Homework Helpers

Grade 4
Module 7

G4-M7-Lesson 1

1. Complete the tables.

a.

Yards	Feet
1	3
4	12
10	30

b.

Feet	Inches
1	12
3	36
9	108

c.

Yards	Inches
1	36
2	72
4	144

> 1 yard = 3 feet. I multiply the number of yards by 3 to find the number of feet.

> 1 foot = 12 inches. I multiply the number of feet by 12 to find the number of inches.

> 1 yard = 3 feet, and 1 foot = 12 inches. To find the number of inches in 1 yard, I can multiply, $3 \times 12 = 36$. Now I multiply the number of yards by 36 to find the number of inches.

2. Solve.

a. 3 yards 2 inches = __110__ inches

> There are 36 inches in 1 yard. 3×36 inches = 108 inches.

b. 12 yards 4 feet = __40__ feet

> There are 3 feet in 1 yard. 12×3 feet = 36 feet.

c. 3 yards 1 foot = __120__ inches

> I can solve this two ways: Convert yards and feet to inches, or convert yards to feet and then feet to inches.

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Lesson 1:   Create conversion tables for length, weight, and capacity units using measurement tools, and use the tables to solve problems.

3. Complete the table.

Pounds	Ounces
1	16
3	48
5	80

> 1 pound = 16 ounces. I multiply the number of pounds by 16 to find the number of ounces.

4. Ronald's cat weighs 9 pounds 3 ounces. How many ounces does his cat weigh?

9 *pounds* 3 *ounces*

16 oz	16 oz	16 oz	16 oz	16 oz	16 oz	16 oz	16 oz	16 oz	3 oz
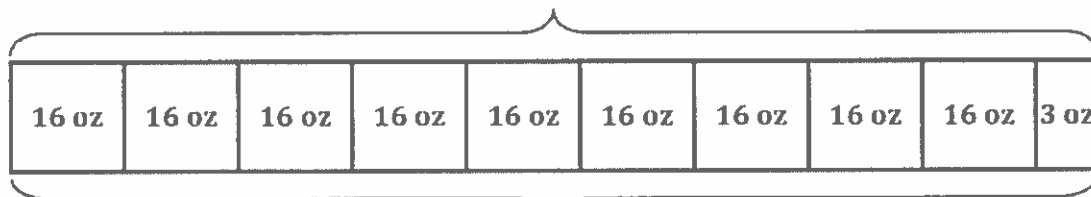
T

1 *unit:* 16 *ounces*

9 *units:* 144 *ounces*

$T = 144\ ounces + 3\ ounces$

$T = 147\ ounces$

Ronald's cat weighs 147 *ounces.*

$$\begin{array}{r} 1\ 6 \\ \times\quad 9 \\ \hline 1\ 4\ 4 \end{array}$$

> I can draw a tape diagram with 9 units of 16 ounces and 1 unit of 3 ounces because the cat weighs 9 pounds 3 ounces and each pound equals 16 ounces.

> I can multiply 9 × 16 to find the number of ounces in 9 pounds. Then I can add 3 more ounces to find the total number of ounces.

5. Answer *true* or *false* for the following statement. If the statement is false, change the right side of the comparison to make it true.

2 kilograms < 1,900 grams   _*false*_

2,001 *grams*

1 kilogram = 1,000 grams
2 × 1,000 grams = 2,000 grams
2 kilograms = 2,000 grams

> The statement is false because 2,000 grams is not less than 1,900 grams. The number on the right has to be greater than 2,000.

Lesson 1:   Create conversion tables for length, weight, and capacity units using measurement tools, and use the tables to solve problems.

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G4-M7-Lesson 2

Use the RDW process to solve Problems 1 and 2.

1. Lucy buys 2 gallons of milk. How many cups of milk does she have?

2 gallons
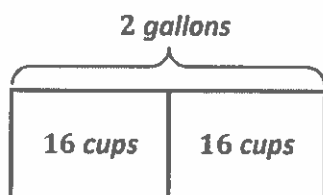
16 cups	16 cups

> I can draw a tape diagram with 2 units of 16 cups because Lucy bought 2 gallons of milk and each gallon is the same as 16 cups.
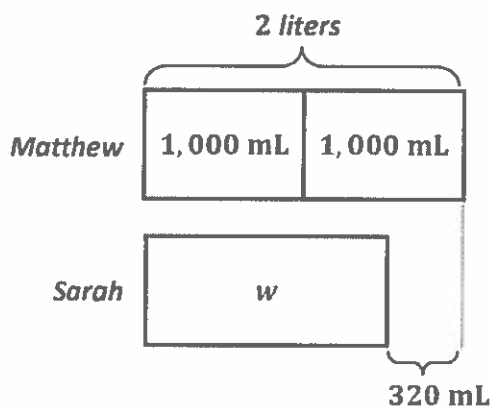
1 unit: **16 cups**

2 units: 2×16 *cups* $= 32$ *cups*

Lucy has 32 cups of milk.

> I multiply 2×16 cups to find the number of cups in 2 gallons.

2. Matthew drank 2 liters of water today, which was 320 milliliters more water than Sarah drank today. How much water did Sarah drink today?

2 liters

Matthew | 1,000 mL | 1,000 mL

Sarah | w

320 mL

> I draw tape diagrams to represent the amount of water Matthew and Sarah drank. Matthew's tape diagram is longer than Sarah's because he drank 320 more milliliters of water than she did.

$1 L = 1,000$ mL

$2 L = 2,000$ mL

$w = 2,000$ mL $- 320$ mL

$w = 1,680$ mL

Sarah drank $1,680$ mL *of water today.*

> I convert the amount of water Matthew drank, 2 liters, into milliliters. Then, I subtract from 2,000 mL the excess amount of water that Matthew drank, which is 320 mL. This tells me how much water Sarah drank.

3. Complete the tables.

a.

Gallons	Quarts
1	4
3	12
5	20

b.

Quarts	Pints
1	2
4	8
8	16

1 gallon = 4 quarts. I multiply the number of gallons by 4 to find the number of quarts.

1 quart = 2 pints. I multiply the number of quarts by 2 to find the number of pints.

4. Solve.

   a.   5 gallons 3 quarts = ___23___ quarts

There are 4 quarts in 1 gallon.
5×4 quarts = 20 quarts.

   b.   25 gallons 2 quarts = ___408___   cups

I can solve this two ways: Convert gallons and quarts to cups, or convert gallons to quarts and then all quarts to cups.

5. Answer *true* or *false* for the following statement. If your answer is false, make the statement true by correcting the right side of the comparison.

6 pints > 3 quarts 1 cup   *false*

       2 quarts 1 cup

2 pints = 1 quart
3×2 pints = 6 pints
3 quarts 1 cup = 6 pints 1 cup

The statement is false because 6 pints is not greater than 6 pints 1 cup. The number on the right has to be less than 3 quarts.

4   Lesson 2:   Create conversion tables for length, weight, and capacity units using measurement tools, and use the tables to solve problems.

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G4-M7-Lesson 3

Use RDW to solve Problem 1.

1. Benjamin's football practice ends at 5:00 p.m. If practice starts at 3:00 p.m., how many minutes long is practice? Use the number line to show your work.

2 hours

1 *hour* = 60 *minutes*

2 *hours* = 120 *minutes*

> I plot the times on the number line.
> Then, I convert the hours to minutes.

Benjamin's practice lasts for **120** *minutes.*

2. Complete the following conversion tables.

a.

Hours	Minutes
1	60
3	180
6	360

> 1 hour = 60 minutes
> I multiply the number of hours by 60 to find the number of minutes.

b.

Days	Hours
1	24
2	48
4	96

> 1 day = 24 hours
> I multiply the number of days by 24 to find the number of hours.

