Mini-Lecture 7.1
Percents, Decimals, and Fractions

Learning Objectives:
1. Understanding percent.
2. Write percents as decimals or fractions.
3. Write decimals or fractions as percents.
4. Applications with percents, decimals, and fractions.
5. Key Vocabulary: *percent.*

Examples:
1. Write the percent described by the sentence.
   In a recent survey of 100 students, 37 of the students indicated that they eat lunch at the dining hall. What percent of the students surveyed do not eat lunch in the dining hall?

2. Write each percent as a decimal.
   a) 32%   b) 5.7%   c) 120%   d) 0.02%

   Write each percent as a fraction or mixed number in simplest form.

   e) 15%   f) 8.1%   g) 275%   h) $5\frac{1}{2}\%$

3. Write each decimal as a percent.
   a) 0.77   b) 2.6   c) 0.081   d) 3.00

   Write each fraction or mixed number as a percent.

   e) $\frac{23}{50}$ f) $\frac{3}{5}$ g) $\frac{7}{12}$ h) $4\frac{2}{5}$

Complete the table. Round to the nearest thousandth, if necessary

	Percent	Fraction	Decimal
i)		$\frac{3}{20}$	
j)	27%		
k)			0.55
l)		$2\frac{1}{6}$	

4. Write each percent as a decimal and a fraction.
   a) A family decides to spend no more than 27.5% on its monthly income on rent. Write 27.5% as a decimal and a fraction.

   b) Provincetown's budget for waste disposal increased by $1\frac{3}{4}$ times over the budget from last year. What percent increase is this?

Teaching Notes:
- Some students have trouble remembering which way to move the decimal point.
- Some students become very confused with converting between percents, fractions, and decimals, and need to see many examples.

Answers: 1) 37%, 63%; 2a) 0.32, b) 0.057, c) 1.2, d) 0.0002, e) 3/20, f) 81/1000, g) 2 ¾ , h) 11/200; 3a) 77%, b) 260%,

c) 8.1%, d) 300%, e) 46%, f) 60%, g) 58.$\bar{3}$% or $58\frac{1}{3}$%, h) 440%, i) 15%, 0.15, j) 27/100, 0.27, k) 55%, 11/20,

l) 216.7%, 2.167; 4a) 0.275,11/40, b)175%

Mini-Lecture 7.2
Solving Percent Problems with Equations

Learning Objectives:

1. Write percent problems as equations.
2. Solve percent problems.
3. Key Vocabulary: *of, is, what number, percent equation..*

Examples:

1. Translate each to an equation. Do not solve.

   a) 12% of 80 is what number?

   b) What percent of 60 is 20?

   c) 40% of what number is 20?

   d) 1.8 is what percent of 9?

2. Solve the following equations for the amount.

   a) What number is 8% of 50?

   b) 20% of 65 is what number?

   c) 125% of 16 is what number?

   d) What number is $15\frac{3}{4}$% of 50?

   e) 70% of what number is 35?

   f) 18 is 4% of what number?

   g) 8.1 is 36% of what number?

   h) 22.5% of what number is 2.7?

   i) What percent of 200 is 16?

   j) 0.06 is what percent of 100?

   k) 210 is what percent of 60?

   l) What percent of 1041 is 333.12?

Teaching Notes:

- Many students get confused between "amount" and "base".
- Some students have better success at solving these types of equations by working in Section 6.4, Solving Percent Problems Using Proportions.

Answers: 1a) (0.12)(80) =x, b) x• 60=20, c) 0.40 x = 20, d) 1.8 = 9x; 2a) 4, b) 13, c) 20, d) 7.875; e) 50, f)450, g) 22.5, h) 12; i) 8%, j) 0.06%, k) 350%, l) 32%

Mini-Lecture 7.3
Solving Percent Problems with Proportions

Learning Objectives:

1. Write precent problems as proportions.
2. Solve percent problems.
3. Key Vocabulary: *percent (p), base (b), amount(a), percent proportion* $\left(\dfrac{a}{b} = \dfrac{p}{100}\right)$.

