

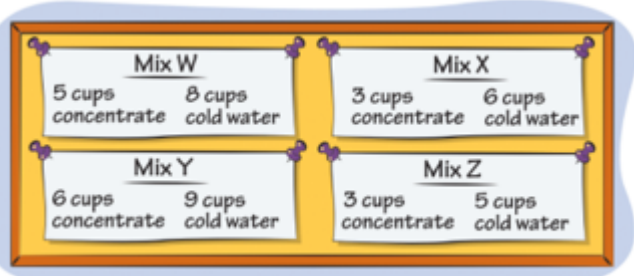
Comparing and Scaling

Applications-Connections-Extensions

With Answers & Problem Correlations

Investigation 1

	Applications	Connections	Extensions	Total
1.1	4	4	3	11
1.2	6	4	2	12
1.3	4	5	2	11
Total	14	13	7	34

Probl	Exercise and Answer	CMP4 Problem	Note
1	<p>Compare these four mixes for apple juice.</p>  <p>Which mix would make the most “appley” juice? Explain your reasoning.</p>	1.1	
2	<p>Examine these statements about the apple juice mixes in Exercise 1. Decide whether each is accurate. Give reasons for your answers.</p> <ul style="list-style-type: none"> Mix Y has the most water per batch, so it will taste the least “appley”. Mix Z is the most “appley” because the difference between the concentrate and water is 2 cups. It is 3 cups for each of the others. Mix Y is the most “appley” because it has only $1\frac{1}{2}$ cups of water for each cup of concentrate. The others have more water per cup. Mix X and Mix Y taste the same because you just add 3 cups of concentrate and 3 cups of water to turn Mix X into Mix Y. 	1.1	
3	<p>If possible, write each comparison of concentrate to water as a ratio. If not possible, explain why.</p> <p>a. The mix is 60% concentrate</p>	1.1	

	<p>b. The fraction of the mix that is water is $\frac{3}{5}$</p> <p>c. The difference between the amount of concentrate and water is 4 cups.</p>		
4	<p>The 7th grade students at Neilson Middle School are planning an end - of- year event. Of the 150 students in the school, 100 would like an athletic event and 50 would like a concert. Several students rewrote this information in the statements below.</p> <ol style="list-style-type: none"> Does each statement accurately report the results of the Neilson Middle School survey? Why? Which of these statements represent ratios? Explain why or why not. <div style="display: flex; flex-wrap: wrap; justify-content: space-around;"> <div style="width: 30%; background-color: #e6ffe6; padding: 5px; margin-bottom: 10px;"> <p>Uno's Statement</p> <p>At Neilson Middle School, $\frac{1}{3}$ of the students prefer a concert to an athletic event.</p> </div> <div style="width: 30%; background-color: #e6e6ff; padding: 5px; margin-bottom: 10px;"> <p>Dalawa's Statement</p> <p>For every 2 students who prefer an athletic even, 1 student prefers a concert.</p> </div> <div style="width: 30%; background-color: #ffe6ff; padding: 5px; margin-bottom: 10px;"> <p>San's Statement</p> <p>The unit rate of students who prefer a concert to students who prefer an athletic event is 1 to 2.</p> </div> <div style="width: 30%; background-color: #ffe6e6; padding: 5px; margin-bottom: 10px;"> <p>Apat's Statement</p> <p>Then number of students who prefer an athletic event is 50 more than the number who prefer a concert.</p> </div> <div style="width: 30%; background-color: #e6ffe6; padding: 5px; margin-bottom: 10px;"> <p>Tano's Statement</p> <p>The number of students who prefer an athletic event is two times the number who prefer a concert.</p> </div> <div style="width: 30%; background-color: #ffe6e6; padding: 5px;"> <p>Che's Statement</p> <p>At Neilson Middle School, 50% of the students prefer a concert to an athletic event.</p> </div> </div>	1.1	
5	<p>The 150 students at Neilson Middle School were surveyed about the time for school lunch. The principal reported the results with the following ratios:</p> <p style="padding-left: 40px;">3 out of 5 students wanted lunch earlier in the day 1 out of 3 students wanted lunch to remain the same 1 out of 5 students wanted lunch later in the day</p> <ol style="list-style-type: none"> Use the data to determine how many students responded to each time slot for lunch. Write a comparison statement about the survey. 	1.2	

	<p>A can of concentrated grapefruit juice includes the instructions:</p> <p>Mix one can of concentrate with 4 cans of cold water.</p> <p>For exercises #6 - 10 use those mixing instructions.</p>		
6	<p>Write a ratio for each situation. Then decide whether the situation is part-to-part or part-to-whole.</p> <p>a. Water to concentrate</p> <p>b. Concentrate to juice</p> <p>c. Water to juice</p>	1.2	
7	<p>Determine which of the situations described in Exercise 6 can be represented by the following ratios. Explain your reasoning.</p> <p>a. 12 to 60</p> <p>b. $\frac{3}{12}$</p> <p>c. 2 : 2 $\frac{1}{2}$</p> <p>d. $\frac{5}{10}$</p>	1.2	
8	<p>Jonathan and Samantha are making grapefruit juice from concentrate for a carnival. Jonathan mixes 10 cans of concentrate with 40 cans of water. Samantha mixes 8 cans of concentrate with 32 cans of water. Their teacher asks them to combine the two mixes into one large container. Is the new mixture less “grapefruity”, more “grapefruity” or the same as the original recipe? Explain your reasoning.</p>	1.2	
9	<p>Find the missing value in each situation. State the scale factor you used.</p> <p>a. 24 cans concentrate: ■ cans water</p> <p>b. 24 cans concentrate : ■ cans juice</p> <p>c. 24 cans juice : ■ cans water</p> <p>d. 24 cans juice : ■ cans concentrate</p>	1.2	

10	<p>Raina, Amelia, and Krista wanted to find the number of cans of concentrate they would need if they used 128 cans of water. They knew the problem they were trying to solve was $\frac{1}{4} = \frac{x}{128}$. Which of the following strategies would work? Explain.</p> <div style="border: 1px solid gray; padding: 10px; margin-bottom: 10px;"> <p style="text-align: center;">Raina's Strategy</p> <p>I was looking for $\frac{1}{4}$ of 128. I took 128 and divided it by 4 to find the value of x. $x = 32$</p> </div> <div style="border: 1px solid gray; padding: 10px; margin-bottom: 10px;"> <p style="text-align: center;">Amelia's Strategy</p> <p>I wrote a series of equivalent fractions by doubling the numerator and denominator.</p> $\frac{1}{4} = \frac{2}{8} = \frac{4}{16} = \frac{8}{32} = \frac{16}{64} = \frac{32}{128} \text{ so } x = 32$ </div> <div style="border: 1px solid gray; padding: 10px;"> <p style="text-align: center;">Krista's Strategy</p> <p>I factored the denominator of the right side of the equation to determine x.</p> $\frac{1}{4} = \frac{x}{128} = \frac{1 \cdot 1 \cdot 8}{4 \cdot 4 \cdot 8}$ </div>	1.2	
11	<p>Jared and Pedro walk 1 mile in 15 minutes. They can keep up this pace for several hours.</p> <ol style="list-style-type: none"> a. About how far can they walk in 90 minutes? b. About how far can they walk in 65 minutes? 	1.3	
12	<p>Swimming $\frac{1}{4}$ of a mile uses about the same number of calories as running 1 mile.</p> <ol style="list-style-type: none"> a. Gilda ran a 26 mile marathon. About how far would her sister have to swim to use the same number of calories Gilda used during the marathon? b. Juan swims 5 miles a day. About how many miles would he have to run to use the same number of calories used during his swim? 	1.3	
13	<p>After testing many samples, an electric company determined that approximately 2 of every 1,000 light bulbs on the market are defective. Americans buy more than 1 billion light bulbs every year. Estimate how many of these bulbs are defective.</p>	1.3	

