

Ending Accounts Receivable in May: Credit Sales will be about  $\$70,000(.3) = \$21,000$ . Thus AR for May will be about  $\$20,000(.8) = \$16,000$

**Solve the problem:**

Beginning with the table above, the bold entries are filled in.

Month	Sales Revenue	Cash Sales- 70% of revenue	Credit Sales – 30% of revenue	Cash on credit sales – 20% of credit sales	Ending AR – 80% of credit sales
March	\$55,000	<b>\$38,500</b>	<b>\$16,500</b>	<b>\$3,000</b>	<b>\$13,200</b>
April	\$60,000	<b>\$42,000</b>	<b>\$18,000</b>	<b>\$3,600</b>	<b>\$14,400</b>
May	\$68,000	<b>\$47,600</b>	<b>\$20,400</b>	<b>\$4,080</b>	<b>\$16,320</b>

The cash receipts for April and May are in the following table.

	April Cash	May Cash
March Sales of \$55,000	\$13,200	
April Sales of \$60,000	$\$42,000 + \$3,600 = \$45,600$	\$14,400
May Sales of \$68,000		$\$47,600 + \$4,080 = \$51,680$
Total	\$58,800	\$66,080

Projected cash receipts in April = \$58,800

Projected cash receipts in May = \$66,080

Projected Accounts Receivable in May = \$16,320

**This is consistent with what was expected.**



**Example 4:** Cool Logos buys logo-imprinted merchandise and then sells it to university bookstores. Expected sales are listed below. Cool Logos sets its sales price to earn an average gross profit on sales of 40%. The company does not want inventory to fall below 15% of the next month's cost of goods sold. Cool Logos expects other operating expenses to be \$300,000 per month. Prepare a purchases budget and budgeted income statement for the months of May and June.

Month	Estimated Sales	Estimated COS	15% of Estimated COS
April	\$2,006,000		
May	\$2,240,000		
June	\$2,381,000		
July	\$2,570,000		

**Figure Sense Habit: Define the Problem.**

*What do I know? or What information do I have to work with?*

*What do I want to accomplish?*

*What steps do I need to take to get from what I know to what I want to accomplish?*

**Step 1: What do I know?**

Estimated Sales from the given table.

Expected Gross Profit = 40% of sales

There is a restriction that the inventory be larger than 15% of the next month's estimated cost of goods sold.

**Step 2: What do I want to find out?**

Amount to Purchase for May and June

Income statement for May and June

**Step 3: What do I need to do to get from what I know to what I want to find?**

1) Purchase cost = Cost of Sales – Beginning Inventory + Ending Inventory

To find this we need to compute the Cost of Sales, the Beginning Inventory and the Ending Inventory.

Cost of Sales = .6\*Estimated Sales

Assume the Beginning Inventory and Ending Inventory are equal to the 15% of next month's cost of sales.

2) To produce the income statement we need: Sales, Cost of Goods Sold, and Operating Expenses.

**Figure Sense Habit: Look for unusual outcomes or exceptions.**

*Before solving the problem, ask: What do I expect the answer to be?*

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**What do I expect the answer to be?**

For May the estimated sales = \$2,381,000 and the cost of goods is 60% of the estimated sales =  $(.6) * (\$2,381,000) = \$1,344,000$ . If we had no beginning or ending inventory, the purchases would be this value. Estimated purchases for May = \$1,344,000

Estimated purchases for June =  $(.6) * (\$2,381,000) = \$1,428,600$

I don't have an estimate of the income, after solving the problem, I will check the answer for reasonableness.

**Solve the problem:**

The table below has the estimated cost of goods sold and the target ending inventory in bold.

Month	Estimated Sales	Estimated COS = .6*Sales	15% of Estimated COS = desired inventory
April	\$2,006,000	<b>\$1,203,600</b>	<b>\$180,540</b>
May	\$2,240,000	<b>\$1,344,000</b>	<b>\$201,600</b>
June	\$2,381,000	<b>\$1,428,600</b>	<b>\$214,290</b>
July	\$2,570,000	<b>\$1,542,000</b>	<b>\$231,300</b>

Estimated Purchases

	May	June
Cost of Goods Sold	\$1,344,000	\$1,428,600
+ Ending Inventory	\$214,290	\$231,300
- Beginning Inventory	-\$201,600	-\$214,290
Estimated Purchases	\$1,356,690	\$1,445,610

For May the estimated amount of purchases = \$1,356,690

For June the estimated amount of purchases = \$1,445,610

**These are close to what was estimated.**

## Pro-forma Income Statements

	May	June
Sales Revenue	\$2,240,000	\$2,381,000
Cost of Goods Sold	(\$1,344,000)	(\$1,428,600)
Gross Profit	\$896,000	\$952,400
Operating Expenses	(\$300,000)	(\$300,000)
Net Income	\$596,000	\$652,400

These incomes look reasonable.