Examples:

1. Translate each to a proportion. Use n to indicate the unknown. Do not solve.

   a) 50% of 24 is what number?   b) What percent of 40 is 14?

   c) 60% of what number is 2?   d) What percent of 50 is 50?

2. Solve.

   a) 30% of 350 is what number?   b) What number is 8% of 625?

   c) What number is 250% of 60?   d) 20% of 8.5 is what number?

   e) 8% of what number is 4?   f) 84 is 70% of what number?

   g) $5\dfrac{1}{2}$% of what number is $2\dfrac{1}{5}$?   h) 1716 is 143% of what number?

   i) What percent of 120 is 90?   j) 616 is what percent of 560?

   k) 2.1 is what percent of 70?   l) What percent of 800 is 6?

Teaching Notes:

- Remind students that the percent proportion is: $\dfrac{amount}{base} = \dfrac{percent}{100}$
- Many students find it difficult to identify the different parts of the proportion.
- Remind students that the "base" is after the word "of".

Answers: *1a)* $\dfrac{50}{100} = \dfrac{n}{24}$, *b)* $\dfrac{14}{40} = \dfrac{n}{100}$, *c)* $\dfrac{2}{n} = \dfrac{60}{100}$, *d)* $\dfrac{50}{50} = \dfrac{n}{100}$; *2a)* *105, b) 50, c) 150, d) 1.7; e) 50, f) 120, g) 40, h) 1200 i) 75%, j) 110%, k) 3%, l) 0.75%*

Mini-Lecture 7.4
Applications of Percent

<u>**Learning Objectives:**</u>

1. Solve applications involving percent.
2. Find the percent of increase and percent decrease.
3. Key Vocabulary: *percent increase, percent decrease.*

<u>**Examples:**</u>

1. Solve.
   a) 15% of Carol's check of $1200 is paid towards health care. How much money is paid towards health care?

   b) During a recent inspection, the fire department found 112 faulty smoke alarms. If this is 0.08% of the total inspected, how many smoke alarms were inspected?

   c) One day, 18 students were out sick with the flu. What percent of the students were absent if there should be a total of 80 students in the class?

2. Solve.

   a) Find the percent of increase if the original amount was 80 and the new amount is 100.

   b) Find the percent of increase if the original amount was 20 and the new amount is 65.

   c) Recently, a bookstore announced that all their books would increase in price 5%. How much will a book cost if the original price was $4.50. Round to the nearest cent.

   d) Find the percent of decrease if the original amount was 16 and the new amount is 10.

   e) Find the percent of decrease if the original amount was 140 and the new amount is 91.

   f) On a recent shopping trip, a sign read: "Jeans! Originally $40, Now $34!". Find the percent decrease in price.

<u>**Teaching Notes:**</u>

- Most students find this section difficult. Refer students to the following formulas:

$$\% \text{ increase} = \frac{\text{amount of increase}}{\text{original amount}} \quad \text{or} \quad \% \text{ decrease} = \frac{\text{amount of decrease}}{\text{original amount}}$$

Answers: 1a) $180, b) 140,000, c) 22.5%; 2a) 25%, b) 225%, c) $4.73; d) 37.5%, e) 35%, f) 15%

Mini-Lecture 7.5
Percent and Problem Solving: Sales Tax, Commission, and Discount

<u>**Learning Objectives:**</u>

1. Calculate sales tax and total price.
2. Calculate commissions.
3. Calculate discount and sale price.
4. Key Vocabulary: *sales tax, sales tax rate, total price, commission, commission rate, amount of discount, sale price.*

<u>**Examples:**</u>

1. Solve.
   a) Find the sales tax and the total price on the purchase of a $230 DVD player where the sales tax rate is 6.5%.

   b) The sales tax on a $1050 computer system is $63. What is the sales tax rate?

   c) The portable DVD player costs $185 and the leather carrying case costs $30. What is the total paid to the cashier if the sales tax rate is 7%?