3. Solve.

    a.   9 hours 20 minutes = _____560_____ minutes

> There are 60 minutes in 1 hour.
> 9×60 minutes = 540 minutes.

    b.   5 minutes 45 seconds = _____345_____ seconds

> There are 60 seconds in 1 minute.
> 5×60 seconds = 300 seconds.

    c.   3 days 15 hours = _____87_____ hours

> There are 24 hours in 1 day.
> 3×24 hours = 72 hours.

4. In the 1860s, it took a steamship about 1 week 2 days to cross the Atlantic Ocean. How many hours are there in 1 week 2 days?

1 week 2 days

x
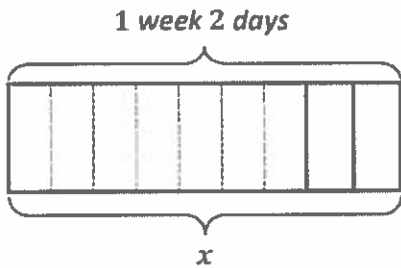
> I can draw a tape diagram to represent 1 week 2 days. I know that there are 7 days in 1 week, so 1 week 2 days = 9 days. I can partition my tape diagram into 9 units to represent 9 days.

1 unit: 1 day = 24 hours

9 units: 9×24 hours = 216 hours

$x = 216$ hours

$$\begin{array}{r} 2\ \ 4 \\ \times\ \ \ \ \ 9 \\ \hline 2\ \ 1\ \ 6 \end{array}$$

> I can multiply 9×24 to find the total number of hours in 9 days, or 1 week 2 days.

There are 216 hours in 1 week 2 days.

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G4-M7-Lesson 4

Use RDW to solve the following problems.

1. Rebecca painted her bathroom in 2 hours. It took her twice as long to paint her kitchen. How many minutes did Rebecca spend painting her bathroom and kitchen?
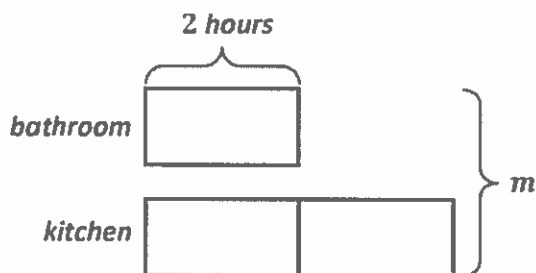
> I draw 1 unit of 2 hours to represent the amount of time Rebecca spends painting her bathroom. I draw 2 units of 2 hours to represent the amount of time she spends painting her kitchen.

1 unit: 2 hours

3 units: 3×2 hours = 6 hours

$m = 6 \times 60$ *minutes*

$m = 360$ *minutes*

Rebecca spent 360 minutes painting her bathroom and kitchen.

2. Mason's little sister weighed 7 pounds 9 ounces at birth. At her 6-month check-up, Mason's little sister weighed 16 pounds. How many ounces did Mason's little sister gain?
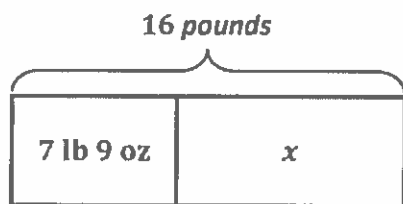
> I draw a tape diagram to represent the problem. I know a part and the whole. I subtract to find the unknown part. Then, I convert 8 pounds to ounces and add 7 more ounces.

16 pounds − 7 pounds 9 ounces = 8 pounds 7 ounces

15 pounds   16 ounces

$x = 8$ *pounds 7 ounces* $= (8 \times 16$ *ounces*$) + 7$ *ounces* $= 128$ *ounces* $+ 7$ *ounces* $= 135$ *ounces*

Mason's little sister gained 135 ounces.

EUREKA MATH™   Lesson 4:   Solve multiplicative comparison word problems using measurement conversion tables.

3. Melissa stocks 16 quarts of chocolate milk in the refrigerated case at a grocery store. She puts twice as many quarts of whole milk as chocolate milk in the case. Melissa stocks 7 fewer quarts of almond milk than whole milk in the case.

   a. How many quarts of almond milk did Melissa stock in the refrigerated case?

16 *quarts*

chocolate milk

whole milk

almond milk
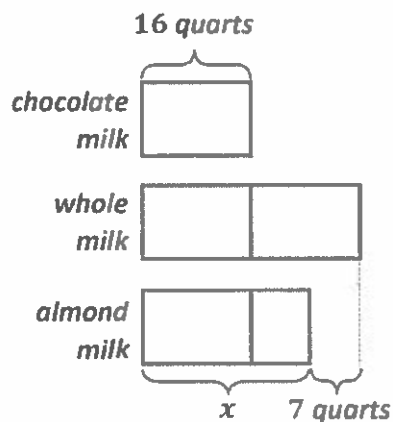
x **7** *quarts*

> The tape diagrams show the relationships among the different amounts of each type of milk Melissa stocked. The amount of whole milk is equal to 2 units of chocolate milk. The amount of almond milk is 7 quarts less than the almond milk.

1 *unit:* **16** *quarts*

2 *units:* 2×16 *quarts* $= 32$ *quarts*

$x = 32$ *quarts* $- 7$ *quarts*

$x = 25$ *quarts*

> I find the amount of whole milk by doubling the amount of chocolate milk. I find the amount of almond milk by subtracting 7 quarts from the amount of whole milk.

Melissa stocked **25** *quarts of almond milk.*

   b. Is the total number of quarts of chocolate milk, whole milk, and almond milk more than the 18 gallons of skim milk that are in the refrigerated case? Explain your answer.

16 *quarts* $+$ **32** *quarts* $+$ **25** *quarts* $=$ **73** *quarts*

18 *gallons* $=$ **18** $\times$ **4** *quarts* $=$ **72** *quarts*

Yes, the total number of quarts of whole milk, chocolate milk, and almond milk is more than the 18 gallons of skim milk. 18 gallons is the same as 72 quarts, and the total for the other types of milk is 73 quarts. There is 1 fewer quart of skim milk than the other types of milk combined.

Lesson 4:   Solve multiplicative comparison word problems using measurement conversion tables.

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G4-M7-Lesson 5

Draw a tape diagram to solve the following problem.

1. Sandy bought a 3-pound bag of flour. Adriana used 11 ounces of that flour to make cookies. Dave used 4 ounces more of that flour than Adriana to make banana bread. How many ounces of flour were left in Sandy's bag?

11 ounces + 11 ounces + 4 ounces = 26 ounces

3 pounds = 3 × 16 ounces = 48 ounces

s = 48 ounces − 26 ounces

s = 22 ounces

Sandy has 22 ounces of flour left.
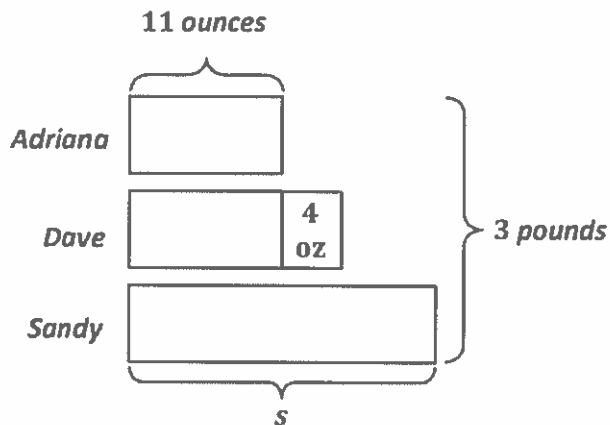
> I can draw tape diagrams to represent the amount of flour Adriana and Dave used and the amount of flour Sandy still has.

> After I find the amount of flour Dave and Adriana used, which is 2 units of 11 ounces plus 4 more ounces, I convert 3 pounds to ounces and subtract.

2. Create a problem of your own using the diagram below, and solve for the unknown.

2 hours

Kyle

Caden   ?

