

Math-in-CTE Lesson Plan

Lesson Title: Costing	Lesson 02
Occupational Area: FACS	
CTE Concept(s): Finding the cost per serving and determining menu price	
Math Concepts: addition, division, percentages	
Lesson Objective:	The student will be able to accurately find the cost per serving. The student will be able to use the cost per serving to determine the menu price
Supplies Needed:	Food cost sheet
THE "7 ELEMENTS"	TEACHER NOTES (and answer key)
<p>1. Introduce the CTE lesson. Sell tootsie rolls for 2 for a penny at the beginning of class. Story: A child decided to open a "small store" in front of her house. In order to compete with the store on the corner, she needed to sell her penny candy for less than the store she bought it from. So she took her \$.25 allowance, bought 25 pieces of penny candy, and then sold it for 2 for \$.01. She sold out quickly but had a shock coming—does anyone want to guess why? What did she need to do? What would you have done differently? In the restaurant industry, the need to know how much something costs so that a price can be determined that would cover the cost of food, overhead, and profit. This is</p>	<p>This introduction is just to point out the need in a business to sell what they make at a profit. This is a true story about me.</p> <p>She LOST money – she had less than when she began</p>

<p>CRITICAL. Businesses that fail to do this go out of business quickly!! So what do you need to know in order to establish a fair price?</p>	<p>Need the actual cost of the item. Additional questions to assist students:</p> <ul style="list-style-type: none"> • What the customer is willing to pay? • What are the other factors that enter into the price? (Building, utilities, employees, incidentals) <p>Quantity needed The students do not need to name all of these but need to be aware that the cost of the items is influenced by many things.</p>
<p>2. Assess students' math awareness as it relates to the CTE lesson. You just went and got a hamburger at lunch and you paid \$1.29. This price needs to cover what?</p> <p>How much of the price of the hamburger was the cost of the food? In your groups, discuss, figure, and list the ingredients you ate, and then come up with a number. You have two minutes. How did you arrive at this number? What do you think you need to know to get to this number?</p>	<p>Building, utilities, employees, food, etc.</p> <p>This helps you determine how much they already know about how much of the price of a food items in a restaurant is generated by the cost of the food.</p>
<p>3. Work through the math example <i>embedded</i> in the CTE lesson. Example: Hamburger: \$1.79 per pound. (Small hamburgers use a #10 patty, meaning that you get 10 patties per pound.)</p> <p>Your meat was \$0.18 per patty. Buns cost – 8 for \$1.29 -- \$0.16 for the bun</p>	<p>$\\$1.79/10=\\0.18 per patty $\\$1.29/8=\\0.16 per bun</p>

<p>Pickles –\$0.01 a pickle—about \$0.03 total Catsup, mustard – about 1% of total My hamburger cost: \$0.16 (bun) + \$0.18 (hamburger) + \$0.03(pickles)= \$0.37 +4 (1% of total) = \$0.41 for food cost What % of the total is the food cost?</p> <p>So my hamburger really cost \$0.32, but I paid \$1.29 for it to cover all the other expenses in making it. In a restaurant setting, the price of the items on the menu is a very detailed job and needs to be done very carefully if the restaurant is going to be successful. Usually restaurants want their food cost at 33% or below. In order to accomplish this each recipe must be broken down into the cost of each ingredient. Then the total of all the ingredients are added together and divided by the number of servings. Do an example Muffin Recipe: 1 c. milk 2 c. flour 1 egg ½ c. sugar 3 t. baking powder ¼ c. melted butter ½ t. salt Makes 12 muffins</p>	<p>The industry standard for spices and flavoring is 1% of the total cost of the recipe</p> <p>$\\$0.37 \times .01 = \\0.037 rounded to \$0.04 $\\$0.41 / \\$1.29 = 0.317$ Rounded to 0.32=32%</p> <p>Muffins 1 c. milk: $(\\$1.92/1 \text{ gal}) / (16 \text{ cups/gal}) = \mathbf{\\$0.12}$ 2 c. flour: $\\$6.99/25 \text{ lbs.} = \\$0.28 \text{ per lb (which is 4 cups) / 2} = \mathbf{\\$0.14}$ 1 egg: $\\$0.99 \text{ a dozen} \rightarrow \\$0.99/12 \text{ eggs} = \mathbf{\\$0.08}$ ½ c. sugar: $\\$12.99/25 \text{ lbs.} = \\$0.52 \text{ per pound (2 cups per lb)} = (\\$0.26/1 \text{ cup}) \cdot \frac{1}{2} \text{ cup} = \mathbf{\\$0.13}$ 3 t. baking powder: $1 \text{ oz} / 12 \text{ t.}) \cdot (\\$0.31 / 1 \text{ oz})$ (approx. 12 t. per oz and cost is \$.31 per oz) = $\\$0.026 \text{ per t.} \cdot 3 \text{ t.} = \mathbf{\\$0.08}$ ¼ cup melted butter: $\\$2.50 \text{ per 2 cups, so} \rightarrow \\$2.50/2 \text{ c.} = \\$1.25/\text{c.} \cdot \frac{1}{4} \text{ c.} = \mathbf{\\$0.31}$ ½ t. salt: approx. $\mathbf{\\$0.01}$</p> <p>Cost of recipe: $\\$0.87 / 12 \text{ muffins} = \mathbf{\\$0.0725 \text{ per muffin}}$</p>
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What does this cost not include?