2. Solve.
   a) A book salesman is paid a commission of 3.1% of her monthly sales. For the month of August, she sold $180,000 worth of books. What was the amount of her commission for the month?

   b) A salesperson earned a commission of $3,842.50 for selling $53,000 worth of merchandise. Find the salesperson's commission rate.

3. Solve.
   a) Find the amount of discount when the original price is $72 and the discount rate is 20%.

   b) Find the sale price when the original price is $58 and the discount rate is 9%.

   c) A $3300 diamond bracelet is part of a "25% off" sale. Find the discount and the sale price for the bracelet.

<u>**Teaching Notes:**</u>

- Most students find these types of problems difficult and frustrating.
- Refer students to the following formulas:
   Sales Tax = tax rate · purchase price
   Total Price = purchase price + sales tax
   Commission = commission rate · sales
   Amount of Discount = discount rate · original price
   Sale Price = original price − amount of discount

Answers: 1a) $14.95, $244.95, b) 6%, c) $230.05; 2a) $5580, b) 7.25% or 7 ¼%; 3a) $14.40, b) $52.78, c) $825, $2475

Mini-Lecture 7.6
Percent and Problem Solving: Interest

Learning Objectives:

1. Calculate simple interest.
2. Calculate compound interest.
3. Key Vocabulary: *simple interest; principal; rate; time; total amount of a loan; compound interest; compounded- annually, semi-annually, quarterly; compound interest factor.*

Examples:

1. Solve.

   a) Upon graduation, Ayla is given money that totals $4,700. If this money is invested at 9.5% simple interest for 7 years, find the total amount.

   b) Allison borrows $10,500 for $4\frac{1}{2}$ years at a rate of 9.5% simple interest. Find the total amount.

   c) $250,000 is borrowed to buy a house. If the simple interest rate on the 30-year loan is 6.75%, find the total amount paid on the loan.

2. Solve. Round answers to the nearest cent.

   a) Kristen deposited $2,850 in a compound interest account for 5 years. If the account earns 10% interest compounded quarterly, find the total amount. (Compound interest factor is 1.63862)

   b) $4,690 is compounded semi-annually at a rate of 8%. Find the total amount of compound interest earned at the end of 15 years. (Compound interest factor is 3.2434).

   c) $2500 is compounded daily at a rate of 8% for 10 years. Find the total amount.

Teaching Notes:

- Refer students to the following formulas in the textbook:
  Simple Interest = principal · rate · time
  Total Amount = principal + interest
  Compound Interest Tot. Amt. =original principal · compound interest factor
  Monthly Payment = $\dfrac{\text{principal} + \text{interst}}{\text{total number of payments}}$

- Refer students to Appendix A7 for the table of compound interest factors.

Answers: 1a) $7825.50, b) $14,988.75, c) $756,250; 2a) $4670.07, b) $15,211.54, c) $5563.36.

Mini-Lecture 8.1
Reading Pictographs, Bar Graphs, Histograms and Line Graphs

Learning Objectives:
1. Read pictographs.
2. Read and construct bar graphs.
3. Read and construct histograms.
4. Read line graphs.
5. Key Vocabulary: *pictograph, bar graph, histogram, class interval, class frequency, line graph.*
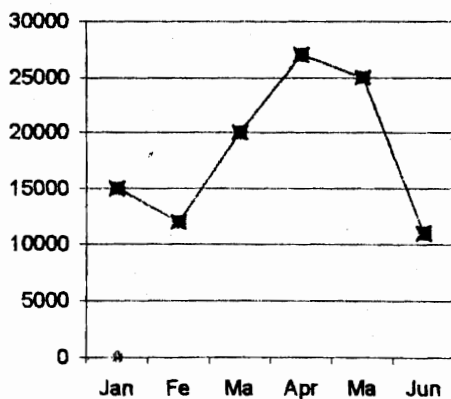
Examples:

1. The following bar graph shows the points scored per quarter in a basketball game.
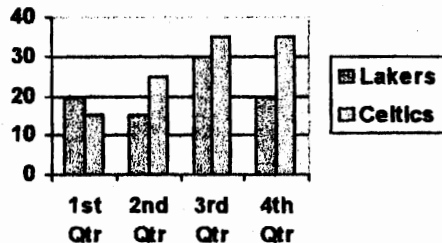
a) How many points did the Celtics score in the 4th quarter?
b) How many points did the Lakers score in the 1st quarter?
c) What was the total score for the game?

