

Homework Helpers

Grade 4 Module 2



G4-M2-Lesson 1

1. Find the equivalent measures.

a. $3 \text{ km} = \underline{3,000} \text{ m}$

b. $4 \text{ m} = \underline{400} \text{ cm}$

I know that 1 kilometer equals 1,000 meters.

I know that 1 meter equals 100 centimeters.

2. Find the equivalent measures.

a. $2 \text{ km } 345 \text{ m} = \underline{2,345} \text{ m}$

b. $4 \text{ m } 23 \text{ cm} = \underline{423} \text{ cm}$

c. $12 \text{ km } 45 \text{ m} = \underline{12,045} \text{ m}$

d. $24 \text{ m } 3 \text{ cm} = \underline{2,403} \text{ cm}$

I know that 12 kilometers equals 12,000 meters, so I add 12,000 meters plus 45 meters.

I know that 24 meters equals 2,400 centimeters, so I add 2,400 meters plus 3 centimeters.

3. Solve.

a. $3 \text{ m} - 42 \text{ cm}$

Sample Student A Response:

$$\begin{array}{r}
 3 \text{ m} = 300 \text{ cm} \\
 \begin{array}{r}
 2 \quad 9 \quad 10 \\
 \cancel{3} \quad \cancel{0} \quad \cancel{0} \quad \text{cm} \\
 - \quad \quad 4 \quad 2 \quad \text{cm} \\
 \hline
 2 \quad 5 \quad 8 \quad \text{cm}
 \end{array}
 \end{array}$$

Before subtracting, I make like units. 3 meters is equal to 300 centimeters.

I'll use the arrow way to add up. I add centimeters and meters that make the next whole.

Sample Student B Response:

$$\begin{array}{c}
 \textcircled{+ 8 \text{ cm}} \quad \textcircled{+ 50 \text{ cm}} \quad \textcircled{+ 2 \text{ m}} \\
 42 \text{ cm} \longrightarrow 50 \text{ cm} \longrightarrow 1 \text{ m} \longrightarrow 3 \text{ m}
 \end{array}$$

$$8 \text{ cm} + 50 \text{ cm} + 2 \text{ m} = 2 \text{ m } 58 \text{ cm}$$

I add 8 cm to make the next ten, 50 cm. I add 50 cm to make the next meter, and 1 meter is 2 meters away from 3 meters.

Now I'll add all the parts circled, finding 2 meters 58 centimeters is the difference of 3 meters and 42 centimeters.

b. $32\text{ m } 14\text{ cm} - 8\text{ m } 63\text{ cm}$

Sample Student A Response:

$$\begin{array}{r} \cancel{3}^2 \cancel{1}^1 \text{ m} \\ - ^0 ^1 \text{ m} \\ \hline 2 \text{ m} \end{array} \quad \begin{array}{r} \cancel{1}^0 \cancel{1}^1 \cancel{4}^4 \text{ cm} \\ - ^1 ^1 ^4 \text{ cm} \\ \hline 51 \text{ cm} \end{array}$$

14 cm is not enough to take away 63 cm, so I rename 1 meter as 100 cm to make 114 cm.

Sample Student B Response:

$(+ 37\text{ cm}) \quad (+ 23\text{ m}) \quad (+ 14\text{ cm})$

$8\text{ m } 63\text{ cm} \rightarrow 9\text{ m} \rightarrow 32\text{ m} \rightarrow 32\text{ m } 14\text{ cm}$

$37\text{ cm} + 23\text{ m} + 14\text{ cm} = 23\text{ m } 51\text{ cm}$

Using the arrow way, I'll add up from 8 m 63 cm until I reach 32 m 14 cm. It's almost like a number line!

c. $3\text{ km } 742\text{ m} + 9\text{ km } 473\text{ m}$

Sample Student A Response:

$$\begin{array}{r} 3 \text{ km} 742 \text{ m} \\ + 9 \text{ km} 473 \text{ m} \\ \hline 12 \text{ km} 1215 \text{ m} \end{array}$$

1,215 meters can be renamed using a number bond as 1 km 215 m.

13 km 215 m

Sample Student B Response:

$742\text{ m} + 473\text{ m}$

$700 \quad 42 \quad 300 \quad 173$

$700\text{ m} + 300\text{ m} = 1\text{ km}$

$42\text{ m} + 173\text{ m} = 215\text{ m}$

$3\text{ km} + 9\text{ km} + 1\text{ km} = 13\text{ km}$

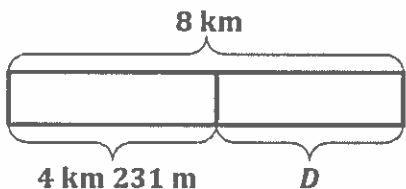
13 km 215 m

I pull out 700 m and 300 m to make 1 km.

