



## Lab 4.1: Milk Costs By the Gallon

The price you pay for milk at the store reflects many costs associated with producing, transporting, processing, packaging and storing the milk, from the cow on the farm to the grocery store shelf. In this lab, students will be looking at how changes in these costs reflect the final price paid for the milk while creating a visual of how costs are reflected in a gallon of milk.

### ***Needed Materials:***

- ⇒ 1 empty milk quart jug
- ⇒ Four (4) 16-ounce portions of colored sand (at least two different colors)
- ⇒ Funnel for jug
- ⇒ 1/2 and 1/4 cup measuring cups

Students should divide into groups of 4, and each group should be assigned to follow the directions for either Example 1 or Example 2. Find out which example you are to follow before beginning the experiment. The steps for Example 1 are below, and the steps for Example 2 are on page 2.

### **Example 1**

Cost	Dollar Value	Corresponding Measurement	Percentage of Total Costs
<b>Farm Costs</b>	\$0.375	3/4 cup	18.75%
<b>Transportation Costs</b>	\$0.250	1/2 cup	12.50%
<b>Processing Costs</b>	\$0.500	1 cup	25.00%
<b>Packaging Costs</b>	\$0.125	1/4 cup	6.25%
<b>Storage Costs</b>	\$0.125	1/4 cup	6.25%
<b>Retail Costs</b>	\$0.625	1 1/4 cup	31.25%
<b>Total Cost</b>	\$2.00	4 cups	100%

**Step 1:** In this exercise, sand will represent the costs associated with the price of milk. Each 1/4 cup of sand represents 12.5-cents. Translate the dollar values above to determine the measurement of sand that should represent each of the following costs associated with producing a gallon of milk.

**Step 2:** Now add the costs together and the measurements together to get the totals for each. Determine the percentage for each category.

**Step 3:** Now take the corresponding measurements to “create” the price of milk. Alternate the colors of the sand to represent each cost, and fill the milk jug up with the representative amount of sand for each cost, starting with farm costs and building up to retail costs.

**Step 4:** Use the graphic on the back of this page to draw a chart reflecting the different costs that go into the price of milk. Label the graph appropriately with the percentage listed for each cost.

**Step 5:** Compare your jug to one from Example 2 and write down reasons why your milk jug may appear differently than the other. What could have happened to create the difference?



## Lab 4.1: Milk Costs By the Gallon

### Example 2

**Step 1:** In this exercise, sand will represent the costs associated with the price of milk. Each  $\frac{1}{4}$  cup of sand represents 12.5 cents. Translate the dollar values below to determine the measurement of sand that should represent each of the following costs associated with producing a gallon of milk.

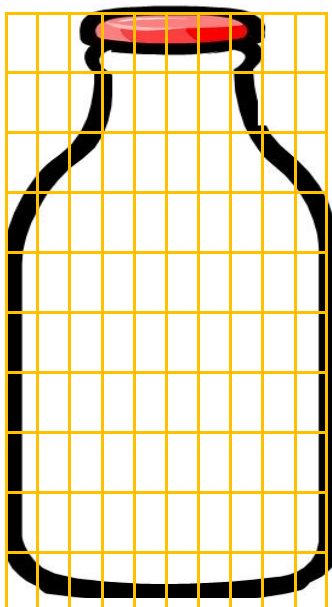
**Step 2:** Now add the costs together and the measurements together to get the totals for each. Determine the percentage for each category.

Cost	Dollar Value	Corresponding Measurement	Percentage of Total Costs
Farm Costs	\$0.375 cents	$\frac{3}{4}$ cup	15.79%
Transportation Costs	\$0.500 cents	1 cup	21.05%
Processing Costs	\$0.500 cents	1 cup	21.05%
Packaging Costs	\$0.125 cents	$\frac{1}{4}$ cup	5.26%
Storage Costs	\$0.250 cents	$\frac{1}{2}$ cup	10.53%
Retail Costs	\$0.625 cents	$1\frac{1}{4}$ cup	26.32%
Total Cost	\$2.00	$4\frac{3}{4}$ cup	100.00%

**Step 3:** Now take the corresponding measurements to “create” the price of milk. Alternate the colors of the sand to represent each cost, and fill the milk jug up with the representative amount of sand for each cost, starting with farm costs and building up to retail costs.

**Step 3:** Use the graphic below to draw a chart reflecting the different costs that go into the price of milk. Label the graph appropriately with the percentage listed for each cost.

