The Book Planter
FARM BUREAU NORTH CAROLINA
Ag in the Classroom
Post Office Box 27766 | Raleigh, NC 27611 | (919) 782-1705
ncagintheclassroom.com

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Ice Cream Everywhere: Sweet Stories from Around the World

Written by: Judy Campbell-Smith

Illustrated by: Lucy Semple

Everywhere you go, all around the world people are eating ice cream! And while some folks spoon up sundaes and some savor Syrian bouza—one thing is always true: ice cream is joy! Travel the globe and discover a mouthwatering selection of cold, creamy treats. Which one is your favorite?

Activity 1: A Day Without Dairy[1]

Students create, read, and interpret graphs relating to the economic importance of the dairy industry and are challenged to understand the economic consequences of a day without dairy.

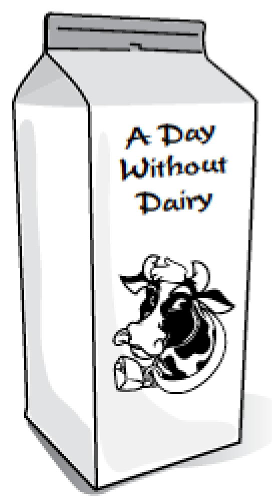
Materials

- A Day Without Dairy activity sheet
- A Day Without Dairy Activity Sheet Key
- Empty, clean, single-serving milk carton
- Graph paper

Procedures

1. Take a poll of the class to determine the students' favorite type of cheese: Mozzarella, American, Cheddar or Swiss. Create a chart on the board to record the students' responses to the poll. Ask the students what type of graph should be used to illustrate the information. Students can work in groups or as a class to create the appropriate graph.
2. Review with the students the purpose of graphs in displaying important information. A large part of an economist's job is collecting data, creating graphs and interpreting those graphs to determine changes in the market. Why would it be beneficial for someone in the dairy industry (or any other agriculture industry) to be interested in the changes within the agriculture market?
3. Explain that economists and dairy farmers alike use graphs to determine the importance of dairy product sales in the economy. In this lesson, students will create and read different graphs to better understand the role of dairy in our daily lives.

4. It may be helpful to work with students in creating a “word wall” of vocabulary words they will read and write during the lesson. Place definitions of challenging vocabulary words on the board, depending on the grade level. Pass out index cards featuring corresponding vocabulary words to each group. Have the groups take turns matching their vocabulary words to the correct definitions. Direct students to orally use the words in a sentence and/or record the definitions on a separate piece of paper.
5. Have the students complete the A Day Without Dairy activity sheet.
6. Discuss the economic impacts of a day without dairy. Work with the students to estimate the quantity of milk consumed daily in California (or substitute your state). For example, poll the class to determine the amount of dairy products the class consumes daily. Use multiplication to estimate the amount of dairy products consumed by the entire school, city, state, and country. Discuss with the class:
    - The amount of money lost in a day without dairy
    - The dairy industry’s impact on jobs and employment
    - The basic concept of supply and demand
    - If California stopped producing milk, how would we get dairy products? How would this affect prices at the store?
7. Review the activity. Have the students review their learning by creating “A Day Without Dairy” milk carton. Instruct the students to decorate a milk carton depicting newly-acquired concepts on each side. If time allows, they can make their carton colorful and creative.
    - **Side 1**
        - Title: A Day Without Dairy, Drawing, Name
    - **Side 2**
        - Answer the following question, using complete sentences, on lined paper. What would a day without dairy be like? A year? Paste your response to the milk carton.
    - **Side 3**
        - Paste a copy of the bar graph you created illustrating exports from the United States, Canada and Russia.
    - **Side 4**
        - On a separate piece of paper, list all vocabulary words learned, including definitions. Paste your list to the milk carton.



8. Variations:
    - Have the students create a chart reflecting the data graphed for cheddar cheese production in California (found on the A Day Without Dairy activity sheet). Using the chart they created, students find mean, median, mode and range.
    - Have the students work in groups to make milk carton review tools, substituting the pint-sized container with a half-gallon milk carton. Invite the students to summarize their findings in front of the class.