3. The following line graph shows the total sales per month.

a) What month had the least sales?
b) What is the difference between the highest and lowest month?

2. The following pictograph shows the number of satisfied customers at a restaurant. Use the information to answer the following questions.

Month	Number of Satisfied Customers
Jan.	☺☺☺☺☺☺
Feb.	☺☺☺
Mar.	☺☺☺☺

☺ = 100 Satisfied Customers
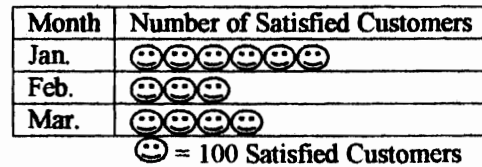
a) Which month had the most satisfied customers?
b) What was the total number of satisfied customers during the 3-month period?

4. The following is a list of scores on a recent math exam. Use this list to complete the frequency distribution table: 100, 85, 89, 75, 60, 55, 92, 85, 85, 76, and 77

	Class Intervals	Tally	Class Frequency
a	90 - 100		
b	80 - 89		
c	70 - 79		
d	60 - 69		
e	Below 60		

Teaching Notes:
- Encourage students to look around their environment and find different graphs.

Answers: 1a) 35, b) 20, c) L=85, C=110; 2a) Jan, b) 1300; 3a) June, b) 16,500; 4a) 2,4,3,1,1

Mini-Lecture 8.2
## Reading Circle Graphs

Learning Objectives:

1. Read circle graphs.
2. Draw circle graphs.
3. Key Vocabulary: *circle graph, protractor, 360°.*

Examples:

1. The freshman class held elections for class president. The following circle graph shows the results of how the 200 students voted. Use the circle graph to answer the accompanying questions.

Votes For Class President

Ray 26%
Amy 33%
Haiwin 15%
Chris 26%
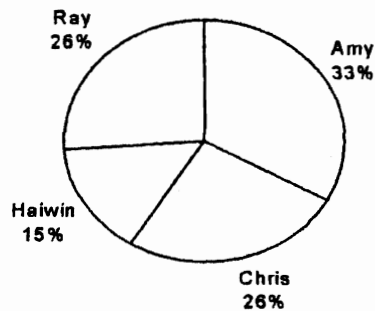
a) Who won the election?

b) Who received the fewest votes?

c) How many votes did the winner receive?

d) Write a ratio of students voting for Haiwin to total number of students.

2. A recent survey of college students asked how many cans of soda did they consume per day. Complete the table and draw a circle graph to represent the information given in the table.

	Number of Cans of Soda Consumed in One Day	Percent of College Students	Degrees of a Circle
a	0	5%	
b	1 - 2	42%	
c	3 - 4	20%	
d	5 - 6	15%	
e	7 or more	18%	

Teaching Notes:

- Remind students that the order of a ratio is important.
- Some students will need instruction on the use of a protractor.
- Encourage students, when drawing a circle graph, to estimate first.

Answers: *1a) Amy, b) Haiwin, c) 66, d) 3/20; 2a) 18°, b) 151.2°, c) 72°, d) 54°, e) 64.8°*

Mini-Lecture 9.1
Lines and Angles

Learning Objectives:

1. Identify lines, line segments, rays, and angles.
2. Classify angels as acute, right, obtuse, or straight.
3. Identify complementary and supplementary angles.
4. Find measures of angles.
5. Key Vocabulary: *space, plane, point, line, line segment, ray, angle, vertex, sides, degrees, straight angle, right angle, acute angle, obtuse angle, complementary angles, supplementary angles, parallel lines, intersecting lines, perpendicular, vertical angles, adjacent angles, transversal, corresponding angles are equal, alternate interior angles are equal.*

Examples:

1. Draw an example of each term.

   a) line   b) ray   c) segment   d) angle

2. Draw an example of each angle.

   a) acute   b) right   c) obtuse   d) straight

3. Find each complementary or supplementary angle as indicated.

   a) Find the complement of a 35° angle.   b) Find the complement of a 71° angle.
   c) Find the supplement of a 152° angle.   d) Find the supplement of a 83° angle.