14	<p>The organizers of an environmental conference order buttons for the participants. They pay \$18 for 12 dozen buttons. Write and solve proportions to answer each question below. (Assume that the price is proportional to the size of the order.)</p> <p>a. How much do 4 dozen buttons cost?</p> <p>b. How much do 50 dozen buttons cost?</p> <p>c. How many dozens of buttons can the organizers buy for \$27?</p> <p>d. How many dozens of buttons can the organizers buy for \$63?</p>	1.3	
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Connections

Problem #	Exercise and Answer	CMP4 Problem #	Note
15	<p>In a taste test of new ice creams invented at Moo University, 750 freshmen preferred Cranberry Bog ice cream, while 1,250 freshmen preferred Coconut Orange ice cream. Complete each statement below:</p> <p>a. The fraction of freshmen who preferred Cranberry Bog is _____.</p> <p>b. The percent of freshmen who preferred Coconut Orange is ■.</p> <p>c. The ratio of freshmen preferring Coconut Orange to those who preferred Cranberry Bog was ■ to ■.</p>	1.1	
16	<p>The Business Club at Neilson Middle School is studying surveys and other marketing strategies. One of the surveys is about people's preferences for two different kinds of cola. Club members have various opinions about ways to report the results from the cola taste test. Here are four statements about the cola taste-test results.</p> <div style="display: flex; justify-content: space-around;"> <div style="background-color: #c85130; color: white; padding: 5px; text-align: center;"> Daya's Statement </div> <div style="background-color: #2e5496; color: white; padding: 5px; text-align: center;"> Deux's Statement </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid black; padding: 5px;"> <p><i>In a taste test, people who preferred Bolda Cola outnumbered those who preferred Cola-Nola by a ratio of 17,139 to 11,426.</i></p> </div> <div style="border: 1px solid black; padding: 5px;"> <p><i>In a taste test, 5,713 more people preferred Bolda Cola.</i></p> </div> </div>	1.1	

	<p style="text-align: center; background-color: #00b050; color: white; padding: 5px;">Tres's Statement</p> <p style="padding: 5px;">In a taste test, 60% of the people preferred Bolda Cola.</p>	<p style="text-align: center; background-color: #6a3d9a; color: white; padding: 5px;">Shi's Statement</p> <p style="padding: 5px;">In a taste test, people who preferred Bolda Cola outnumbered those who preferred Cola-Nola by a ratio of 3 to 2.</p>		
	<ul style="list-style-type: none"> Which statement(s) do you think would be best in an advertisement for Bolda Cola? Why? Do the statements represent ratios? Explain why or why not. Suppose you surveyed 1,000 cola drinkers. What numbers of Bolda Cola and Cola-Nola drinkers would you expect? Explain your reasoning Is it possible that all four statements accurately represent the same survey data? Explain. 			
17	<p>In a comparison taste test of two juice drinks, 780 people preferred CranberryBlast. Only 220 people preferred Melon Splash. Complete each statement.</p> <ol style="list-style-type: none"> a. There were <input type="text"/> more people who preferred Cranberry Blast. b. In the taste test, _____% of the people preferred Cranberry Blast. c. People who preferred Cranberry Blast outnumbered those who preferred Melon Splash by a ratio of <input type="text"/> to <input type="text"/>. 		1.1	
18	<p>A town is debating whether to put in curbs along the streets. The ratio of town residents who support putting in curbs to those who oppose it is $\frac{2}{5}$.</p> <ol style="list-style-type: none"> a. What fraction of the residents oppose putting in curbs? b. If 210 people in the town are surveyed, how many do you expect to favor putting in curbs? c. What percent of the residents oppose putting in curbs? 		1.1	
19	<p>Orlando and Tanya are experimenting with different grapefruit mix ratios. Determine whether each mix below will result in a more concentrated (more "grapefruity") or a less concentrated (less "grapefruity") mix than the original mix instructions of "Mix one can of concentrate with 4 cans of cold water."</p>		1.2	

	<div style="display: flex; flex-wrap: wrap; justify-content: space-around;"> <div style="border: 1px solid gray; padding: 5px; width: 45%; text-align: center;"> <p>Mix A</p> <p>3 cans concentrate : 15 cans water</p> </div> <div style="border: 1px solid gray; padding: 5px; width: 45%; text-align: center;"> <p>Mix B</p> <p>3 cans concentrate : 15 cans juice</p> </div> <div style="border: 1px solid gray; padding: 5px; width: 45%; text-align: center;"> <p>Mix C</p> <p>10 cans cold water : 7 cans concentrate</p> </div> <div style="border: 1px solid gray; padding: 5px; width: 45%; text-align: center;"> <p>Mix D</p> <p>$\frac{1}{4}$ can concentrate : $1\frac{1}{2}$ cans water</p> </div> </div>		
	<p>The sketches below show two members of the Grump family. The Grumps are geometrically similar. Use the figures for Exercises # 20-22.</p> <div style="text-align: center;"> </div>		
20	<p>Write statements comparing the lengths of corresponding segments in the Grumps. Use each concept at least once.</p> <ol style="list-style-type: none"> Ratio Fraction Percent Scale Factor 	1.2	
21	<p>How long is the segment in the smaller Grump that corresponds to the 1.4 inch segment in the larger Grump?</p>	1.2	
22	<p>Multiple Choice The mouth of the smaller Grump is 0.6 inches wide. How wide is the mouth of the larger Grump?</p> <p>A. 0.4 in. B. 0.9 in. C. 1 in. D. 1.2 in.</p>	1.2	
23	<p>Find a value that makes each sentence correct. Explain your reasoning in each case.</p> <p>a. $\frac{3}{4} = \frac{\quad}{12}$</p>	1.3	

b. $\frac{3}{4} < \frac{\quad}{12}$

c. $\frac{3}{4} > \frac{\quad}{12}$

d. $\frac{9}{12} = \frac{12}{\quad}$

24

Multiple Choice Choose the value that makes this proportion $\frac{18}{32} = \frac{\quad}{16}$ correct.

1.3

- A. 7
- B. 8
- C. 9
- D. 10

25

Multiple Choice Choose the value that makes $\frac{\quad}{30} \leq \frac{6}{20}$ correct.