Activity 2: Milk Makin' Math[2]

Materials

- Milk Makin' Math Activity Book for each student
- Milk Makin' Math Answer Key
- Large piece of paper & markers for each group
- One-dollar bill
- Checkbook or sample of a check
- One or more photos showing the inside of a milk barn
- Feed Samples (optional)
- Syringe with needle removed
- Digital Scale
- Gallon of milk

Procedures

1. For this lesson groups of students (determined by the teacher) will rotate between six different learning stations. Each station should be set up with one table and chairs for each student in the group. Each station will focus on a different dairy career. Students will move around the room, completing math challenges found in each student's Milk Makin' Math Activity Book. Set up each of the stations as follows:
    - **Station 1: Dairy Nutritionist**, Visual: Samples of hay, dairy feed components. With each sample, include a label and definition.
    - **Station 2: Dairy Farmer**, Visual: One or more pictures showing the inside of a milking barn
    - **Station 3: Veterinarian**, Visual: A syringe with the needle removed
    - **Station 4: Accountant**, Visual: A checkbook to represent expenses and a dollar to represent profit. Using index cards, define and label each as profit or expense.
    - **Station 5: Safety Inspector**, Visual: A large weather thermometer that shows temperature in degrees Fahrenheit.
    - **Station 6: Marketing Manager**, Visual: Place one gallon of milk on a digital scale.
2. Instruct students who complete stations early to illustrate the cover of their activity book.
3. Review the answers to the problems with the entire class. Conclude the lesson with a class discussion on:
    - What are your impressions on the amount of math needed to be successful in your career?
    - Which career would you enjoy most? Why?
    - Which job is the most difficult? Why?
    - Which job is the easiest? Why?
4. On an index card, students write down one fact they learned about one of the possible dairy careers. Students will use this "ticket" to be excused for lunch, recess or a nutrition break.
5. Variations:

- Students move around in pairs. Students complete the math challenge together.
- Students create a dairy "passport." With each completed station, they receive a stamp to show their progress.

STUDENT PASSPORT					
Student Name:					
Station 1 Dairy Nutritionist	**Station 2** Dairy Farmer	**Station 3** Veterinarian	**Station 4** Accountant	**Station 5** Safety Inspector	**Station 6** Marketing Manager

Activity 3: Ice Cream in a Bag[3]

Materials

- Gallon-size re-sealable plastic bag
- Pint-size re-sealable plastic bag
- Kitchen towel
- 1/2 cup milk or half & half
- 1/4 teaspoon vanilla
- 1 tablespoon sugar
- Ice cubes
- 6 tablespoons rock salt

Procedures

1. Fill the large bag half full of ice. Add the rock salt.
2. Add the milk, vanilla, and sugar into the small bag.
3. Seal the small bag. (You can use two small bags to prevent leaking.)
4. Place the small into the large bag.
5. Seal the large bag.
6. Place the kitchen towel around the large bag.

7. Shake for 5 minutes or until the mixture turns into ice cream.
8. Enjoy!

Activity 4: Ice Cream Everywhere!

1. Tell the students to make a list of the countries as you read *Ice Cream Everywhere*. You may have to pause and ask the students to repeat the country back to you as you create a list on the board.
    - Note: It is a trip around the world that starts in Italy. From there, the reader visits Germany, Rwanda, Libya, Turkey, Jordan, India, Japan, New Zealand, Argentina, Cuba, and end up in the USA.
2. Provide a world map for the students. Ask them to shade the countries they visited. Then, have them create a path using a dotted line for their ice cream trip around the world.
3. Ask students create a map legend, using appropriate symbols with labels, colors, and patterns.
    - Symbols
        - Dotted line for the path they created
        - Directional symbols (North, South, East, West)
4. Ask students which new ice cream treat would they be most interested to try. Allow them to share out with the class and include their reasoning for their choice.

Sources

1. https://agclassroom.org/matrix/lesson/255/
2. https://agclassroom.org/matrix/lesson/117/
3. https://agclassroom.org/matrix/resource/1319/

K-5 Subject Areas: English Language Arts, Social Studies, and Math

English Language Arts

- RL.K.1 With guidance and support, identify a detail in a familiar text.
- RL.K.2 With guidance and support, identify the main topic of a familiar text.
- RL1.1 Identify details in a familiar text.
- RL.1.2 Identify the main topic and retell key details of a text.
- RL.2.2 Identify the main topic of text.
- RL.2.4 Identify words that relate to the topic of a text.
- RL.3.2 Identify the main topic and retell key details of a text.
- RL.3.4 Identify key words that complete sentences in a text.
- RL.3.5 Locate key facts or information in a familiar text.
- RL.4.1 Identify explicit details in an informational text.
- RL.4.4 Determine the meaning of words in a text.
- RL.5.1 Identify words in the text to answer a question about explicit information.