4. Find the measures of angles x, y, and z in each figure.

   a)   b) m ‖ n
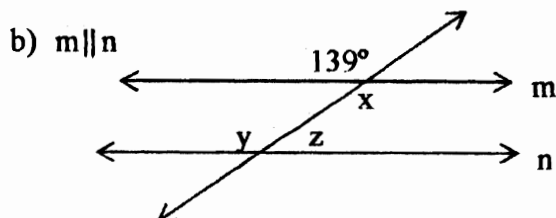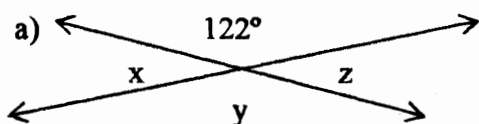
Teaching Notes:

- Some students are unfamiliar with the vocabulary and need repetition.
- Refer students to the textbook, **Chapter Highlights,** for a condensed listing of definitions and concepts.

Answers: 1a) – d) Answers may vary; 2a – d) Answers may vary; 3a) 55°, b) 19°c) 28°, d) 97°; 4a) x =58°, y=122°, z=58°, b) x=139°, y=139°, z=41°
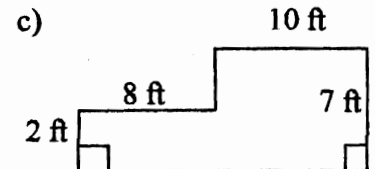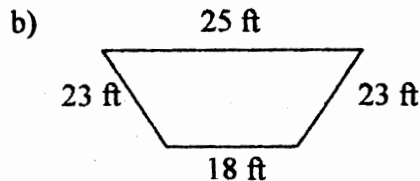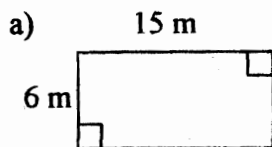
Mini-Lecture 9.2
Perimeter

Learning Objectives:

1. Use formulas to find perimeter.
2. Use formulas to find circumferences.
3. Key Vocabulary: *perimeter, circumference, π*.

Examples:

1. Find the perimeter of the following figures.

a) 15 m 6 m

b) 25 ft 23 ft 23 ft 18 ft

c) 10 ft 8 ft 7 ft 2 ft

   d) A rectangular field measures 441 feet by 108 feet. Find the cost of constructing a fence if fencing costs $29.50 per yd.

2. Find the circumference of each circle. Give the exact and then an approximation by using $\pi = 3.14$. Round to the nearest hundredth.

   a) radius = 7 ft.   b) diameter = 84 m.   c) radius = 34.9 ft

   d) A circular room has a radius of 10.3 feet. Find the distance around the room.

   e) A circular statue has a base with a diameter of 11 ft. Find the distance around the base of the statue.

   f) Find the distance around a circular Jacuzzi with a diameter of 8 ft. For this problem, use $\pi = \dfrac{22}{7}$

Teaching Notes:

- Refer students to textbook for formulas of perimeter and circumference.
- Many students have difficulty understanding the difference between approximation and exact value when working with π.
- Remind students to read carefully and take note of radius vs. diameter.