Lets try some examples to show you how they figure to price once they know what to cost of a serving is.

How much should our muffin cost if we make the food cost 25%?

You want your food costs to be a certain percentage of your menu price so we can set the equation up like this.

Percentage times menu price = food cost

We have a food cost of \$2.97, and we want this to be 30% of our menu price.

So we set up the problem like this

$$0.30 \cdot \text{menu price} = \$2.97$$

How do we get the menu price by itself?

$$\frac{0.30 \cdot \text{menu price}}{0.30} = \frac{\$2.97}{0.30}$$

$$\text{Menu price} = \$9.90$$

Because food costs are not always the same menu prices have to be increased to adjust for price variables.

So we might choose to charge \$10.50 or \$9.99, depending on how the ingredients in the recipe and their cost are subject to change.

Let us try another example:

In my restaurant, we have a dessert that costs \$1.45 to make per serving. How much should I charge on the menu in order for the food cost to be 25% of the menu price?

So:

Cost of baking, cupcake liners, labor, washing supplies, building, power, advertising

$$0.25 \cdot X = 0.0725$$

$$\mathbf{\$0.29 \text{ per muffin}}$$

$$25\% = \frac{25}{100} = 0.25$$

$$\frac{0.25 \cdot \text{menu price}}{0.25} = \frac{\$1.45}{0.25}$$

$$\text{menu price} = \frac{\$1.45}{0.25}$$

$$\text{menu price} = \$5.80$$

Now let us do an appetizer that has a food cost of \$3.75 for four serving, and we want it to be at a 33% food cost.

What would we need to do for our first step?

How do we figure out what each serving costs?

$$\frac{\$3.75}{4} = \$0.9375 \text{ (rounded to } \$0.94)$$

What is our next step?

$$\frac{0.33 \cdot x}{0.33} = \frac{\$0.94}{0.33}$$
$$x = \$2.85$$

Now if we short-cut this equation we just say:

Food cost per serving divided by percentage of the food cost we need will give us the menu price.

Percent • Menu Price = Food Cost

Is the equivalent to:

$$\frac{\text{Percent} \cdot \text{Menu Price}}{\text{Percent}} = \frac{\text{Food Cost}}{\text{Percent}}$$

<p>So, $\text{Menu Price} = \frac{\text{Food Cost}}{\text{Percent}}$</p> <p>Say: We often use a 33% Food Cost so, in the previous example, what would be a quick way to estimate to see if this answer is about right? (What would 3 times the food cost be?)</p>	
<p>4. Work through <i>related, contextual</i> math-in-CTE examples.</p> <p>If I am given a budget to feed a family of 4 for \$10, how would learning to cost a recipe help? What would I need to do to make sure I stayed in my budget?</p> <p>Or</p> <p>You are in charge of a banquet for 100 people. How much money would you ask for? What if your budget was \$300? How would you determine what you would make? Being able to do a food cost could help you how? What if you wanted to make a profit?</p>	
<p>5. Work through <i>traditional math</i> examples.</p> <p>See worksheet below.</p>	
<p>6. Students demonstrate their understanding.</p> <p>Using a recipe handed out and the worksheet with costing amounts:</p> <ol style="list-style-type: none"> 1. First, figure the cost of a serving. 2. Then, figure the menu price. 	

3. Determine what you would actually charge	
7. Formal assessment. Find one recipe with at least 5 ingredients, and figure the cost per serving and the menu price using a budget of no more than \$1.00 per serving. Make the recipe and plate one serving with the menu price using 33% as your food cost, and the class will vote if they would buy the item.	

NOTES:

Worksheet Answer Key:

Name _____ Date _____

1. What is 25% of 80? **20**
2. What percentage of 60 would 40 be? **67%**
3. \$.25 cents is 10% of what? **\$2.50**
4. A Pizza cost \$8.70 and will feed 6. How much does each person have to contribute to cover the cost of the Pizza? **\$1.45**