Jenna
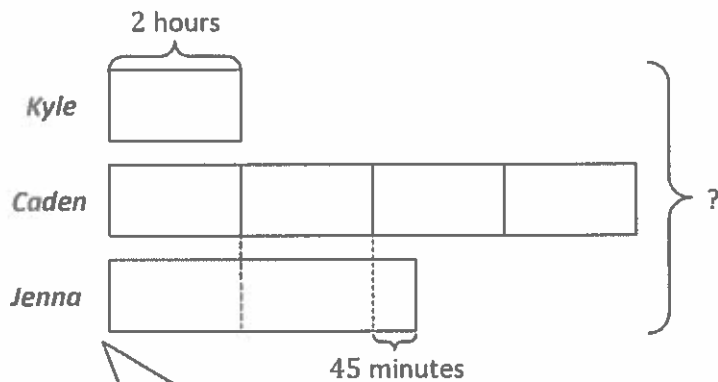
45 minutes

I see 3 things that are being compared in the tape diagrams, and the units are hours and minutes. I can write a word problem about amount of time spent reading because that will make sense with hours and minutes.

I label the tape diagram with the information from the word problem.

Kyle read for 2 hours last week. Caden read four times as long as Kyle read last week. Jenna read 45 minutes more than half the time that Caden read. What is the total number of minutes they read last week?

7×2 hours $= 14$ hours

14 hours 45 minutes $= (14 \times 60$ minutes$) + 45$ minutes $= 840$ minutes $+ 45$ minutes $= 885$ minutes

Kyle, Caden, and Jenna read for a total of 885 minutes last week.

The tape diagrams show 7 units of 2 hours plus 45 minutes, which is equal to 14 hours 45 minutes. I multiply 14×60 to convert the hours to minutes. Then, I add 45 minutes to find the total number of minutes, 885 minutes.

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$$1 \text{ gal} = 8 \text{ pt}$$
$$1 \text{ gal} = 4 \text{ qt}$$
$$1 \text{ qt} = 2 \text{ pt}$$
$$1 \text{ pt} = 2 \text{ c}$$

G4-M7-Lesson 6

1. Determine the following sums and differences. Show your work.

a. 2 gal 3 qt + 2 qt = __3__ gal __1__ qt

1 qt   1 qt

> I decompose and rename units to help me solve. Then, I add or subtract like units.

b. 5 qt − 3 pt = __3__ qt __1__ pt $3 \text{ pt} \xrightarrow{+1 \text{ pt}} 2 \text{ qt} \xrightarrow{+3 \text{ qt}} 5 \text{ qt}$

1 qt 1 pt

> I use the arrow way counting up to 5 quarts from 3 pints. I rename 3 pints as 1 quart 1 pint and then add on 1 pint to reach 2 quarts. Finally, I add on 3 quarts to reach 5 quarts. The answer is the sum of what was added on.

c. 7 gal 1 pt − 2 pt = __6__ gal __7__ pt

6 gal   9 pt

> I rename 1 gallon as 8 pints.

d. 2 qt 3 c + 3 c = __3__ qt __2__ c   2 qt 3 c + 3 c = 2 qt 6 c = 3 qt 2 c

1 qt   2 c

2. The capacity of the container is 4 gallons 2 quarts of liquid. Right now, 1 gallon 3 quarts of liquid are in the container. How much more liquid will the container hold?
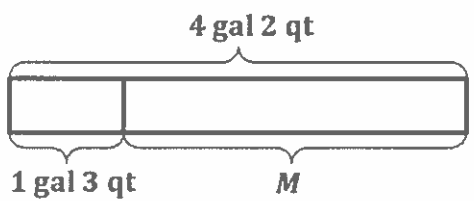
4 gal 2 qt

1 gal 3 qt   M

4 gal 2 qt − 1 gal 3 qt = 2 gal 3 qt

3 gal   6 qt

$M = 2 \text{ gal } 3 \text{ qt}$

The container will hold 2 gallons 3 quarts more liquid.

> I rename 4 gallons 2 quarts as 3 gallons 6 quarts so that there are enough quarts to subtract 3 quarts.

3. Grant and Emma follow the recipe in the table to make punch.

    a. How much punch does the recipe make?

P
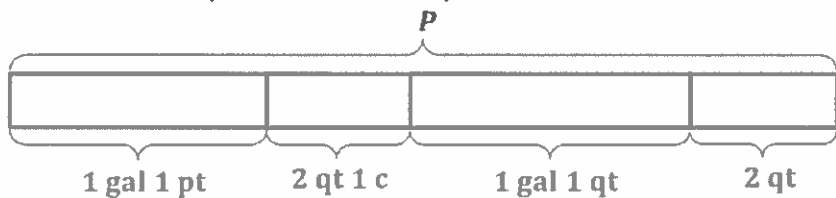
Punch Recipe	
Ingredient	Amount
Fruit Punch	1 gal 1 pt
Ginger Ale	2 qt 1 c
Pineapple Juice	1 gal 1 qt
Orange Sherbet	2 qt

| 1 gal 1 pt | 2 qt 1 c | 1 gal 1 qt | 2 qt |

$P = 1$ gal 1 pt $+ 2$ qt 1 c $+ 1$ gal 1 qt $+ 2$ qt
$ = 2$ gal 5 qt 1 pt 1 c

1 gal   4 c   2 c

$ = 3$ gal 7 c

I could rename this as 3 gallons 1 quart 3 cups, but naming a measurement with 3 units is uncommon. I think to other measurements with 2 units: hours and minutes, weeks and days, feet and inches, pounds and ounces, and dollars and cents.

The recipe makes 3 gallons 7 cups of punch.

b. How many more cups of liquid would they need to fill a 5-gallon container?

$$3 \text{ gal } 7 \text{ c} \xrightarrow{+9 \text{ c}} 4 \text{ gal} \xrightarrow{+16 \text{ c}} 5 \text{ gal}$$

They would need 25 more cups of liquid to fill a 5-gallon container.

There are 16 cups in 1 gallon. I count up 9 cups to reach 4 gallons, and then I add 16 cups, or 1 gallon, to reach 5 gallons.

Lesson 6:   Solve problems involving mixed units of capacity.   EUREKA MATH™

G4-M7-Lesson 7

| 1 ft = 12 in |
| 1 yd = 3 ft |

1. Determine the following sums and differences. Show your work.

   a. 3 yd 1 ft + 4 ft = __4__ yd __2__ ft

       3 yd 1 ft + 4 ft = 3 yd 5 ft = 4 yd 2 ft
                                  ∧
                           1 yd   2 ft

   > I add like units and then rename 5 feet as 1 yard 2 feet. I add 1 yard to 3 yards.

   b. 5 yd – 2 ft = __4__ yd __1__ ft

       ∧
   4 yd 3 ft

   > I rename 5 yards as 4 yards 3 feet in order to subtract 2 feet.

   c. 3 ft 7 in – 8 in = __2__ ft __11__ in
       ∧
   2 ft 19 in

   > I try to subtract like units, but I can't take 8 inches from 7 inches. I rename 3 feet 7 inches as 2 feet 19 inches by taking 1 foot from 3 feet and renaming it as 12 inches and then adding the 7 inches. Then I can subtract 8 inches.

   d. 3 ft 8 in + 4 ft 8 in = __8__ ft __4__ in

       3 ft 8 in + 4 ft 8 in = 7 ft 16 in = 8 ft 4 in
                                        ∧
                                 1 ft   4 in

2. The height of the tree is 13 feet 8 inches. The height of the bush is 3 feet 10 inches shorter than the height of the tree. What is the height of the bush?