Answers: 1a) 42 m, b) 89 ft., c) 50 ft., d) $10,797; 2a) 14$\pi$, 43.96 ft, b) 84$\pi$, 263.76 m, c) 69.8$\pi$, 219.17 ft, d) 20.6$\pi$, 64.69 ft, e) 11$\pi$, 34.54 ft., f) 8$\pi$, 27 1/7 ft.
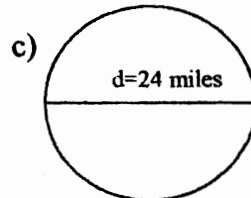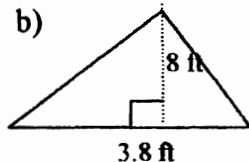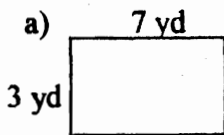
Mini-Lecture 9.3
Area, Volume, and Surface Area

Learning Objectives:
1. Find the area of plane regions.
2. Find the volume and surface area of solids.
3. Key Vocabulary: *area, square units.*

Examples:
1. Find the area of the following. Use $\pi = 3.14$. Round to the nearest hundredth.

a) 7 yd, 3 yd (rectangle) b) 8 ft, 3.8 ft (triangle) c) d=24 miles (circle)

e) A small rug is in the shape of a trapezoid. The bases measure 19.8 in and 22.4 in. and the height is 8 in. Find the area of the rug.

f) A side of a square towel measures 7.5 in. Find how many square inches of material is needed to make 8 towels.

2. Find the volume and surface area of each rectangular solid or cube. Round to the nearest tenth.
   a) Rectangular solid: length = 8.3 in.; width = 3 in.; height = 9 in.
   b) Cube: side = 7.5 cm

Find the volume and surface area of each sphere or circular cylinder. Give the exact answers and an approximate. Use $\pi = 3.14$. Round to the nearest hundredth.
   c) Sphere: diameter = 12 in.
   d) Circular cylinder: radius = 8 feet; height = 3 feet

Find the volume and surface area of each cone or square-based pyramid. If necessary, give the exact answer and an approximate. Use $\pi = 3.14$. Round to the nearest hundredth.
   e) Cone: height = 4 m; radius = 3 m
   f) Square-based pyramid: height = 11 cm; edge of base = 10.5 cm; slant height = 12.19 cm

Teaching Notes:
- Refer students to textbook for **Area Formulas of Common Geometric Figures** and **Area Formula of a Circle.**
- Many students have difficulty when the height lies outside of a triangle, parallelogram, or trapezoid.
- Refer students to the textbook for **Volume and Surface Area Formulas of Common Solids**.
- Some students need to be able to visualize the solids. Encourage students to seek out actual items in their environment for these common solids.
- Remind students that volume is measured in cubic units, and surface area in square units.

Answers: 1a) 21 yd^2, b) 15.2 ft^2, c) 452.16 mi^2, d) 109.88 cm^2, e) 168.8 in^2, f) 450 in^2, : 2a) V=224.1 in^3, SA=253.2 in^2, b) V=421.9 cm^3, SA=337.5 cm^2; c) V=288π in$^3 \approx$ 904.32 in^3, SA=144π in$^2 \approx$ 452.16 in^2, d) V=192π ft^3 $\approx$ 602.88 ft^3, SA=176π ft$^2 \approx$ 552.64 ft^2; e) V= 12π m$^3 \approx$ 37.70 m^3, SA=24π m$^2 \approx$ 75.40 m^2, f) V=404.25 cm^3, SA=366.24 cm^2

Mini-Lecture 9.4
Linear Measurement

Learning Objectives:

1. Define U.S. units of length and convert from one unit to another.
2. Use mixed units of length.
3. Perform arithmetic operations on U.S. units of length.
4. Define metric units of length and convert from one unit to another.
5. Perform arithmetic operations on metric units of length.
6. Key Vocabulary: *U.S. or English measurement system, metric system, inch, foot, yard, mile, unit fraction, kilo, hector, deka, meter, deci, centi, milli.*

Examples:

1. Convert each measurement as indicated.
   a) 72 in to feet   b) 8 yd to feet   c) 3 mi to feet   d) 120 in to yd.

2. Convert each measurement as indicated.

   a) 89 in = __ft __in   b) 4 yd 2 ft = __ in   c) 11,213 ft = ___mi___ft

3. Perform each indicated operation. Simplify the result if possible.

   a) 11 ft 3 in. + 5 ft 10 in.   b) 42 yd 1 ft – 38 yd 2 ft   c) 18 ft 8 in. ÷ 2

   d) A garden is 7 ft. 11 in. long by 8 ft. 7 in. wide. What is the total length of fencing is needed to completely enclose the garden?