Social Studies

- K.B.1 Understand cultural practices in local communities and around the world.
- K.E.1 Analyze basic economic concepts.
- K.G.1 Apply simple geographic representations, tools, and terms to describe surroundings.
- 1.B.1 Understand how culture, values, and beliefs shape people, places, and environments.
- 1.C&G.1 Understand how people engage with and participate in the community.
- 1.E.1 Understand the role of basic economic concepts in the decisions people make.

- 1.G.1 Apply geographic representations, tools, and terms to describe surroundings.
- 2.E.1 Understand how the availability of resources impacts economic decisions.
- 3.E.1 Understand how economic decisions and resources affect the local economy.
- 3.G.1 Understand how geography impacts the development of regions and communities.
- 4.E.1 Understand how economic decisions and resources affect the economy of North Carolina.
- 4.E.2 Understand the impact of personal financial decisions.
- 5.E.1 Understand how economic decisions have impacted the United States in terms of consequence, growth, and trade.
- 5.E.2 Understand the impact of personal financial decisions.

Math

- 1.OA.8
- 1.NBT.2, 1.NBT.4
- 1.MD.4
- 2.OA.1
- 2.NBT.1, 2.NBT.3
- 2.MD.5, 2.MD.6, 2.MD.10
- 3OA.1, 3.OA.2, 3.OA.3, 3.OA.6, 3.OA.7, 3.OA.8
- 3.NBT.2
- 3.NF.1, 3.NF.2, 3.NF.4
- 4.NF.1, 4.NF.2, 4.NF.3, 4.NF.4, 4.NF.6, 4.NF.7
- 4.MD.4
- 5.NBT.5, 5.NBT.6, 5.NBT.7
- 5.NF.1, 5.NF.3, 5.NF.4, 5.NF.7

A Day Without Dairy

Bar Graph

On a separate piece of graph paper, create a bar graph comparing the amount of cheese, butter and nonfat dry milk exported from the United States, Canada and Russia in 2007.

Total Sales (in 1,000 metric tons)

	Cheese	Butter	Nonfat Dry Milk
United States	99	41	255
Canada	8	16	8
Russia	10	0	15

Determine the following. Round to the nearest tenth. Show all your work.

<u>Mean (average)</u>
Cheese:

Butter:

Nonfat Dry Milk:

<u>Median (middle)</u>
Cheese:

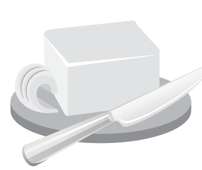
Butter:

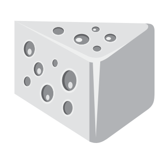
Nonfat Dry Milk:

<u>Range (span)</u>
Cheese:

Butter:

Nonfat Dry Milk:

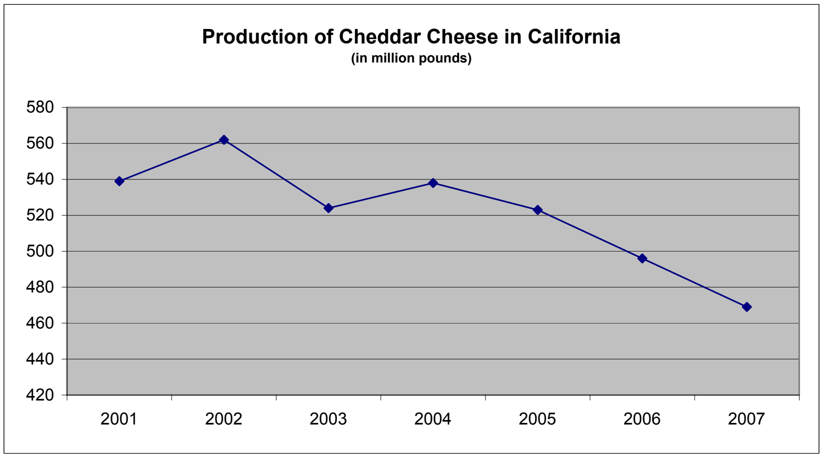




A Day Without Dairy

Line Graph

Interpret the line graph below to answer the following questions.