   13 ft 8 in
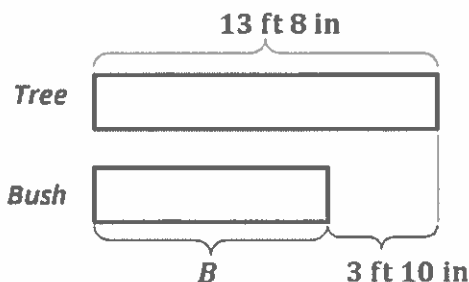
   Tree [   ]

   Bush [   ]

           B   3 ft 10 in

   13 ft 8 in – 3 ft 10 in = 9 ft 10 in
                    ∧
   12 ft   20 in

   B = 9 ft 10 in

   The height of the bush is 9 feet 10 inches.

3. The width of Saisha's rectangular-shaped tree house is 7 feet 6 inches. The perimeter of the tree house is 35 feet.

    a. What is the length of Saisha's tree house?

    35 ft

    7 ft 6 in

    7 ft 6 in   7 ft 6 in   L   L

    L
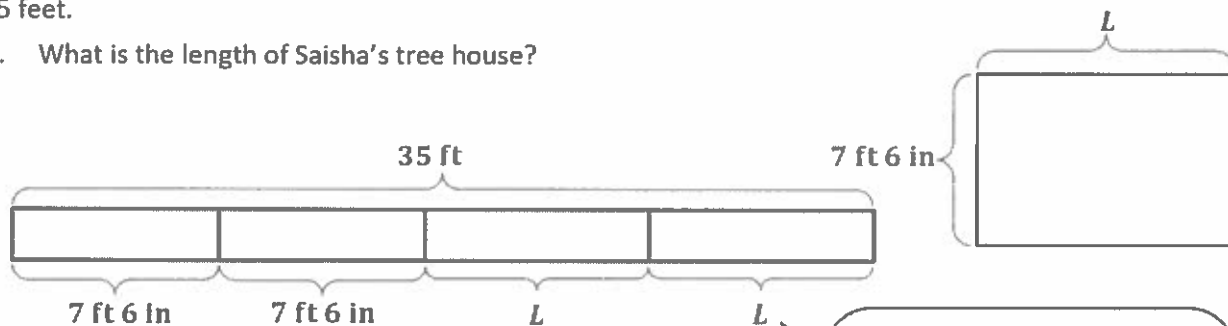
    7 ft 6 in

    $7 \text{ ft } 6 \text{ in} + 7 \text{ ft } 6 \text{ in} + L + L = 35 \text{ ft}$
    $14 \text{ ft } 12 \text{ in} + L + L = 35 \text{ ft}$
    $15 \text{ ft} + L + L = 35 \text{ ft}$
    $L + L = 20 \text{ ft}$
    $L = 10 \text{ ft}$

    The tape diagram helps me to solve this problem. I see that if I subtract the widths from the perimeter that the difference is two times as much as the length.

    The length of Saisha's tree house is 10 feet.

    I know the perimeter is 35 feet. I subtract the two widths from the perimeter to get the sum of the two lengths.
    $35 \text{ ft} - 15 \text{ ft} = 20 \text{ ft}$
    $10 \text{ ft} + 10 \text{ ft} = 20 \text{ ft}$

    b. How much longer is the length of Saisha's treehouse than the width?

    10 ft

    Length

    Width

    7 ft 6 in   D

    $D = 10 \text{ ft} - 7 \text{ ft } 6 \text{ in}$
    9 ft   12 in
    $= 2 \text{ ft } 6 \text{ in}$
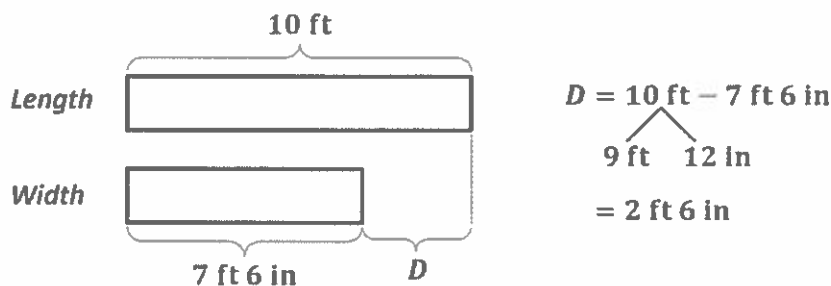
    The length of Saisha's treehouse is 2 feet 6 inches longer than the width.

Lesson 7:   Solve problems involving mixed units of length.

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G4-M7-Lesson 8

$$1 \text{ lb} = 16 \text{ oz}$$

1. Determine the following sum and difference. Show your work.

    a. $6 \text{ lb } 7 \text{ oz} + 4 \text{ lb } 9 \text{ oz} = \underline{\quad 11 \quad} \text{ lb}$

    b. $10 \text{ lb } 4 \text{ oz} - 4 \text{ lb } 9 \text{ oz} = \underline{\quad 5 \quad} \text{ lb } \underline{\quad 11 \quad} \text{ oz}$

    $6 \text{ lb } 7 \text{ oz} + 4 \text{ lb } 9 \text{ oz} = 10 \text{ lb } 16 \text{ oz} = 11 \text{ lb}$

    $4 \text{ lb } 9 \text{ oz} \xrightarrow{+7 \text{ oz}} 5 \text{ lb} \xrightarrow{+5 \text{ lb}} 10 \text{ lb} \xrightarrow{+4 \text{ oz}} 10 \text{ lb } 4 \text{ oz}$

    > Just like adding units of capacity or length, I add like units and rename.

    > I choose to use the arrow way to solve. I count up to reach the next whole pound. I add to find how many I count up in all. That's the same as the difference.

2. On her first birthday, Gwen weighed 23 pounds 12 ounces. On her second birthday, Gwen weighed 30 pounds 8 ounces. How much weight did Gwen gain between her first and second birthday?

    23 lb 12 oz   W

    First birthday

    Second birthday
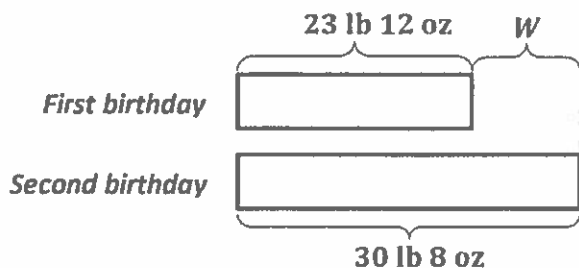
    30 lb 8 oz

    $W = 30 \text{ lb } 8 \text{ oz} - 23 \text{ lb } 12 \text{ oz}$

    29 lb   24 oz

 $= 6 \text{ lb } 12 \text{ oz}$

    > I think of 30 pounds 8 ounces as 29 pounds 16 ounces plus 8 ounces. I subtract like units to get my answer.

    Gwen gained 6 pounds 12 ounces between her first and second birthday.

3. Use the information in the chart about Hayden's school supplies to answer the following question:

    On Monday, Hayden packs her supply case, a notebook, and a textbook into her empty backpack. How much does Hayden's full backpack weigh on Monday?

    | Textbook 3 lb 8 oz | Supply Case 1 lb | Binder 2 lb 5 oz |
    | Laptop 5 lb 12 oz | Notebook 11 oz | Backpack (empty) 2 lb 14 oz |

    B

    1 lb   11 oz   3 lb 8 oz   2 lb 14 oz
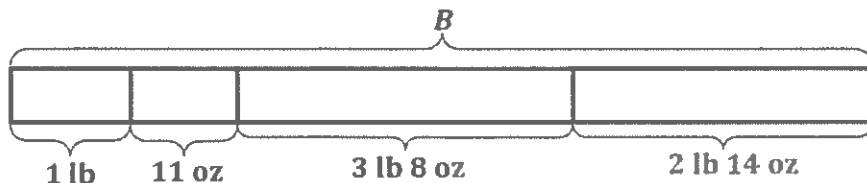
    $B = 1 \text{ lb} + 11 \text{ oz} + 3 \text{ lb } 8 \text{ oz} + 2 \text{ lb } 14 \text{ oz}$

    $= 6 \text{ lb } 33 \text{ oz}$

    2 lb   1 oz

    $= 8 \text{ lb } 1 \text{ oz}$

    > I draw a number bond to show 33 ounces as 2 pounds 1 ounce.