1.3

- A. 9
- B. 10
- C. 11
- D. 12

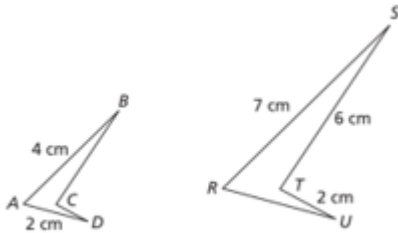
26

Students at Neilson Middle school were asked to record how they spend their time from midnight on Friday to midnight on Sunday. This is Carlos' record of how he spent his weekend.

1.3


Weekend Activities	
Activity	Number of Hours
Sleeping	18
Eating	2.5
Sports	8
Internet	2
Watching Television	6
Homework	2
Other	9.5

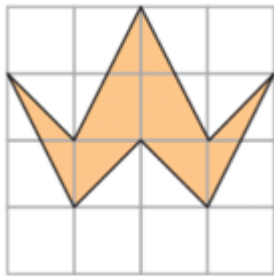
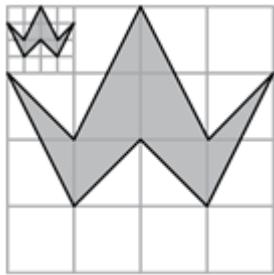
Decide whether each statement is an accurate description of how Carlos spent his time that weekend. Explain your reasoning.

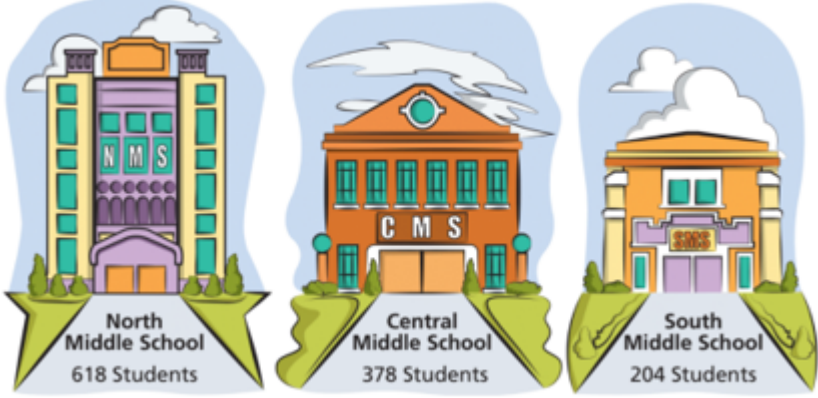
	<p>a. Carlos spent one-sixth of his time watching television.</p> <p>b. The ratio of hours spent watching television to hours spent doing chores or homework was 3 to 1.</p> <p>c. Sports, internet, and watching television took about 33% of his time.</p> <p>d. Time spent doing homework was only 20% of the time spent watching television.</p> <p>e. Sleeping, eating, and “other” activities took up 12 hours more than all other activities combined.</p>		
27	<p>The polygons below are similar</p>  <p>a. What is the length of side BC? Explain your reasoning.</p> <p>b. What is the length of side RU? Explain your reasoning.</p> <p>c. What is the length of side CD? Explain your reasoning.</p>	1.3	

Extensions

Problem #	Exercise and Answer	CMP4 Problem #	Note
28	<p>A fruit bar is 5 inches long. The bar will be split into two pieces. For each situation, find the lengths of the two pieces.</p> <p>a. One piece is $\frac{3}{10}$ of the whole bar</p> <p>b. One piece is 60% of the bar.</p>	1.1	

	c. One piece is 1 inch longer than the other.																																
29	Exercise # 28 includes several numbers or quantities: 5 inches, $\frac{3}{10}$, 60%, and 1 inch. Determine whether each number or quantity refers to the whole, a part, or the difference between two parts.	1.1																															
30	<p>Rewrite this ad so that it will be more effective.</p> 	1.1																															
31	<p>The United States uses the English system of measurement. The English system has many old conversions that are rarely used.</p> <p style="text-align: center;">English System Measurement Conversions</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>1 foot = 12 inches</td> <td>1 furlong = 220 yards</td> <td>1 rod = 5.5 yards</td> </tr> <tr> <td>1 yard = 3 feet</td> <td>1 furlong = 10 chains</td> <td>1 yard = 16 nails</td> </tr> <tr> <td>1 mile = 5,280 feet</td> <td>1 furlong = 1,000 links</td> <td>1 foot = 4 palms</td> </tr> <tr> <td>1 mile = 1,760 yards</td> <td>1 furlong = 40 rods</td> <td>1 foot = 3 hands</td> </tr> </table> <p>Use the measurement conversions to complete the table below.</p> <p style="text-align: center;">Time Predictions</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th style="background-color: #00a0e3; color: white;">Distance and Time</th> <th style="background-color: #00a0e3; color: white;">Prediction</th> </tr> </thead> <tbody> <tr> <td>a.</td> <td>1,584 feet in 3 minutes</td> <td>1 mile in <input type="checkbox"/></td> </tr> <tr> <td>b.</td> <td>2 furlongs in 10 minutes</td> <td>1 mile in <input type="checkbox"/></td> </tr> <tr> <td>c.</td> <td>1,500 links in 12 minutes</td> <td>1 mile in <input type="checkbox"/></td> </tr> <tr> <td>d.</td> <td>4 rods in 11 seconds</td> <td>1 mile in <input type="checkbox"/></td> </tr> <tr> <td>e.</td> <td>5 chains in 1 minute</td> <td>1 mile in <input type="checkbox"/></td> </tr> </tbody> </table>	1 foot = 12 inches	1 furlong = 220 yards	1 rod = 5.5 yards	1 yard = 3 feet	1 furlong = 10 chains	1 yard = 16 nails	1 mile = 5,280 feet	1 furlong = 1,000 links	1 foot = 4 palms	1 mile = 1,760 yards	1 furlong = 40 rods	1 foot = 3 hands		Distance and Time	Prediction	a.	1,584 feet in 3 minutes	1 mile in <input type="checkbox"/>	b.	2 furlongs in 10 minutes	1 mile in <input type="checkbox"/>	c.	1,500 links in 12 minutes	1 mile in <input type="checkbox"/>	d.	4 rods in 11 seconds	1 mile in <input type="checkbox"/>	e.	5 chains in 1 minute	1 mile in <input type="checkbox"/>	1.2	
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<p>32</p>	<p>The picture below is drawn on a centimeter grid.</p>  <p>a. On a grid made of larger squares than those shown here, draw a figure similar to this figure. What is the scale factor from the original figure to your drawing?</p> <p>b. Draw another similar figure but use a grid of smaller squares than those shown here. What is the scale factor from the original figure to your drawing?</p>  <p>c. Compare the perimeters and areas of the original figure and its copy in each case (enlargement and reduction). Explain how these values are related to the scale factor in each case.</p>	<p>1.2</p>	
<p>33</p>	<p>Middletown sponsors a two-day conference for selected middle school students to study government. There are three middle school is Middletown.</p> <p>Suppose 20 student delegates will attend the conference. Each school should be represented fairly in relation to its population.</p> <p>How many should be selected from each school?</p>	<p>1.3</p>	