Given this line graph:

1. Summarize the production **trends** from 2001 to 2007.

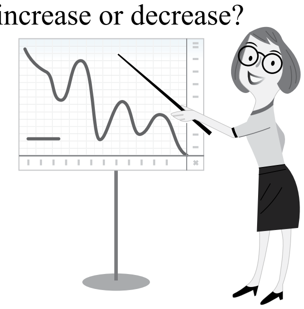
2. What year did the dairy industry experience the least amount of cheddar cheese production? How much did we produce that year?

3. What year did the dairy industry experience the greatest amount of cheddar cheese production? How much did we produce?

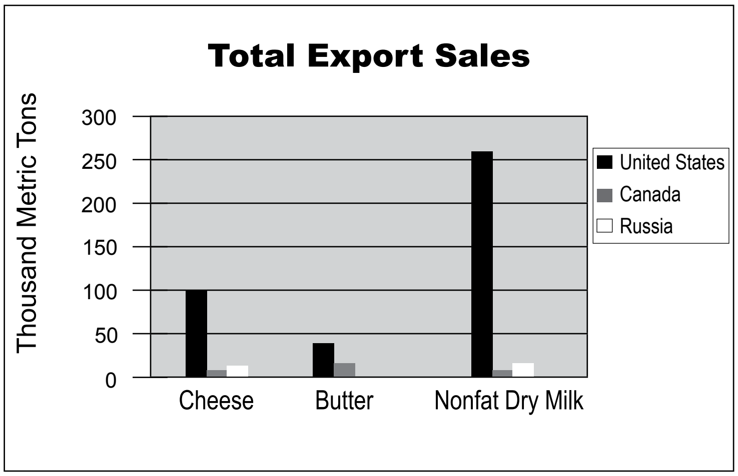
4. Predict if cheddar cheese production will increase or decrease in the future and why.

5. Between what two years did the greatest change occur? Was the change an increase or decrease?

6. Label the horizontal (x-axis) and vertical (y-axis) axes.



Bar Graph



Mean
a. Cheese: 39
b. Butter: 19
c. Nonfat Dry Milk: 92.6

Median
a. Cheese: 10
b. Butter: 16
c. Nonfat Dry Milk: 15

Range
a. Cheese: 91
b. Butter: 41
c. Nonfat Dry Milk: 247

Line Graph

1. There is an overall decreasing production trend from 2001 to 2007.
2. The dairy industry experienced the least amount of cheddar cheese production in 2007. We produced about 467 million pounds.
3. The dairy industry experienced the greatest amount of cheddar cheese production in 2002. We produced about 560 million pounds.
4. Based on the history of production, I predict it will decrease in the future.
5. The greatest change was between 2002 and 2003 when production decreased.
6. x-axis: Year; y-axis: Millions of Pounds

Milk Makin' Math Activity Book

Name

Milk Makin' Math

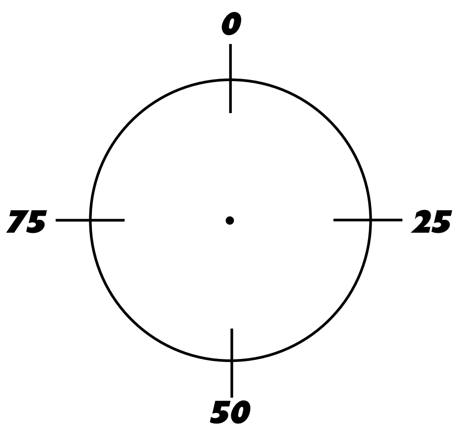
Station One: Dairy Nutritionist

A dairy nutritionist is an animal health professional who specializes in the nutritional needs of dairy cows. Nutritionists recommend the best diets for cows and monitor how cows respond to their feeding program.

	Percent	Decimal	Fraction
Hay			
Silage			
Almond Hulls			

1. A dairy nutritionist recommends feeding 60 pounds of feed to dairy cows every morning. The feed is a mix of hay, silage and almond pulp. The mix is 70 percent hay, 20 percent silage and 10 percent almond hulls. Represent each of these numbers in a percent, decimal and fraction form.

2. Create a pie chart using the percent quantities listed above. Color each ingredient of the feed a different color and include a color-coded key.