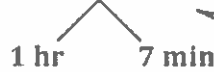   *Hayden's full backpack weighed 8 pounds 1 ounce on Monday.*

G4-M7-Lesson 9

1 day = 24 hr
1 hr = 60 min
1 min = 60 sec

1. Determine the following sum and difference. Show your work.

   a. 6 hr 26 min + 4 hr 41 min = __11__ hr __7__ min

   6 hr 26 min + 4 hr 41 min = 10 hr 67 min = 11 hr 7 min

   1 hr   7 min

   > I add like units just as with fractions or other measurement units.

   b. 36 min 42 sec − 24 min 56 sec = __11__ min __46__ sec

   36 min 42 sec − 24 min 56 sec = 36 min 46 sec − 25 min = 11 min 46 sec
   +4 sec   +4 sec

   > I use compensation as a strategy to solve. I add 4 seconds to each time. The difference remains the same. Subtracting just one unit, minutes, is easier than subtracting mixed units.

2. Ciera finished the race in 3 minutes 31 seconds. She beat Sarah's time by 47 seconds. What was Sarah's time?

   3 min 31 sec   47 sec

   Ciera

   Sarah

   T
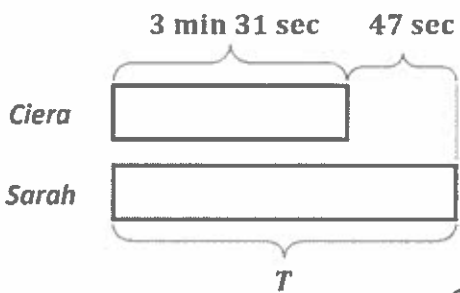
   > Since Ciera beat Sarah's time, Ciera's tape is going to be shorter.

   T = 3 min 31 sec + 47 sec
   = 3 min 78 sec

   1 min   18 min

   = 4 min 18 sec

   > Adding like units is an efficient way to solve.

   Sarah's time was 4 minutes 18 seconds.

Lesson 9: Solve problems involving mixed units of time.

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G4-M7-Lesson 10

1. On Saturday, Andrew used 1 pint 1 cup of paint from a full gallon container to paint the porch steps. On Sunday, he used twice as much paint from the container as he did on Saturday. How much paint was left in the container after Sunday?

1 *gallon*

| 1 pt 1 c | 1 pt 1 c | 1 pt 1 c | |

Saturday   *Sunday*   C
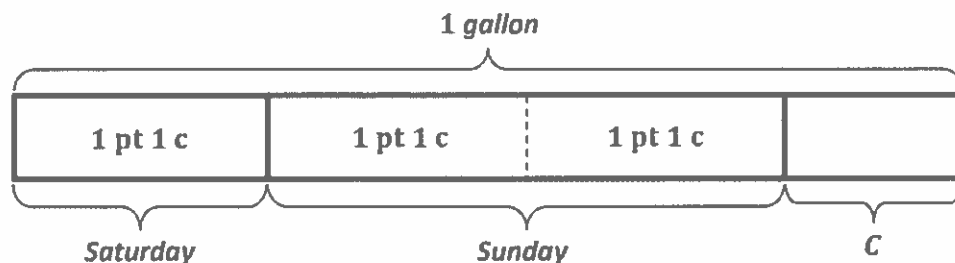
$1 \text{ pt } 1 \text{ c} + 1 \text{ pt } 1 \text{ c} + 1 \text{ pt } 1 \text{ c} = 3 \text{ pt } 3 \text{ c} = 4 \text{ pt } 1 \text{ c}$

> To find the total paint used, I solve for 3 units of 1 pint 1 cup.

1 pt   1 c

> I rename 1 gallon as 8 pints. I rename 8 pints as 7 pints 2 cups. I subtract the total amount of paint used.

$C = 8 \text{ pt} - 4 \text{ pt } 1 \text{ c} = 3 \text{ pt } 1 \text{ c}$

7 pt   2 c

There were 3 pints 1 cup of paint left in the container after Sunday.

2. Shyan is 4 feet 7 inches tall. Her brother is 1 foot 5 inches taller than she is, and her sister is half as tall as her brother. How tall is Shyan's sister?

4 ft 7 in   1 ft 5 in

Shyan

Brother

Sister

T
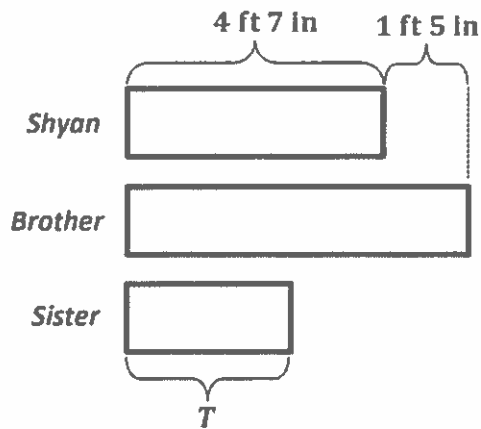
Brother: $4 \text{ ft } 7 \text{ in} + 1 \text{ ft } 5 \text{ in} = 5 \text{ ft } 12 \text{ in} = 6 \text{ ft}$

$T = 6 \text{ ft} \div 2 = 3 \text{ ft}$

Shyan's sister is 3 feet tall.

> The tape diagram helps me to see the relationship between Shyan's height, her brother's height, and her sister's height. I find her brother's height, and then I divide by 2.

G4-M7-Lesson 11

1. A rectangular sidewalk is 2 feet 9 inches wide. Its length is three times the width plus 5 more inches. How long is the sidewalk?

T   5 in

2 ft 9 in

The sidewalk is 8 feet 8 inches long.

The distributive property helps me to solve.
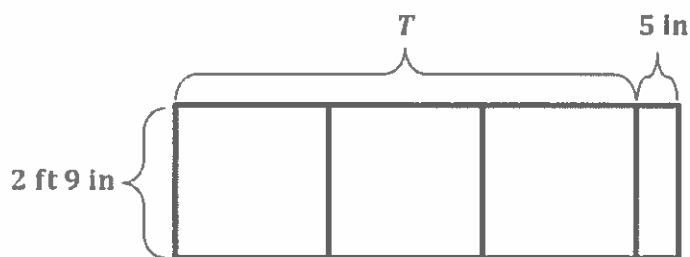
To find the length, I triple the width and add 5 inches.

$T = 3 \times (2 \text{ ft } 9 \text{ in}) + 5 \text{ in}$
$= (3 \times 2 \text{ ft}) + (3 \times 9 \text{ in}) + 5 \text{ in}$
$= 6 \text{ ft} + 27 \text{ in} + 5 \text{ in}$
$= 6 \text{ ft} + 32 \text{ in}$

2 ft   8 in

$= 8 \text{ ft } 8 \text{ in}$

2. Mr. Lalonde plans to make his world-famous cookies. He has 2 pounds 3 ounces of brown sugar. This is $\frac{1}{3}$ of the total amount of brown sugar needed. If he uses 7 ounces of brown sugar for each batch of cookies, how many batches of cookies can he make?

2 lb 3 oz

B

I triple the amount of brown sugar that Mr. Lalonde already has.

2 lb 3 oz = 35 oz

16 oz   16 oz

```
      3   5
  ×       3
 ---1------
  1   0   5
```

$B = 3 \times 35 \text{ oz} = 105 \text{ oz}$

105 oz

7 oz   ...?...