4. Convert as indicated.

   a) 60 mm to cm   b) 500 m to km   c) 8.2 m to cm

   d) 34,000 mm to m   e) 3.7 km to m   f) 50.6 mm to dm

5. Perform each indicated operation. Simplify the result if possible.

   a) 26 cm + 11.9m   b) 33 mm – 1.443 cm   c) 4.3 mm ÷ 5

   d) A 2.8-m board has 1.3 cm trimmed from each end. How long is the remaining board?

Teaching Notes:

- Refer students to U.S. **Units of Length** chart and **Metric Units of Length** chart.
- Remind students to always put the unit they are converting to in the numerator of the unit fraction.

Answers: 1a) 6 ft., b) 24 ft., c) 15,840 ft., d) 3 1/3 yd.; 2a) 7 ft. 5 in, b) 168 in., c) 2 mi 653 ft; 3a) 17 ft 1 in, b) 3 yd 2 ft, c) 9 ft 4 in, d) 33 ft; 4a) 6 cm, b) 0.5 km, c) 820 cm, d) 34 m, e) 3700 m, f) 0.506 dm; 5a) 12.16 m, b) 18.57 mm, c) 0.86 mm, d) 277.4 cm or 2.774 m

Mini-Lecture 9.5
Weight and Mass

Learning Objectives:

1. Define U.S. units of weight and convert from one unit to another.
2. Perform arithmetic operations on units of weight.
3. Define metric units of mass and convert from one unit to another.
4. Perform arithmetic operations on units of mass.
5. Key Vocabulary: *weight, ounce, pound, ton, mass, gram, milligram, kilogram.*

Examples:

1. Convert as indicated.

   a) 192 oz = _?_ lb

   b) 8,800 lbs = _?_ ton

   c) $\frac{2}{5}$ oz = _?_ lb

   d) 6.7 lb = _?_ oz

   e) 16 lb 3 oz = _?_ oz

   f) 3.1 ton = _?_ oz

2. Perform each indicated operation.

   a) 37 lb 12 oz + 22 lb 7 oz

   b) 59 lb 2 oz – 18 lb 15 oz

   c) 16 tons 1400 lb ÷ 5

   d) A company wishes to ship 15 boxes of books. If each box weighs 3 lb 10 oz, what is the total weight of 15 boxes?

3. Convert as indicated.

   a) 27 kg = _?_ g

   b) 310 g = _?_ kg

   c) 22 g = _?_ mg

   d) 1,035 mg = _?_ g

   e) 8,360 cg = _?_ kg

   f) 16 hg = _?_ mg

4. Perform each indicated operation.

   a) 11.7 mg + 3.2 mg

   b) 5 g – 1301 mg

   c) 9 kg ÷ 4

   d) A bottle weighs 125 grams. Find the weight in kilograms of 2 dozen bottles.

Teaching Notes:

- Refer students to the **U.S. Units of Weight** chart and the **Metric Units of Mass** chart in the textbook.
- Review the use of unit fractions.
- Remind students that the prefixes are the same in the metric system for mass and length.

Answers: 1a) 12 lb, b) 4.4 ton, c) 1/40 or 0.025 lb, d) 107.2 oz, e) 259 oz, f) 99.2 oz; 2a) 60 lb 3 oz, b) 40 lb 3 oz, c) 6680 lb, d) 54 lb 6 oz; 3a) 27,000g, b) 0.31 kg, c) 22,000 mg, d) 1.035 g, e) 0.0836 kg, f) 1,600,000 mg.; 4a) 14.9 mg, b) 3.699g, c) 2.25 kg, d) 3 kg

Mini-Lecture 9.6
Capacity

Learning Objectives:

1. Define U.S. units of capacity and convert from one unit to another.
2. Perform arithmetic operations on U.S. units of capacity.
3. Define metric units of capacity and convert from one unit to another.
4. Perform arithmetic operations on metric units of capacity.
5. Key Vocabulary: *capacity, fluid ounces, cup, pint, quart, gallon, liter, kilo, hector, deka, deci, centi, milli.*

Examples:

1. Convert each measurement as indicated.

   a) 72 fl oz = _?_ c

   b) 10 pt = _?_ c

   c) $6\frac{1}{2}$ qt = _?_ pt

   d) 26 qt = _?_ gal

   e) $3\frac{1}{8}$ qt = _?_ fl oz

   f) 5 gal = _?_ fl oz

2. Perform each indicated operation.

   a) 8 gal 5 qt + 6 gal 2 qt

   b) 5 pt – 2 pt 1 c

   c) 3 gal 8 cups × 3

   d) A recipe calls for 45 fluid ounces of water. How many cups is this?

3. Convert each measurement as indicated.

   a) 6 L = _?_ ml

   b) 3.2 L = _?_ cl

   c) 1800 ml = _?_ L

   d) 0.135 L = _?_ kl

   e) 0.072 dl = _?_ ml

   f) 43,000 L = _?_ hl

4. Perform each indicated operation.

   a) 17.5 L + 16.8 L

   b) 12,520 ml – 0.6 L

   c) 13.5 L ÷ 1.8

   d) A chemistry student accidentally added 69 cl of a chemical to a mixture instead of 38 ml. How much extra of the chemical did the student add?

Teaching Notes:

- Refer students to **U.S. Units of Capacity chart** and **Metric Unit of Capacity chart** in textbook.
- Remind students to use unit fractions whenever possible.
- With metrics, many students will memorize prefixes and move the decimal point accordingly.

Answers: 1a) 9c, b) 20c, c) 13 pt, d) 6.5 gal, e) 100 fl oz, f) 640 fl oz; 2a) 15 gal 3 qt, b) 2 pt 1 c, d) 10 gal 8 c; 3a) 6000 ml, b) 320 cl, c) 1.8 L, d) 0.000135 kl, e) 7.2 ml, f) 430 hl; 4a) 34.3 L, b) 11.92L, c) 7.5L, d) 652 ml

Mini-Lecture 9.7
Temperature and Conversions
Between the U.S. and Metric Systems

Learning Objectives:

1. Convert between the U.S. and metric system.
2. Convert temperature from degrees Celsius to degrees Fahrenheit.
3. Convert temperature from degrees Fahrenheit to degrees Celsius.

Examples:

1. Convert as indicated. If necessary, round answers to two decimal places.

   a) 12 km = _?_ mi   b) 6 in = _?_ cm   c) 5.5 ft = _?_ m

   d) 20 L = _?_ gal   e) 34 qt = _?_ L   f) 27 L = _?_ qt

   g) 3 kg = _?_ lb   h) 16 oz = _?_ g   i) 14.3 lb = _?_ kg

2. Covert from degrees Celsius to degrees Fahrenheit. When necessary, round to the nearest tenth of a degree.
   a) 60°C to degrees Fahrenheit
   b) 32°C to degrees Fahrenheit
   c) 50°C to degrees Fahrenheit

3. Convert from degrees Fahrenheit to degrees Celsius. When necessary, round to the nearest Tenth of a degree.
   a) 68° F to degrees Celsius
   b) 113° F to degrees Celsius
   c) 20° F to degrees Celsius

Teaching Notes:

- Remind students to use their unit fractions.
- Refer students to the textbook for conversions involving length, capacity, and weight.
- Some students may need to find objects that correspond to the conversions so they can visualize these equivalences.

Answers: 1a) 7.44 mi., b) 15.24 cm., c) 1.65 m., d) 5.2 gal, e) 32.3 L, f) 28.62 qt, g) 6.6 lb., h) 453.6 g, i) 6.44 k; 2a) 140° F, b) 89.6°F, c) 122° F; 3a)20° C b)45°C, c)-6.7 C