Key:

☐ =

☐ =

☐ =

3. Determine how many pounds of each ingredient to include in the feed. If 70 percent of the feed is hay and the feed weighs a total of 60 pounds, how many pounds of hay should you add? How many pounds of silage? How many pounds of almond hulls?

   Example: (percentage of ingredient in decimal form) x 60 = Total Pounds

   Hay ________ x 60 = ________

   Silage ________ x 60 = ________

   Almond Hulls ________ x 60 = ________

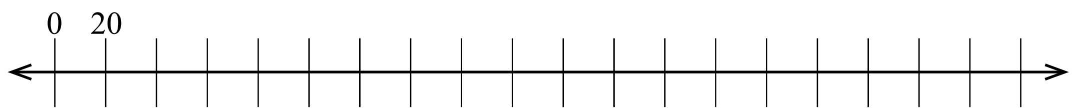
Milk Makin' Math

Station Two: Dairy Farmer

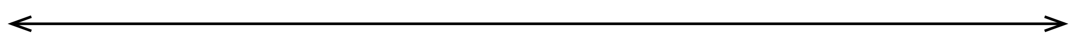
A dairy farmer is a farmer who specializes in raising dairy cattle, specifically for milk and/or cheese products.

It takes 10 minutes to milk one group of 20 cows. Answer the following questions and show your work by completing the number lines below.

1. How many minutes will it take to milk 120 cows? ________ Hours? ________



2. How many minutes will it take to milk 200 cows? ________ Hours? ________



3. How many minutes will it take to milk 235 cows? ________ Hours? ________

Milk Makin' Math

Station Three: Veterinarian

A veterinarian is a doctor who treats animals.

1. Part of a veterinarian's job is to protect animals from getting sick. That's why vets give animals shots. Veterinarians measure the amount of medicine to give a dairy cow in cubic centimeters, or cc's. A cc is a very small amount of liquid. Veterinarians also determine how much medicine to give an animal based on how much the animal weighs. Read the medicine label and determine how much medicine to give each of the following dairy cows.

Jersey	900 lbs.	________
Holstein	1,500 lbs.	________
Brown Swiss	1,400 lbs.	________
Guernsey	1,050 lbs.	________
Ayrshire	1,200 lbs.	________

Dairyman Dave's Pharmacy
Rx#: 123456

Give 10 cc's of medicine for every 50 lbs. of weight.

2. Would a human or a dairy cow need more medicine? Why?

____

____

____

____

____

____

____

____

Milk Makin' Math

Station Four: Accountant

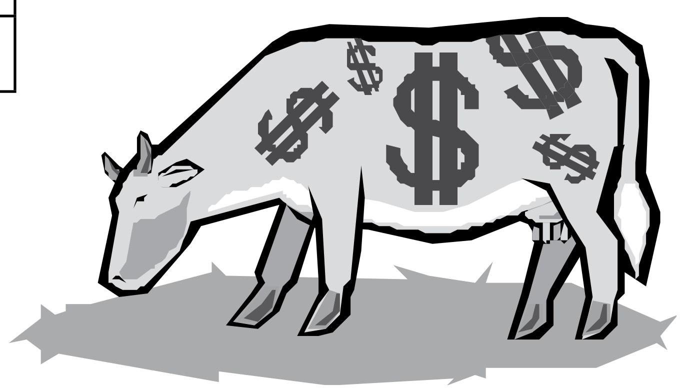
An accountant keeps records of business-related financial transactions. They record business expenses and calculate the profit earned.

1. If a dairy has a herd of 200 cows and each cow produces 10 lbs. of milk each day, how many total pounds of milk does the herd produce each day?

2. If a dairyman sells milk for $18.00 per 100 lbs. of milk, how much will he/she earn before expenses are calculated? Determine using the same herd as in Question #1.

3. Dairy farmers have many expenses in milk production. Using the expenses listed below, determine the total amount spent during the month.

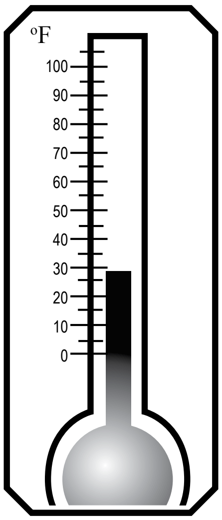
Expense	Amount
Labor	$5,423.12
Feed	$4,630.00
Vet Bills	$415.25
Repairs	$395.15
Supplies	$89.75
TOTAL	



Milk Makin' Math

Station Five: Safety Inspector

A safety inspector helps prevent harm to workers, property, the environment and the general public. Safety inspectors make sure the dairy products we consume are safe and healthy to eat. They also make sure the food we eat is free from germs and stored at the correct temperature.



