Healthy Spring Water Company
Problem Set

The objective of this assignment is to learn to evaluate potential price change decisions using the breakeven cannibalization formula ("breakeven sales change formula") in a variety of circumstances.

Assignment

Work through problems 1a, 1b and 1c before class. In addition, read problem 2; we will do that one together during class.

Guidelines:

- You do not need to submit your answers to these exercises, but be prepared to discuss your approach in class
- Feel free to work with your "study buddy" or other teams (in either section)

Situation:

The Healthy Spring Water Company sells bottled water for offices and homes. The price of the water is $20 per 10-gallon bottle and the company currently sells 2,000 bottles per day. Following is the company's income and costs on a daily basis:

Sales revenue	$40,000
Incremental variable cost	$16,000
Non-incremental fixed cost	$20,000

Note: you can assume that variable costs are constant so that the average of them is also the variable cost relevant for a change in sales.

You can calculate the change in sales volume necessary for the price change to be profitable by using the Breakeven Sales Change formula:

$$\text{\% BE Sales Change (with a Change in VC)} = \frac{-\text{Change in CM}}{\text{CM} + \text{Change in CM}}$$

$$= \frac{-(\text{Change in Price} - \text{Change in VC})}{\text{CM} + (\text{Change in Price} - \text{Change in VC})}$$

Notice that when the change in variable costs is zero, this formula simplifies to

$$\text{\% BE Sales Change (Basic Calculation)} = \frac{-\text{Change in Price}}{\text{CM} + \text{Change in Price}}$$

The easiest way to do this calculation is in units of currency (e.g., dollars). If you use percent for the changes, the change in CM or VC must be stated as a percent of the original price, not as a percent of the original contribution margin or variable cost.

Problem 1a

The company is enjoying stable demand with its current pricing, but management is looking for ways to increase profitability. One suggestion is that the company reposition its water as a premium product, justifying a higher price. If successful, the company believes that it could charge 20% more for its water than it does now.

- **1a-1:** What is the maximum sales loss (in % and units) that Healthy Spring could tolerate before a 20% price increase would fail to make a contribution to profit? (That is, what is the basic breakeven sales change?)
- **1a-2:** By how much would Healthy Spring's contribution increase if its sales declined by 15% following the price increase?

Problem 1b

For Healthy Spring to reposition itself as a premium water, management believes that it will need to upgrade the packaging of its product. The company will deliver the water in glass rather than plastic bottles and the bottles will have to be "safety sealed" to ensure their cleanliness until the covering is removed in the customer's home. These changes will add $1.00 per bottle to the variable cost of sales.

- **1b:** Given this increase in variable cost, what is the maximum amount of sales that Healthy Spring could afford to lose and still profit from repositioning its water at a 20% higher price?

Problem 1c

While variable costs are always incremental for a price change, some fixed costs may be incremental as well. For example, if a lower price requires more production capacity that involves semifixed costs, or if a higher price would enable the firm to sell off (or avoid building) some capacity that involved semifixed costs, then those costs would be incremental to the pricing decision. Fixed costs, however, cannot be included when calculating the contribution margin to calculate the basic breakeven sales change, because they are not relevant for producing all units.

To ensure that a price change adequately reflects the increase or decrease in fixed costs that would result, one must add an additional term to the breakeven sales quantity calculation:

$$\text{Unit BE Sales Change (with Incremental FC)} = \text{Unit BE Sales Change} + \frac{\$ \text{ Change in Fixed Costs}}{\text{New } \$ \text{ CM}}$$

The percentage Breakeven Sales Change can be calculated simply by dividing the unit sales change by the initial sales level, or may be calculated more directly with the following expression:

$$\% \text{ BE Sales Change (with Incremental FC)} = \% \text{ BE Sales Change} + \frac{\$ \text{ Change in Fixed Costs}}{\text{New } \$ \text{ CM} \times \text{Initial Sales}}$$

- **1c:** To reposition its water as a premium product, Healthy Spring will require an increase in its advertising and promotion budget of $900 daily. What is the maximum sales loss that Healthy Spring could tolerate before a 20% price increase would fail to increase its net profit? (That is, what is the breakeven sales change, including the incremental fixed cost of the advertising campaign?)

Problem 2 – Facing New Competition

For many years, the Healthy Spring Water Company's sales grew rapidly, in part due to their brilliant advertising campaign. More recently, however, the company's sales have begun to flag. The problem is that the market for spring water grew large enough that grocery stores began to carry it, at prices somewhat below those of Healthy Spring. Consequently, the grocery stores are enjoying most of the benefit of continued growth in this market.

The management of Healthy Spring is considering whether a 10% price cut might be justified to renew its competitiveness in this market. At present, the company's capacity to deliver water fully utilizes its five delivery trucks. To serve more customers, the company would have to add one or more additional trucks and drivers. Each truck could deliver up to an additional 400 bottles daily, at a daily operating cost (including wages, depreciation, fuel, and maintenance) of $500.

Following is a recap of the company's current operating data:

Price	$20 per bottle
Sales	2,000 units
Sales revenue	$40,000
Incremental Variable cost	$16,000
Non-incremental Fixed cost	$20,000

- **2a:** What is the minimum sales gain that this company would require to make a 10% price cut profitable?
- **2b:** If the actual sales gain following the 10% price reduction were 700 bottles per day, what would be the Change in Profit resulting from the price change?