**Step 4:** Compare your jug to one from Example 1 and write down reasons why your milk jug may appear differently than the other. What could have happened to create the difference?



### The Cost of A Gallon of Milk

Use the milk bottle to chart what percent of the total cost is represented in each category (farm, transportation, etc.) and label each category.

HINT: there are 100 blocks in the grid. Compare your bottle to the other example. What could have caused them to be different?

Difference: \_\_\_\_\_

What could have caused the difference:

---



---



---



---



## Lab 4.2: The Farmer's Role in the Community

Name: \_\_\_\_\_

In this activity, students will explore how money moves through a community. On average, **American farmers receive about 19 cents of every dollar the consumer spends on food.** The following role-playing scenario will demonstrate how the money moves through the economy and the local community.

**What you will need:**

*Role playing cards for each group*

*20 \$1 dollar bills (in play money) for each group of eight*

Walk through the steps below and record how much money moved through each person's hands on the "Money Exchanged Throughout a Community" chart found on page 2 of this worksheet. Once the chart is complete, total all of the dollars exchanged in the process, counting each exchange as one dollar.

### STEPS:

**Step 1:** Students should divide into groups of eight and assign a role to each person in group.

**Step 2:** Teacher should give the farmer the gallon milk jug, and give 20 \$1 bills to the consumer.

**Step 3:** The farmer hands the milk to the processor.

**Step 4:** The processor gives the milk to the grocery store owner.

**Step 5:** The grocery store owner gives the milk to the consumer.

**Step 6:** The consumer gives the 20 \$1 bills to the grocery store owner.

**Step 7:** The grocery store owner keeps \$7 and gives the rest to the processor.

**Step 8:** The processor keeps \$7 and gives the rest to the farmer.

**Step 9:** The farmer, processor and grocery store owner each give the employee \$1.

**Step 10:** The farmer, processor and grocery store owner each give the supplier \$1.

**Step 11:** The farmer, processor and grocery store owner each give the service provider \$1.

**Step 12:** The employee, supplier and service provider each give the tax collector \$1.

**Step 13:** The farmer, processor and grocery store owner each give the tax collector \$1.

### Recording Information:

Record how much money moved through each person's hands on the bar chart found on the back of this page. Once the chart is complete, total all of the dollars exchanged in the process, counting each exchange as one dollar. If you total all of the dollars exchanged in the process, it equals \$54 in economic activity generated by that \$20.

### Review:

Complete the questions below the chart on page 2 of this lab to summarize the exercise.



## Lab 4.2: The Farmer's Role in the Community

### Money Exchanged Throughout a Community

Shade in the bar chart below to indicate how much money each person receives in the process. The “Consumer” bar is shaded in as an example.



#### SUMMARY QUESTIONS:

1. How many different people received a share of the original \$20? \_\_\_\_\_
2. How much total money moved through the community if you add up all of the dollars? \_\_\_\_\_
3. How much money does the farmer have left after he pays everyone? \_\_\_\_\_
4. How much does the processor have left? \_\_\_\_\_
5. Who ends up with the most money? \_\_\_\_\_
6. Who ends up with the least amount of money? \_\_\_\_\_
7. How do you think this situation compares to real world scenarios? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



## Lab 4.2: The Farmer's Role in the Community

### FARMER

The farmer produces the milk to start the cycle and brings money back into the community.

**Amount of Money Received:**

---

### PROCESSOR

The processor takes the milk and makes a product out of it that people want to buy, increasing the dollar value of the milk.

**Amount of Money Received:**

---

### GROCERY STORE OWNER

The grocery store owner markets the product where people want to buy it, increasing the value of the product.

**Amount of Money Received:**

---

### CONSUMER

The consumer puts the money into the cycle by paying for the product made from the milk.

**Amount of Money Received:**

---

### SERVICE PROVIDER

The service provider provides a service for those making the product. For example, this could be a veterinarian on the farm or an engineer at the processing plant.

**Amount of Money Received:**

---

### SUPPLIER

The supplier provides goods to help make the product. On the farm, this could be the feed. At the plant, it could be product-wrapping material.

**Amount of Money Received:**

---

### EMPLOYEE

The employee helps the work get done and is vital to keeping the process moving.

**Amount of Money Received:**

---

### TAX COLLECTOR

The tax collector uses tax dollars to help the community do things like build new roads and make other improvements.

**Amount of Money Received:**

---