			
34	<p>The people of the United States are represented in Congress, which is made up of the House of Representatives and the Senate.</p> <ol style="list-style-type: none"> In the House of Representatives, the number of representatives from each state varies. From what you know about Congress, how is the number of representatives from each state determined? How is the number of senators from each state determined? Compare the two methods of determining representation in Congress. What are the advantages and disadvantages of these two forms of representations for states with large populations? How about for state with small populations? 	1.3	

Investigation 2

	Applications	Connections	Extensions	Total
2.1	3	3	2	8
2.2	2	4	1	7
2.3	4	4	1	9
Total	9	11	4	24

Applications

Problem #	Exercise and Answer	CMP4 Problem # Correlation	Note										
1	<p>Guests at a pizza party are seated at three tables. The small table has 5 seats and 2 pizzas. The medium table has 7 seats and 3 pizzas. The large table has 12 seats and 5 pizzas. The pizzas at each table are shared equally. At which table does a guest get the most pizza?</p>	2.1											
2	<p>Suppose a news story about the Super Bowl claims, "Men outnumbered women in the stadium by a ratio of 9 to 5." Haru thinks that this means there were 14 people in the stadium- 9 men and 5 women. Do you agree with Haru? Why or Why not?</p>	2.1											
3	<p>Multiple Choice Which of the following is a correct interpretation of the statement "Men outnumbered women by a ratio of 9 to 5"?</p> <p>A. There were four more men than women. B. The number of men was 1.8 times the number of women. C. The number of men divided by the number of women was equal to the quotient of 5 ÷ 9. D. In the stadium, five out of nine fans were women.</p>	2.1											
4	<p>Franky's Trail Mix Factory gives customers the information in the table below. Use the pattern in the table to answer the questions.</p> <p style="text-align: center;">Caloric Content of Franky's Trail Mix</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="background-color: #0070C0; color: white;">Grams of Trail Mix</th> <th style="background-color: #0070C0; color: white;">Calories</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">50</td> <td style="text-align: center;">150</td> </tr> <tr> <td style="text-align: center;">150</td> <td style="text-align: center;">450</td> </tr> <tr> <td style="text-align: center;">300</td> <td style="text-align: center;">900</td> </tr> <tr> <td style="text-align: center;">500</td> <td style="text-align: center;">1,500</td> </tr> </tbody> </table> <p>a. Fiona eats 75 grams of trail mix. How many calories does she eat?</p> <p>b. Rico eats trail mix containing 1,00 calories. How many grams of trail mix does he eat?</p> <p>c. Write an equation to represent the number of calories in any number of grams of trail mix.</p> <p>d. Write an equation to represent the number of grams of trail mix that will provide any given number of calories.</p>	Grams of Trail Mix	Calories	50	150	150	450	300	900	500	1,500	2.2	
Grams of Trail Mix	Calories												
50	150												
150	450												
300	900												
500	1,500												
5	<p>Carter wants to join a gym. He is looking at two gyms in his neighborhood.</p> <p>CardioPlus charges \$55 per month</p>	2.2											

	<p>Run and Fun charges a \$30 sign-up fee and then \$50 per month</p> <p>Which gym do you think Carter should join? Explain your reasoning.</p>		
6	<p>Mia found oranges on sale at another store instead of the Foodfresh store in Problem 2.3. She wrote the equation $C = 0.30N$.</p> <ol style="list-style-type: none"> Does the new store have a cheaper price for oranges? How would the graphs and tables compare to the graphs and tables for Foodfresh? Explain your reasoning. 	2.3	
7	<p>The dairy uses 50 pounds of milk to make 5 pounds of cheddar cheese.</p>  <p>The image shows a visual equation: five white milk jugs with red caps are arranged in a row, separated by plus signs. This is followed by an equals sign and a block of yellow cheddar cheese, which is partially cut into smaller pieces.</p> <ol style="list-style-type: none"> Make a rate table showing the amount of milk needed to make 5, 10, 15, 20, ..., and 50 pounds of cheddar cheese. Graph the relationship between pounds of milk and pounds of cheddar cheese. First, decide which variable should go on each axis. Write an equation relating pounds of milk m to pounds of cheddar cheese c. What is the constant of proportionality in your equation from part (c)? Explain one advantage of each method (the graph, the table, and the equation) to express the relationship between milk and cheddar cheese production. 	2.3	
8	<p>a. Several students wonder which is a better buy, a 40-pack of pencil-top erasers for \$2.82 or a 2-pack of pencil-top erasers for \$0.12. They use</p>	2.3	

different methods to arrive at an answer. Which of these methods are correct? Which method do you prefer? Explain.

Courtney

Compare the two unit rates to determine which unit rate is cheaper.

$$\frac{2.82}{40} = \frac{x}{1} \quad x = 0.0705 = \$0.07 \text{ per eraser}$$

$$\frac{0.12}{2} = \frac{x}{1} \quad x = 0.06 = \$0.06 \text{ per eraser}$$

The 2-packs have a cheaper per-eraser price.

Elliot

If I buy 40 of the 2-packs of erasers, the total cost will be $40 \times 0.12 = 4.8 = \$4.80$

That is more expensive than spending \$2.82 for a 40-pack of erasers. The 40-pack is the better deal.

Julio

If a 2-pack costs \$.12, then twenty 2-packs would have the same number of erasers as the 40-pack. Twenty 2-packs cost $20 \times 0.12 = 2.4 = \$2.40$

Since a 40-pack costs \$2.82, the price per eraser of the 2-packs is cheaper.

Kimi

If a 40-pack costs \$2.82, then half of the pack (20 erasers) should cost \$1.41.

Ten 2-packs (also 20 erasers) should cost \$1.20. This is cheaper. The price per eraser is cheaper using the 2-packs.

b. Describe another method you can use to determine which is the better buy.

9

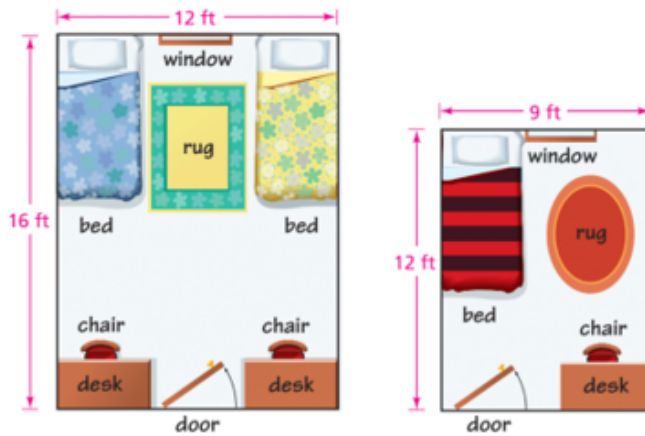
For each situation, find a unit rate and write an equation relating the two quantities.