C

number of 7 oz groups

I divide by 7 to find the number of batches he can make.

```
        1   5
  7 | 1  0   5
  -    7
      3   5
  -   3   5
  --------
          0
```

$C = 15$

Mr. Lalonde can make 15 batches of cookies.

Lesson 11:   Solve multi-step measurement word problems.

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3. Rocket exercised for 2 hours 27 minutes each day for 5 days. He spent an equal amount of time on lower body, upper body, and cardio. How long did he spend on cardio during the five-day period?
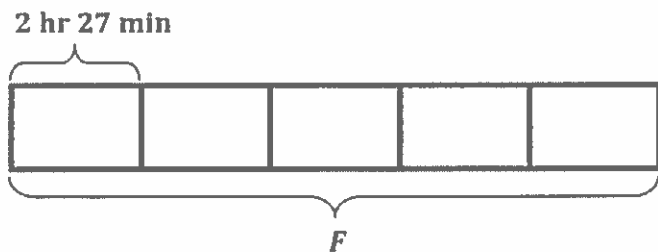
2 hr 27 min

$F = 5 \times 2 \text{ hr } 27 \text{ min}$

$= (5 \times 2 \text{ hr}) + (5 \times 27 \text{ min})$

$= 10 \text{ hr } 135 \text{ min}$

2 hr   15 min

$= 12 \text{ hr } 15 \text{ min}$
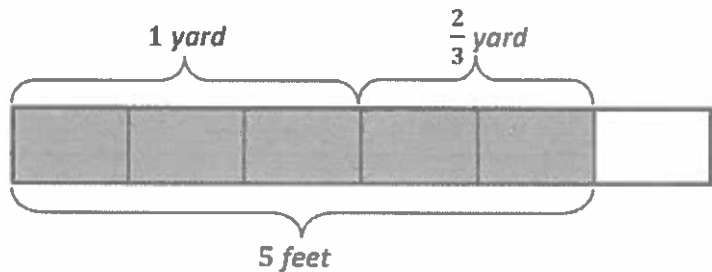
$C = (12 \text{ hr } 15 \text{ min}) \div 3$

$= (12 \text{ hr} \div 3) + (15 \text{ min} \div 3)$

$= 4 \text{ hr} + 5 \text{ min}$

$= 4 \text{ hr } 5 \text{ min}$

I find the total time that Rocket spends exercising, and then I divide each unit of time by 3.

Rocket spent 4 hours 5 minutes on cardio during the five-day period.

G4-M7-Lesson 12

1. Draw a tape diagram to show $1\frac{2}{3}$ yards = 5 feet.

1 *yard* $\frac{2}{3}$ *yard*
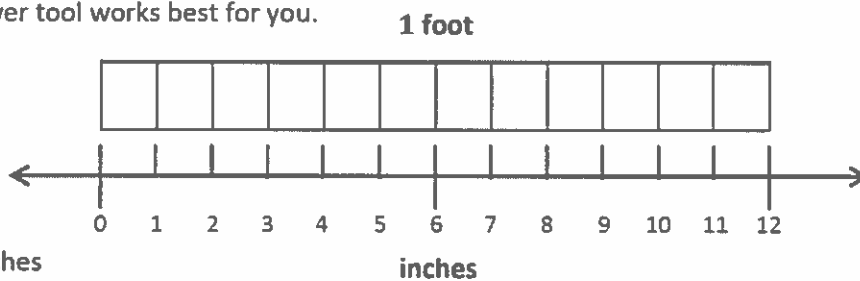
5 *feet*

> I know that 1 yard = 3 feet, so I can decompose each yard in my tape diagram into 3 feet. I can shade in $1\frac{2}{3}$ yards, and since each unit is $\frac{1}{3}$ yard, or 1 foot, I can see that $1\frac{2}{3}$ yards is equal to 5 feet.

2. Solve the problems using whatever tool works best for you.

1 foot

inches

a. $\frac{6}{12}$ foot = __6__ inches

b. $\frac{9}{12}$ foot = $\frac{3}{4}$ foot = __9__ inches

c. $\frac{8}{12}$ foot = $\frac{4}{6}$ foot = __8__ inches

> For part (a), I know that $\frac{6}{12}$ foot = $\frac{1}{2}$ foot, and I know that half a foot is 6 inches. For parts (b) and (c), I can make equivalent fractions and then find the number of inches. $\frac{3 \times 3}{4 \times 3} = \frac{9}{12}$. $\frac{9}{12}$ foot is the same as 9 inches.

Lesson 12:   Use measurement tools to convert mixed number measurements to smaller units.

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3. Solve.

a. $5\frac{1}{3}$ yd = __16__ ft

15   1
feet   foot

b. $4\frac{3}{4}$ gal = __19__ qt

16   3
quarts quarts

c. $3\frac{1}{3}$ ft = __40__ in

36   4
inches inches

1 yard = 3 feet, so 5 yards = 5×3 feet = 15 feet. And $\frac{1}{3}$ yard = 1 foot. 15 feet + 1 foot = 16 feet.

1 gallon = 4 quarts, so 4 gallons = 4×4 quarts = 16 quarts. And $\frac{1}{4}$ gallon = 1 quart, so $\frac{3}{4}$ gallon = 3 quarts. 16 quarts + 3 quarts = 19 quarts.

1 foot = 12 inches, so 3 feet = 3×12 inches = 36 inches. And $\frac{1}{12}$ foot = 1 inch, so $\frac{1}{3} = \frac{1 \times 4}{3 \times 4} = \frac{4}{12}$. $\frac{4}{12}$ foot equals 4 inches. 36 inches + 4 inches = 40 inches.

G4-M7-Lesson 13

1. Solve.
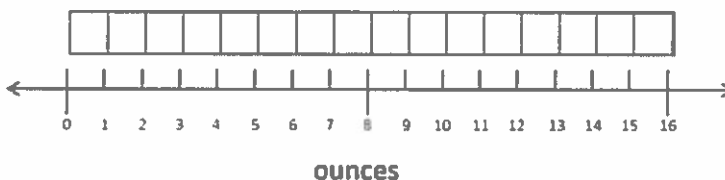
ounces

a. $\frac{2}{16}$ pound = __2__ ounces

b. $\frac{8}{16}$ pound = $\frac{2}{4}$ pound = __8__ ounces

c. $\frac{6}{16}$ pound = $\frac{3}{8}$ pound = __6__ ounces

> For part (a), I know that $\frac{1}{16}$ pound = 1 ounce, so $\frac{2}{16}$ pound = 2 ounces. For part (b), I know that $\frac{2}{4}$ pound = $\frac{1}{2}$ pound, which is equal to $\frac{8}{16}$ pound or 8 ounces. For part (c), I can make equivalent fractions. $\frac{3 \times 2}{8 \times 2} = \frac{6}{16}$. And $\frac{6}{16}$ pound = 6 ounces.
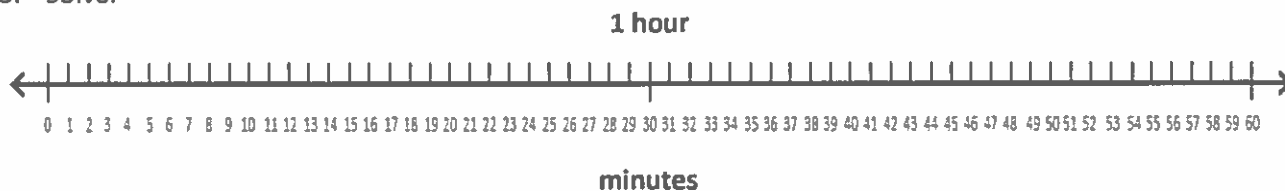
2. Draw a tape diagram to show $1\frac{1}{8}$ pounds = 18 ounces.