1. Immediately after milking, the temperature of milk is 101° F. Within four hours, the safety inspector will check to make sure the temperature has dropped to 50° F. How many degrees will the milk need to drop every hour to meet this goal? Express your answer in degrees as a mixed fraction and as a decimal.

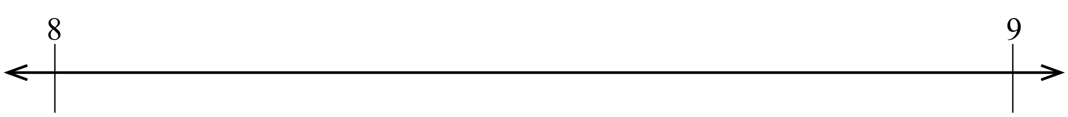
2. At the processing plant, the 50° F milk goes into a batch used for making ice cream. The average temperature for ice cream is 4° F. How long will it take the milk to reach 4° F if the temperature drops 2° F every minute?

Station Six: Marketing Manager

A marketing manager advertises, promotes and sells milk to distributors, processing plants, and, eventually, to the public.

1. How much does a gallon of milk weigh? ________

2. Plot the weight of a gallon of milk on the number line below.



3. Round the weight of a gallon of milk to the nearest whole number. ________

4. A dairy farmer has 800 lbs. of milk to sell. How many total gallons of milk is he/she trying to sell?

   Round to the nearest whole number. ________

Milk Makin' Math

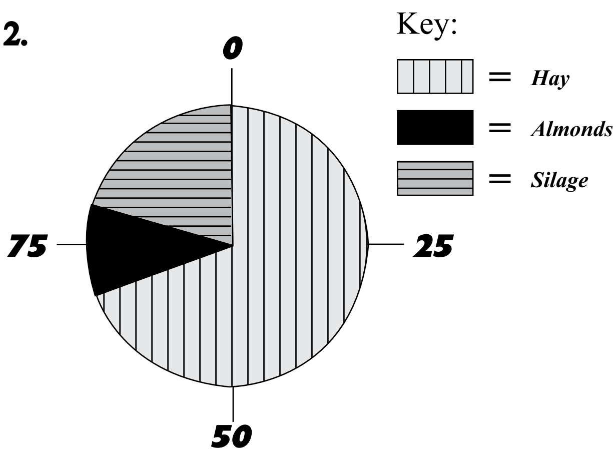
Answer Sheet

Station One: Dairy Nutritionist

1.

	Percent	Decimal	Fraction
Hay	*70%*	*.7*	*7/10*
Silage	*20%*	*.2*	*1/5*
Almond Hulls	*10%*	*.1*	*1/10*

2.



3\.

Hay *.70* x 60 = *42 lbs.*

Silage *.20* x 60 = *12 lbs.*

Almond Hulls *.10* x 60 = *6 lbs.*

Station Two: Dairy Farmer

1. ***60 min., 1 hr.***
2. ***100 min., 1.66 hrs.***
3. ***117.5 min., 1.96 hrs.***

Station Three: Veterinarian

1. Jersey 900 lbs. ***180cc's***
   Holstein 1,500 lbs. ***300cc's***
   Brown Swiss 1,400 lbs. ***280cc's***
   Guernsey 1,050 lbs. ***210cc's***
   Ayrshire 1,200 lbs. ***240cc's***
2. ***The amount of medicine is based on weight. Since dairy cows weigh more than humans, they would need more medicine.***

Station Four: Accountant

1. ***2,000 lbs. of Milk***
2. ***$360.00***
3. Total: ***$10,953.27***

Station Five: Safety Inspector

1. 12.75^{o}, $12\ {}^{3}/_{4}{}^{o}$
2. 23 minutes

Station Six: Marketing Manager

1. ***8.6 lbs.***
2. ***8.6 lbs.***
3. ***9 lbs.***
4. ***93 gallons***

Map of the World Showing Major Countries

Map By: [WaterproofPaper.com]

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