- a. 3 dozen apples for \$4.50
- b. 30 bottles of water for \$4.80
- c. 24 ounces of mozzarella cheese for \$2.88

2.3

Connections

Problem #	Answer	CMP4 Problem #	Note
10	<p>Multiple Choice Choose the value that makes this proportion correct:</p> $\frac{18}{30} = \frac{\quad}{15}$ <p>A. 7 B. 8 C. 9 D. 10</p>	2.1	
11	<p>If possible, change each comparison of red paint to white paint to a percent comparison. If not possible, explain why.</p> <p>a. The fraction of a mix that is red paint is $\frac{1}{4}$.</p> <p>b. The ratio of red to white paint in a different mix is 2 to 5.</p>	2.1	
12	<p>If possible, change each comparison to a fraction comparison. If it is not possible, explain why.</p> <p>a. A nut mix is 30% peanuts.</p> <p>b. The ratio of almonds to other nuts in a mix is 1 to 7.</p>	2.1	
	<p>For Exercises 13-16, rewrite each equation. Replace the variable with a number that makes a true statement.</p>		
13	$\frac{4}{9} \times n = 1\frac{1}{3}$	2.2	
14	$n \times 2.25 = 90$	2.2	
15	$n \div 15 = 120$	2.2	
16	$180 \div n = 15$	2.2	
17	<p>These diagrams show floor plans for two different dorm rooms. One room is for two students. The other is for one student.</p>	2.3	



- Are the floor plan designs similar rectangles? If so, what is the scale factor? If not, why not?
- What is the ratio of the floor areas of the two rooms (including the space under the beds and desks)?
- Which room gives more space per student?

18

Solve each proportion.

a. $\frac{x}{15} = \frac{20}{30}$

b. $\frac{18}{x} = \frac{4.5}{1}$

c. $\frac{0.1}{48} = \frac{x}{960}$

d. $\frac{10}{900} = \frac{3.5}{x}$

2.3

For Exercises 19 and 20, use both the table and the graph below.

The table shows the mean times that students in one seventh-grade class spend on several activities during a weekend. The data are also displayed in the stacked bar graph.

	<p style="text-align: center;">Weekend Activities (hours)</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Boys</th> <th>Girls</th> <th>All Students</th> </tr> </thead> <tbody> <tr> <td>Sleeping</td> <td>18.8</td> <td>18.2</td> <td>18.4</td> </tr> <tr> <td>Eating</td> <td>4.0</td> <td>2.7</td> <td>3.1</td> </tr> <tr> <td>Sports</td> <td>7.8</td> <td>6.9</td> <td>7.2</td> </tr> <tr> <td>Texting</td> <td>0.5</td> <td>0.7</td> <td>0.6</td> </tr> <tr> <td>Watching TV</td> <td>4.2</td> <td>3.0</td> <td>3.4</td> </tr> <tr> <td>Chores and Homework</td> <td>3.6</td> <td>5.8</td> <td>5.1</td> </tr> <tr> <td>Other</td> <td>9.1</td> <td>10.7</td> <td>10.2</td> </tr> </tbody> </table> <p style="text-align: center;">Weekend Activities</p>	Category	Boys	Girls	All Students	Sleeping	18.8	18.2	18.4	Eating	4.0	2.7	3.1	Sports	7.8	6.9	7.2	Texting	0.5	0.7	0.6	Watching TV	4.2	3.0	3.4	Chores and Homework	3.6	5.8	5.1	Other	9.1	10.7	10.2		
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19	The stacked bar graph was made using the data from the table. Explain how it was constructed.	2.3																																	
20	Suppose you are writing a report summarizing the class's data. You have space for either the table or the graph, but not both. What is one advantage of including the table? What is one advantage of including the bar graph?	2.3																																	

Extensions

Problem #	Answer	CMP4 Problem #	Note
21	Chemistry students analyzed the contents of rust. They found that it is made up of iron and oxygen. Tests on samples of rust gave the data in the table below.	2.1	

Contents of Rust

Amount of Rust (g)	Amount of Iron (g)	Amount of Oxygen (g)
50	35.0	15.0
100	70.0	30.0
135	94.5	40.5
150	105.0	45.0

- a) Is the ratio of iron to oxygen the same in each sample? Explain.
- b) Is the ratio of iron to total rust the same in each sample? Explain.
- c) The students analyze 400 grams of rust. How much iron and how much oxygen should they find?

22

Use the table below.

Money Spent on Food

Where Food Is Eaten	2002	2010
Home	\$471,533,000,000	\$617,475,000,000
Away from Home	\$295,341,000,000	\$446,442,000,000

Source: U.S. Census Bureau

- a. Compare money spent on food eaten at home and food eaten away from home to the total amount spent on food each year. Write statements for each year.
- b. Explain how the statements you wrote in part (a) show the money spent on food away from home increasing or decreasing in relation to the total spent on food.

2.1

23

Mammals vary in the length of their pregnancies, or gestations. Gestation is the time from conception to birth. Use the table to answer the questions below.

Gestation Times and Life Spans of Selected Mammals

Animal	Gestation (days)	Life Span (years)
Chipmunk	31	6
Cat	63	12
Fox	52	7
Lion	100	15
Black Bear	219	18
Gorilla	258	20
Moose	240	12
Giraffe	425	10
Elephant (African)	660	35

Source: The World Almanac and Book of Facts

2.2

	<p>a. For each mammal listed in the table, compare life span to gestation.</p> <p>b. Which animal has the greatest ratio of life span to gestation time? Which has the least ratio?</p> <p>c. Plot the data on a coordinate graph using (gestation, life span) as data points. Describe any patterns that you see. Is there a relationship between the two variables? Explain.</p> <p>d. What pattern would you expect to see in a graph if each statement were true?</p> <p>i. Longer gestation time implies longer life span.</p> <p>ii. Longer gestation time implies shorter life span.</p>																		
24	<p>A cranberry bog owner has pressed 240 liters of cranberry juice. He has many sizes of container in which to package the juice.</p> <p>a. The owner wants to package all the cranberry juice in identical containers. Copy and complete the table to show the number of containers of each size the owner would need to package the juice.</p> <p style="text-align: center;">Containers Needed by Volume</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="background-color: #00a0e3; color: white;">Volume of Container (liters)</td> <td>10</td> <td>4</td> <td>2</td> <td>1</td> <td>$\frac{1}{2}$</td> <td>$\frac{1}{4}$</td> <td>$\frac{1}{10}$</td> </tr> <tr> <td style="background-color: #00a0e3; color: white;">Number of Containers Needed</td> <td>■</td> <td>■</td> <td>■</td> <td>■</td> <td>■</td> <td>■</td> <td>■</td> </tr> </table> <p>b. Write an equation that relates the volume V of a container and the number of containers n needed to hold 260 liters of cranberry juice</p>	Volume of Container (liters)	10	4	2	1	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{10}$	Number of Containers Needed	■	■	■	■	■	■	■	2.3	
Volume of Container (liters)	10	4	2	1	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{10}$												
Number of Containers Needed	■	■	■	■	■	■	■												