1 pound $\frac{1}{8}$ pound
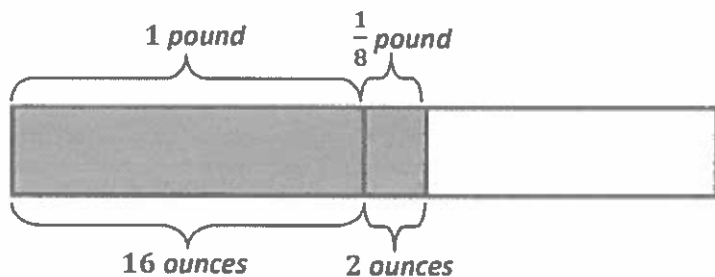
16 ounces   2 ounces

$16 \text{ ounces} + 2 \text{ ounces} = 18 \text{ ounces}$

> I can draw a tape diagram that shows $1\frac{1}{8}$ pounds. Then I can convert the pounds to ounces. 1 pound = 16 ounces. I can use an equivalent fraction to figure out how many ounces are in $\frac{1}{8}$ pound. $\frac{1 \times 2}{8 \times 2} = \frac{2}{16}$, so $\frac{1}{8}$ pound = 2 ounces.

Lesson 13: Use measurement tools to convert mixed number measurements to smaller units.

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3. Solve.

1 hour

minutes

a. $\frac{45}{60}$ hour $= \frac{3}{4}$ hour $= \underline{\quad 45 \quad}$ minutes

b. $\frac{40}{60}$ hour $= \frac{2}{3}$ hour $= \underline{\quad 40 \quad}$ minutes

For part (a), I know that $\frac{1}{4}$ hour = 15 minutes, so $\frac{3}{4}$ hour = 45 minutes $= \frac{45}{60}$ hour.

For part (b), I know that $\frac{1}{3}$ hour = 20 minutes, so $\frac{2}{3}$ hour = 40 minutes $= \frac{40}{60}$ hour.

4. Solve.

a. $3\frac{5}{8}$ pounds $= \underline{\quad 58 \quad}$ ounces	b. $4\frac{1}{4}$ lb $= \underline{\quad 68 \quad}$ oz	c. $2\frac{3}{4}$ hours $= \underline{\quad 165 \quad}$ minutes
48 oz 10 oz	64 oz 4 oz	120 min 45 min

1 pound = 16 ounces, so 3 pounds = 3 × 16 ounces = 48 ounces. And $\frac{1}{8}$ pound = 2 ounces, so $\frac{5}{8}$ pound = 10 ounces. 48 ounces + 10 ounces = 58 ounces.

4 pounds = 4 × 16 ounces = 64 ounces. And $\frac{1}{4}$ pound = 4 ounces. 64 ounces + 4 ounces = 68 ounces.

1 hour = 60 minutes, so 2 hours = 2 × 60 minutes = 120 minutes. And $\frac{1}{4}$ hour = 15 minutes, so $\frac{3}{4}$ hour = 45 minutes. 120 minutes + 45 minutes = 165 minutes.

G4-M7-Lesson 14

Use RDW to solve the following problems.

1. Doug practiced piano for 1 hour and 50 minutes on Monday. On Tuesday, he practiced piano for 25 minutes less than Monday. How many minutes did Doug practice piano on Monday and Tuesday?
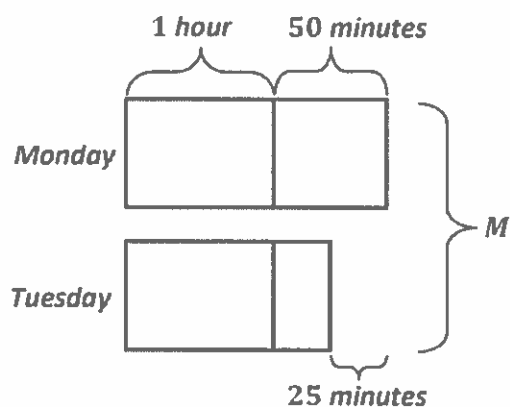
I can draw a tape diagram to represent the amount of time that Doug practiced piano each day. The tape for Monday is longer than Tuesday's because he practiced for 25 minutes less on Tuesday.

1 hour 50 minutes − 25 minutes = 1 hour 25 minutes

I subtract 25 minutes from Monday's time to figure out how long Doug practiced on Tuesday.

1 hour 50 minutes + 1 hour 25 minutes = 2 hours 75 minutes

2 hours 75 minutes = 120 minutes + 75 minutes = 195 minutes

M = 195 minutes

I add the times for Monday and Tuesday to find the total time. Then I convert the hours to minutes. 1 hour = 60 minutes, so 2 hours = 120 minutes.

Doug practiced piano for 195 minutes on Monday and Tuesday.

Lesson 14: Solve multi-step word problems involving converting mixed number measurements to a single unit.

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2. Ella can make 15 bracelets from a 105-inch piece of cord.

a. How many inches of cord would be needed to make 60 bracelets?

15 bracelets
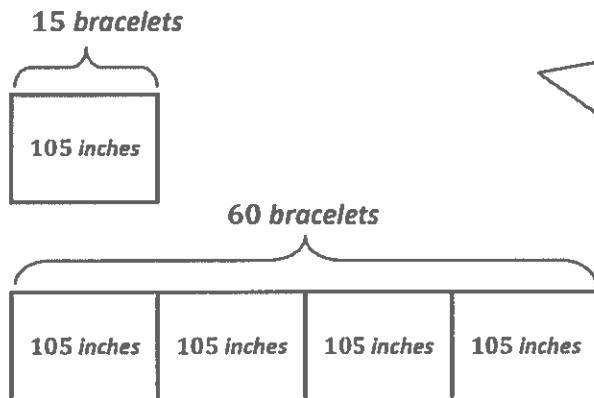
105 inches

> I can draw 1 unit of 105 inches to represent the length of cord needed to make 15 bracelets. I can draw 4 units of 105 inches to represent the length of cord needed to make 60 bracelets because $4 \times 15 = 60$.

60 bracelets

105 inches	105 inches	105 inches	105 inches

4×105 *inches* $= 420$ *inches*

$$\begin{array}{r} 1\ \ 0\ \ 5 \\ \times \quad\quad 4 \\ \hline 4\ \ 2\ \ 0 \end{array}$$

> To find the total number of inches of cord that Ella needs to make 60 bracelets, I can multiply 4×105 inches.

Ella needs 420 inches of cord to make 60 bracelets.

b. Extension: The cord Ella uses to make bracelets is also sold in $8\frac{1}{3}$-foot packages. How many packages would be needed to make 60 bracelets?
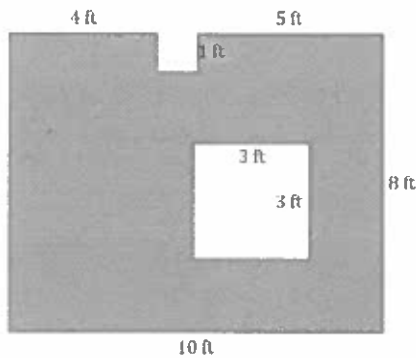
$8\frac{1}{3}$ *feet* $= 100$ *inches*

```
    96      4
 inches  inches
```
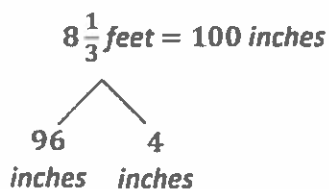
> I can covert $8\frac{1}{3}$ feet to inches. 8×12 inches $= 96$ inches and $\frac{1}{3}$ foot $= 4$ inches. 96 inches $+$ 4 inches $= 100$ inches. Ella would need to buy 5 packages because 4 packages would only be 400 inches of cord and she needs 420 inches of cord.

5×100 *inches* $= 500$ *inches*

Ella would need 5 packages to make 60 bracelets.