Investigation 3

	Applications	Connections	Extensions	Total
3.1	5	3	1	9
3.2	3	2	2	7
3.3	3	3	2	8

3.4	4	4	2	10
Total	15	12	7	34

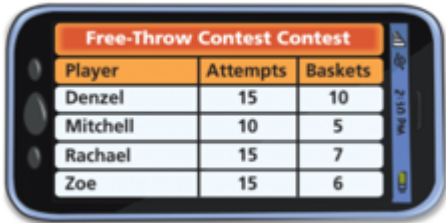
Applications

Problem #	<i>Exercise and Answer</i>	CMP4 Problem # Correlation	M			
1	Find the sales tax <ul style="list-style-type: none"> a. A sweater for \$36.00 at 7% sales tax. b. A skateboard for \$62.80 at 6% sales tax. c. A baseball hat for \$22.90 at 5% sales tax. d. A digital camera for \$249.99 at 4% sales tax. e. A board game for \$29.95 at 8% sales tax. 	3.1				
2	Bennet tried to solve #1 a few different ways. Which of his methods are correct? Of the correct methods, which makes the most sense to you? Explain. <ul style="list-style-type: none"> A. 5% sales tax means that for every dollar you spend, you need to pay a nickel in tax. If you buy something for \$21, you need to pay 21 nickels in tax. B. You can set up a proportion and solve for the missing value: $\frac{.05}{\\$1.00} = \frac{x}{\\$21.00}$ C. I know that 10% of \$21.00 is \$2.10, so 5% would be half of \$2.10. D. 5% is equal to $\frac{1}{20}$. To find the amount of tax on \$21.00, find $\\$21 \div 20$. E. 1% of \$21.00 is \$.21, so 5% of \$21.00 is 5 x \$.21. 	3.1				
	For Exercises 3-5 identify which estimate seems the most reasonable. Explain your choice.					
3	5% tax on a \$42.00 purchase <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">Under \$2.00</td> <td style="text-align: center;">Exactly \$2.00</td> <td style="text-align: center;">Over \$2.00</td> </tr> </table>	Under \$2.00	Exactly \$2.00	Over \$2.00	3.1	
Under \$2.00	Exactly \$2.00	Over \$2.00				
4	9% tax on a \$59.99 purchase <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">Under \$6.00</td> <td style="text-align: center;">Exactly \$6.00</td> <td style="text-align: center;">Over \$6.00</td> </tr> </table>	Under \$6.00	Exactly \$6.00	Over \$6.00	3.1	
Under \$6.00	Exactly \$6.00	Over \$6.00				

5	5.5% tax on a \$309.95 purchase Under \$15.00 Exactly \$15.00 Over \$15.00	3.1																		
6	Jeffrey ate dinner at his favorite restaurant. The cost of the meal was \$22.75 before tax and tip. What would the total cost be if the tax was 5% and then he left a 15% tip on top of that?	3.2																		
7	<p>Frida went to Joseph’s Neighborhood Restaurant. She ordered tableside guacamole, fajitas, a side of sour cream, and a beverage. What is the total bill if the tax is 6% and she leaves a 15% tip on top of that?</p>  <table border="1"> <thead> <tr> <th colspan="2">Joseph's Neighborhood Restaurant Menu</th> </tr> </thead> <tbody> <tr> <td>Tableside guacamole</td> <td>\$11</td> </tr> <tr> <td>Queso Dip and Chips</td> <td>\$7.25</td> </tr> <tr> <td>Taco Platter</td> <td>\$13.25</td> </tr> <tr> <td>Fajitas</td> <td>\$17.50</td> </tr> <tr> <td>Burrito Plate</td> <td>\$12.50</td> </tr> <tr> <td>Sour Cream</td> <td>\$1.00</td> </tr> <tr> <td>Refried beans</td> <td>\$2.00</td> </tr> <tr> <td>Beverages</td> <td>\$1.00</td> </tr> </tbody> </table>	Joseph's Neighborhood Restaurant Menu		Tableside guacamole	\$11	Queso Dip and Chips	\$7.25	Taco Platter	\$13.25	Fajitas	\$17.50	Burrito Plate	\$12.50	Sour Cream	\$1.00	Refried beans	\$2.00	Beverages	\$1.00	3.2
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8	<p>A group of friends order pizza at a restaurant. Each person gives some money to Lennon before they order.</p> <p>a. Lennon has \$63 to spend on the order, including tax. The tax at the restaurant is 5%. What is the maximum cost of food the group can order and not go over \$63? Explain your reasoning.</p> <p>b. Lennon wants to leave a 15% tip on the price of the food, calculated before sales tax. What is the maximum cost of food the group can order and not go over \$63? Explain.</p>	3.2																		

9	<p>a. Alicia, Brandon, and Charlene wanted to solve the proportion $\frac{x}{4.24} = \frac{6.82}{2.2}$. Which of the students used a correct method?</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="border: 1px solid gray; padding: 10px; width: 45%; background-color: #e0e0e0;"> <p>Alicia</p> <p>First, I simplified the fraction on the right.</p> $\frac{x}{4.24} = 3.1$ <p>Then, I multiplied 3.1 by 4.24 to find x.</p> </div> <div style="border: 1px solid gray; padding: 10px; width: 45%; background-color: #e0e0e0;"> <p>Charlene</p> <p>I figured out that $6.82 - 2.2 = 4.62$. So, the numerator in the right fraction was 4.62 greater than the denominator. This means that $x = 4.24 + 4.62$, or 8.86.</p> </div> </div> <div style="border: 1px solid gray; padding: 10px; width: 60%; margin: 10px auto; background-color: #e0e0e0;"> <p>Brandon</p> <p>I multiplied all the values by 100 to eliminate the decimals.</p> $\frac{100x}{424} = \frac{682}{220}$ <p>Then I multiplied both sides by 424.</p> $100x = \frac{682 \cdot 424}{220}$ <p>I simplified the fraction on the right.</p> $100x = 1,314.4$ <p>Then I divided both sides by 100.</p> $x = \frac{1,314.4}{100}$ </div>	3.3
10	<p>Find the unit rate for the chimp food mix. Consider the unit rate to be the number of scoops of high fiber food per 1 scoop of high-protein food.</p> <p>a. 75% high-fiber chimp food to 25% high-protein chimp food b. 80% high-fiber chimp food to 20% high-protein chimp food c. 85% high-fiber chimp food to 15% high-protein chimp food d. 95% high-fiber chimp food to 5% high-protein chimp food</p>	3.3
11	<p>Find the percentage of the chimp food mix that is high fiber and the percentage of the mix that is high protein.</p> <p>Note: the unit rate is the number of scoops of high-fiber food per 1 scoop of high protein food.</p> <p>a. Unit rate is 1 b. Unit rate is $\frac{1}{3}$ c. Unit rate is 9</p>	3.3

12	<p>A group of students recorded the following data when they conducted the Leaky Faucet Experiment:</p> <table border="1"> <thead> <tr> <th>Number of Seconds</th> <th>Amount of Water (ml)</th> </tr> </thead> <tbody> <tr><td>0</td><td>8</td></tr> <tr><td>5</td><td>17</td></tr> <tr><td>10</td><td>25</td></tr> <tr><td>15</td><td>33</td></tr> <tr><td>20</td><td>41</td></tr> <tr><td>25</td><td>48</td></tr> <tr><td>30</td><td>56</td></tr> <tr><td>35</td><td>64</td></tr> <tr><td>40</td><td>72</td></tr> <tr><td>45</td><td>80</td></tr> <tr><td>50</td><td>89</td></tr> <tr><td>55</td><td>97</td></tr> <tr><td>60</td><td>105</td></tr> </tbody> </table> <p> a. What is the rate of water dripping in ml per minute? b. At this rate how much water is lost in a day? A Year? </p>	Number of Seconds	Amount of Water (ml)	0	8	5	17	10	25	15	33	20	41	25	48	30	56	35	64	40	72	45	80	50	89	55	97	60	105	3.4
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45	80																													
50	89																													
55	97																													
60	105																													
13	<p>Rachael's watch can check her pulse rate. It told her that her pulse rate was 17 beats in 15 seconds. What is her pulse rate in one minute?</p>	3.4																												
14	<p>At camp, Miriam uses a pottery wheel to make 3 bowls in 2 hours. Duane makes 5 bowls in 3 hours.</p> <p> a. Who makes bowls faster, Miriam or Duane? b. How long will it take Miriam to make a set of 12 bowls? c. How long will it take Duane to make a set of 12 bowls? </p>	3.4																												

15	<p>Denzel makes 10 of his first 15 shots in a basketball free-throw contest. His success rate stays about the same for his next 100 free throws. Write and solve a proportion for each part. Round your answer to the nearest whole number.</p> <div style="text-align: center;">  <table border="1" style="margin: auto;"> <thead> <tr> <th colspan="3">Free-Throw Contest</th> </tr> <tr> <th>Player</th> <th>Attempts</th> <th>Baskets</th> </tr> </thead> <tbody> <tr> <td>Denzel</td> <td>15</td> <td>10</td> </tr> <tr> <td>Mitchell</td> <td>10</td> <td>5</td> </tr> <tr> <td>Rachael</td> <td>15</td> <td>7</td> </tr> <tr> <td>Zoe</td> <td>15</td> <td>6</td> </tr> </tbody> </table> </div> <p>a. About how many baskets do you expect Denzel to make in his next 60 attempts?</p> <p>b. About how many free throws do you expect him to make in his next 80 attempts?</p> <p>c. About how many attempts do you expect Denzel to take to make 30 free throws?</p> <p>d. About how many attempts do you expect him to take to make 45 free throws?</p>	Free-Throw Contest			Player	Attempts	Baskets	Denzel	15	10	Mitchell	10	5	Rachael	15	7	Zoe	15	6	3.4
Free-Throw Contest																				
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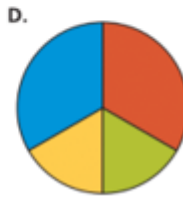
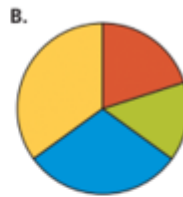
Connections

Problem #	Answer	CMP4 Problem #	Note
16	<p>Erin is buying a shirt that costs \$21 and has a 5% sales tax. She calculates the tax as $0.05 \times 21 = 1.05$, or \$1.05</p> <p>Erin notices that she can add $21 + 1.05 = 22.05$ to find the total cost, \$22.05. She used the Distributive Property to write $(1 \times 21) + (0.05 \times 21) = 1.05 \times 21$.</p> <p>For each item below, write the total cost of the item as the product of two numbers.</p>	3.1	

	Item Name	Price	Tax Rate	Tax
a.	shirt	\$21.00	5%	1.05×21
b.	bicycle	\$45.90	7%	
c.	shoes	\$67.50	6%	
d.	laptop	\$299.99	8%	
e.	video game	\$39.95	4%	

Credit	Debit	Subtotal	\$474.34
Check	Cash	Tax	
Print Receipt		Order total	
		Cash	

17	<p>In Exercise # 16 you used the Distributive Property to find the total cost of a product and sales tax. You can also use the Distributive Property to find the total cost after a discount.</p> <p>Suppose there is a 5% discount on a shirt that was originally priced at \$21. Write an expression that shows the discounted price of the shirt as the product of two numbers. Explain your reasoning.</p>	3.1	
18	<p>Bill's bike shop has a sale where the bike shop pays the customer's sales tax. By law, Bill has to charge a 6% sales tax, so he finds a different way to take the tax off the bill. Bill decides to give each customer a 6% discount.</p> <p>a. The customer pays the discounted price plus tax. Will this amount be the same as the original price? Explain your reasoning.</p> <p>b. Does it matter which is applied first, the discount or the tax? Explain.</p>	3.1	
19	<p>Multiple Choice Ayanna is making a circular spinner to be used at the school carnival. She wants the spinner to be divided so that 30% of the area is blue, 20% is red, 15% is green, and 35% is yellow. Choose the spinner that fits the description.</p>	3.2	



20

Hannah is making her own circular spinner. She makes the ratio of green to yellow 2 : 1, the ratio of red to yellow 3 : 1, and the ratio of blue to green 2 : 1. Make a sketch of her spinner.

3.2

Exercises # 21-23 are about ways to mix food for different primates at the zoo.

21

Mackenzie mixes the primate food. For the orangutans, she uses the information in the table below.

3.3

Orangutan Food Mix

Scoops of High-Protein Food	21	24	27	18	33
Scoops of High-Fiber Food	7	8	9	6	11

- What is the ratio of high-protein food to high-fiber food?
- Write an equation that relates the number of scoops of high-protein food to the number of scoops of high-fiber food.
- If Mackenzie mixes 12 scoops of high-protein food, how many scoops of high-fiber food should she add?
- For every 1 scoop of high-protein food, how many scoops of high-fiber does Mackenzie need?
- Draw a graph with the amounts of high-protein food on the y-axis and the amounts of high-fiber food on the x-axis.

22

The ratio of high-fiber food to high-protein food for baby gorillas is 30% to 70%.

- a. What is the unit rate for this mixture?
- b. Copy and complete the table below.

Baby Gorilla Food Mix

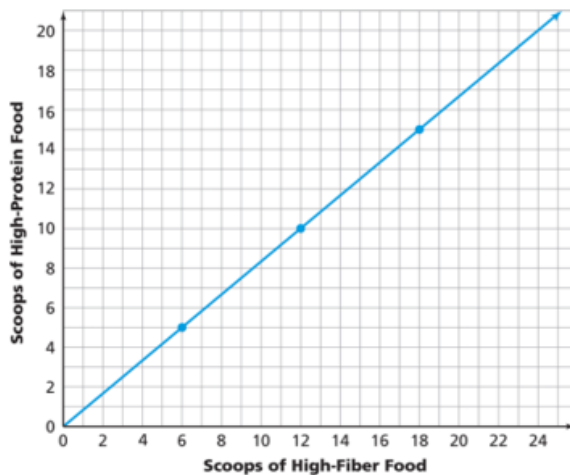
Scoops of High-Protein Food	■	14	1	■	x
Scoops of High-Fiber Food	3	■	■	1	■

- c. Graph the relationship of the high-protein food to high-fiber food for baby gorillas.
- d. Write an equation relating the number of scoops of high-protein food to the number of scoops of high-fiber food.