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Lesson 14: Solve multi-step word problems involving converting mixed number measurements to a single unit.

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G4-M7-Lesson 15

1. Find the area of the figure that is shaded.

I find the area of the white portion inside the shaded figure and the area of the cutout.

$3 \text{ ft} \times 3 \text{ ft} = 9 \text{ square ft}$

$1 \text{ ft} \times 1 \text{ ft} = 1 \text{ square ft}$

$9 \text{ square ft} + 1 \text{ square ft} = 10 \text{ square ft}$

I think of the shaded area as a rectangle without the cutouts and find its area.

$10 \text{ ft} \times 8 \text{ ft} = 80 \text{ square ft}$

$80 \text{ square ft} - 10 \text{ square ft} = 70 \text{ square ft}$

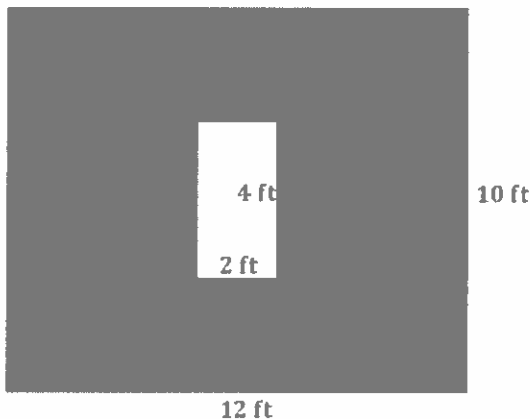I subtract the area of the cutouts from the area of the larger rectangle to find the area of the figure that is shaded.

The area of the shaded figure is 70 square feet.

2. A wall is 10 feet tall and 12 feet wide. A window with a width of 2 feet and a height of 4 feet is in the center of the wall. Find the area of the wall that can be painted.

$12 \text{ ft} \times 10 \text{ ft} = 120 \text{ square ft}$

$2 \text{ ft} \times 4 \text{ ft} = 8 \text{ square ft}$

$120 \text{ square ft} - 8 \text{ square ft} = 112 \text{ square ft}$

The area of the wall that can be painted is 112 square feet.

Lesson 15:   Create and determine the area of composite figures.   EUREKA MATH

G4-M7-Lesson 16

1. Use a ruler and protractor to create and shade a figure according to the directions:

    Draw a rectangle that is 15 centimeters long and 5 centimeters wide. Inside the rectangle, draw a smaller rectangle that is 10 centimeters long and 4 centimeters wide. Inside the smaller rectangle, draw a square that has side lengths of 2 centimeters. Shade the larger rectangle and the square.

    Find the area of the shaded space.

15 cm

10 cm

2 cm

2 cm

4 cm   **5 cm**
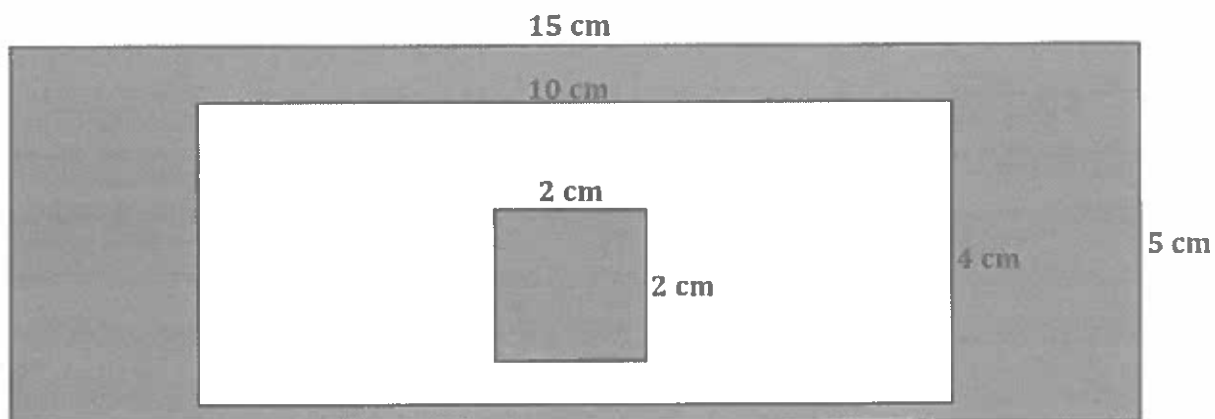
> To find the area of the shaded space, I subtract the area of the smaller, unshaded rectangle from the area of the larger, shaded rectangle, and add back the area of the square.

Large rectangle: **15 cm × 10 cm = 150 square cm**

Small rectangle: **10 cm × 4 cm = 40 square cm**

　　150 square cm − 40 square cm = 110 square cm

Square: **2 cm × 2 cm = 4 square cm**

　　110 square cm + 4 square cm = 114 square cm

The area of the shaded space is 114 square centimeters.

2. Zachary hangs a television that is 4 feet long and 2 feet wide on a wall that is 10 feet long and 8 feet tall. How much area of the wall is not covered up by the television?

10 ft

4 ft

2 ft

8 ft
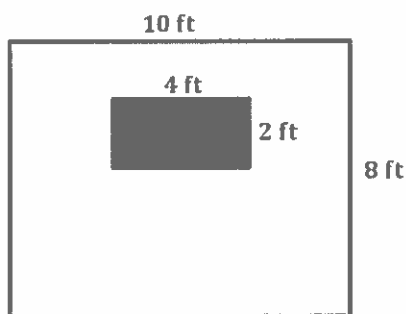
Wall: **8 ft × 10 ft = 80 square ft**

TV: **2 ft × 4 ft = 8 square ft**

80 square ft − 8 square ft = 72 square ft

72 square feet of the wall is not covered by the television.

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G4-M7-Lesson 17

1. Plot and label each point on the number line below, and complete the chart.
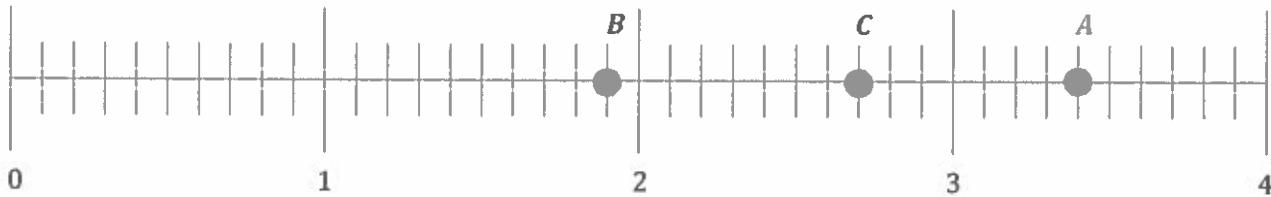
Point	Unit Form	Decimal Form	Mixed Number (ones and fraction form)	How much more to get to the next whole number?
A	3 ones 4 tenths	3.4	$3\frac{4}{10}$	0.6
B	1 *one* 9 *tenths*	1.9	$1\frac{9}{10}$	0.1
C	2 *ones* 7 *tenths*	2.7	$2\frac{7}{10}$	$\frac{3}{10}$ or 0.3

> To solve for point C, I named two and seven tenths, but I could have named any decimal that is 3 tenths from a whole number between zero and four: 0.7, 1.7, or 3.7.

2. Complete the chart.

Decimal	Mixed Number	Tenths	Hundredths
5.8	$5\frac{8}{10}$	58 *tenths or* $\frac{58}{10}$	580 *hundredths or* $\frac{580}{100}$
9.2	$9\frac{2}{10}$	92 *tenths or* $\frac{92}{10}$	920 *hundredths or* $\frac{920}{100}$

> I convert 9.2 to $9\frac{20}{100}$ to help me write the number as hundredths.

Lesson 17: Practice and solidify Grade 4 fluency.

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