3.3

23

Mackenzie was given the following graph of the mix ratio for adult baboon food at the zoo.



- a. What is a good estimate for the number of scoops of high-protein food Mackenzie should use with 5 scoops of high-fiber food?

3.3

	<p>b. Mackenzie wants to remember a ratio of high-protein food to high-fiber food that uses small whole numbers. What ratio should she remember?</p> <p>c. Write an equation that represents the graph above</p> <p>d. Mackenzie uses 45 scoops of high protein food in a mix. How many scoops of high-fiber food should she use?</p>		
24	<p>a. Paula hears the water dripping in a faucet. She counts one drip every 5 seconds. How many drips are there in an hour?</p> <p>b. If there are 120 drips of water in 1 ounce, how many ounces of water is dripping out of the faucet in an hour?</p> <p>c. How many drips in a gallon?</p> <p>d. How long does it take for a gallon of water to drip out of the sink?</p> <p>e. How much water drips out in one week (7 days)?</p>	3.4	
25	<p>Which of these items is the better buy?</p> <p>a. An 8-pack of glue sticks for \$3.99 or 1 glue stick for \$.54</p> <p>b. A 12-pack of tape for \$2.50 or 1 roll of tape for \$.19</p> <p>c. A 100-pack of pencils for \$4.88 or 1 pencil for \$.05</p> <p>d. A 50-pack of paper clips for \$.89 or a 25-pack of paper clips for \$.45</p>	3.4	
26	<p>Half an avocado has about 160 calories. How many calories do a dozen avocados have?</p>	3.4	
27	<p>There are about 1.5 grams of fat in 1 tablespoon of hummus. How many grams of fat are in $2\frac{1}{2}$ cups of hummus? (Note: 16 tablespoons = 1 cup)</p>	3.4	

Extensions

Problem #	Answer	CMP4 Problem #	Note																									
28	<p>The city of Spartanville runs two summer camps, the Green Center Camp and the Blue Center Camp. The table shows recent attendance at the two camps.</p> <table border="1"> <thead> <tr> <th></th> <th>Green</th> <th>Blue</th> </tr> </thead> <tbody> <tr> <th>Boys</th> <td>125</td> <td>70</td> </tr> <tr> <th>Girls</th> <td>75</td> <td>30</td> </tr> </tbody> </table> <p>a. Use differences to compare the two centers' camp programs for boys and girls. Which center seems to offer a program that appeals more to girls?</p> <p>b. Use fractions to compare the two centers camp programs for boys and girls. Which center seems to offer a program that appeals more to girls?</p> <p>c. Use percents to compare the two centers' camp programs for boys and girls. Which center seems to offer a program that appeals more to girls?</p> <p>d. Use ratios to compare the appeal of the two centers' camp programs for boys and girls. Which center seems to offer a program that appeals more to girls?</p>		Green	Blue	Boys	125	70	Girls	75	30	3.1																	
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	<p>For Exercises #29-32 use the following information.</p> <p>Bill's Bikes sells used bikes. Bill buys used bikes, fixes them, and marks up the prices by 80%. The salesperson selling the bikes gets a 25% commission on the markup.</p>																											
29	<p>Roberto is a salesperson at Bill's Bikes. Find the missing values in the table for Roberto's sales.</p> <p style="text-align: center;">Costs and Revenue for Roberto's Sales</p> <table border="1"> <thead> <tr> <th>Buying Price</th> <th>Markup (80% of buying price)</th> <th>Selling Price</th> <th>Commission (25% of markup)</th> <th>Profit (money the shop makes on the sale)</th> </tr> </thead> <tbody> <tr> <td>\$100</td> <td>\$80</td> <td>\$180</td> <td>\$20</td> <td>\$60</td> </tr> <tr> <td>\$10</td> <td>■</td> <td>■</td> <td>■</td> <td>■</td> </tr> <tr> <td>\$55</td> <td>■</td> <td>■</td> <td>■</td> <td>■</td> </tr> <tr> <td>\$125</td> <td>■</td> <td>■</td> <td>■</td> <td>■</td> </tr> </tbody> </table>	Buying Price	Markup (80% of buying price)	Selling Price	Commission (25% of markup)	Profit (money the shop makes on the sale)	\$100	\$80	\$180	\$20	\$60	\$10	■	■	■	■	\$55	■	■	■	■	\$125	■	■	■	■	3.2	
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30	<p>Linda is a salesperson at Bill's Bikes. Find the missing values in the table for Linda's sales.</p> <p style="text-align: center;">Costs and Revenue for Linda's Sales</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Buying Price</th> <th>Markup (80% of buying price)</th> <th>Selling Price</th> <th>Commission (25% of markup)</th> <th>Profit (money the shop makes on the sale)</th> </tr> </thead> <tbody> <tr> <td>■</td> <td>\$48</td> <td>■</td> <td>■</td> <td>■</td> </tr> <tr> <td>■</td> <td>■</td> <td>\$252</td> <td>■</td> <td>■</td> </tr> <tr> <td>■</td> <td>■</td> <td>■</td> <td>\$14.40</td> <td>■</td> </tr> <tr> <td>■</td> <td>■</td> <td>■</td> <td>■</td> <td>\$54</td> </tr> <tr> <td>\$N</td> <td>■</td> <td>■</td> <td>■</td> <td>■</td> </tr> </tbody> </table>	Buying Price	Markup (80% of buying price)	Selling Price	Commission (25% of markup)	Profit (money the shop makes on the sale)	■	\$48	■	■	■	■	■	\$252	■	■	■	■	■	\$14.40	■	■	■	■	■	\$54	\$N	■	■	■	■	3.2	
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31	<p>For each arrow in the figure below, write a mathematical rule describing how to get from one value to the next value. The first one is done for you.</p> <div style="text-align: center;"> <pre> graph TD BP[Buying Price] -- "x 0.80" --> M[Markup] M --> C[Commission] M --> SP[Selling Price] C --> P[Profit] SP --> P </pre> </div>	3.3																															
32	<p>For each part in the diagram in # 33 , write two equations for the listed relationship.</p> <ol style="list-style-type: none"> The markup amount and the buying price The buying price and the selling price The commission and the markup amount The profit and the commission 	3.3																															
33	<p>Use the table to answer the questions about participation in team sports.</p>	3.4																															

**Participation in Team Sports
at Springbrook Middle School**

Sport	Girls	Boys
Basketball	30	80
Football	10	60
Soccer	120	85
Total surveyed	160	225

- a. In which sport do boys most outnumber girls?
- b. In which sport do girls most outnumber boys?
- c. The participation in these team sports is about the same for students at Key Middle School.
 - i. Suppose 250 boys at Key Middle School play sports. How many boys would you expect to play each of the three sports?
 - ii. Suppose 240 girls at Key Middle School play sports. How many girls would you expect to play each of the three sports?

34

Rita wants to estimate the number of beans in a large jar. She takes out 100 beans and marks them. Then she returns them to the jar and mixes them with the unmarked beans. She then gathers some data by taking a sample of beans from the jar. Use her data to predict the number of beans in the jar.

Sample

Number of marked beans: 2

Beans in sample: 30

3.4