I add the remaining meters.

Use a tape diagram to model each problem. Solve using a simplifying strategy or an algorithm, and write your answer as a statement.

4. Kya's mom drove 4 km 231 m from work to the grocery store. She drove some more miles from the grocery store to her house. If she drove a total of 8 km, how far was it from her work to her house?



I rename 8 km as 7 km 1000 m so that I have meters to subtract from.

$$\begin{array}{r} \\ - 4 \text{ km} 231 \text{ m} \\ \hline 3 \text{ km} 769 \text{ m} \end{array}$$

It is 3 km 769 m from her work to her house.

G4-M2-Lesson 2

1. Complete the conversion table.

Mass	
kg	g
3	3,000
5	5,000
7	7,000

I know that 1 kilogram equals 1,000 grams.

2. Convert the measurements.

a. $4 \text{ kg } 650 \text{ g} = \underline{4,650} \text{ g}$

b. $\underline{51} \text{ kg } \underline{45} \text{ g} = 51,045 \text{ g}$

In 51,945, there are 51 thousands 945 ones. 1 thousand grams equals 1 kilogram, so 51 thousand grams 945 grams equals 51 kilograms 945 grams.

3. Solve.

a. $7 \text{ kg} - 860 \text{ g}$

$7 \text{ kg} = 7,000 \text{ g}$

I make like units. 7 kilograms is equal to 7,000 grams.

Sample Student A Response:

$$\begin{array}{r} \\ \cancel{10} \\ 7, \text{ g} \\ - , \text{ g} \\ \hline 6, \text{ g} \end{array}$$

I subtract grams from grams.

Sample Student B Response:

$$\begin{array}{l} \textcircled{+40 \text{ g}} \quad \textcircled{+100 \text{ g}} \quad \textcircled{+6,000 \text{ g}} \\ 860 \text{ g} \longrightarrow 900 \text{ g} \longrightarrow 1,000 \text{ g} \longrightarrow 7,000 \text{ g} \\ 40 \text{ g} + 100 \text{ g} + 6,000 \text{ g} = 6,140 \text{ g} \end{array}$$

Just like in Lesson 1, I add up using the arrow way.

b. Express the answer in the smaller unit: $23 \text{ kg } 625 \text{ g} + 526 \text{ g}$.

Sample Student A Response:

$$\begin{array}{r} 23 \text{ kg} \quad 625 \text{ g} \\ + \quad \quad 526 \text{ g} \\ \hline 23 \text{ kg} \quad 1151 \text{ g} \end{array}$$

$23 \text{ kg} = 23,000 \text{ g}$

I add and then convert the answer to grams.

$23,000 \text{ g} + 1,151 \text{ g} = 24,151 \text{ g}$

Sample Student B Response:

$$\begin{array}{r} 23,625 \text{ g} \\ + \quad 526 \text{ g} \\ \hline 24,151 \text{ g} \end{array}$$

I rename 23 kg 625 grams as grams before adding.

c. Express the answer in mixed units: $18 \text{ kg } 604 \text{ g} - 3,461 \text{ g}$.

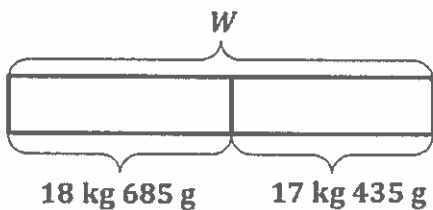
$$\begin{array}{r}
 18 \text{ kg } \overset{5}{\cancel{0}} \overset{10}{\cancel{0}} 4 \text{ g} \\
 - 3 \text{ kg } \phantom{\cancel{0} \cancel{0}} 461 \text{ g} \\
 \hline
 15 \text{ kg } \phantom{\cancel{0} \cancel{0}} 143 \text{ g}
 \end{array}$$

$$3,461 \text{ g} = 3 \text{ kg } 461 \text{ g}$$

I convert grams to kilograms before subtracting.

Use a tape diagram to model each problem. Solve using a simplifying strategy or an algorithm, and write your answer as a statement.

4. One crate of watermelon weighs 18 kilograms 685 grams. Another crate of watermelon weighs 17 kilograms 435 grams. What is their combined weight?



$$18 \text{ kg } 685 \text{ g} + 17 \text{ kg } 435 \text{ g} = W$$

$$\begin{array}{r}
 18 \text{ kg } \phantom{685 \text{ g}} \\
 + 17 \text{ kg } \phantom{435 \text{ g}} \\
 \hline
 35 \text{ kg } \phantom{1120 \text{ g}}
 \end{array}$$

$$\begin{array}{r}
 \phantom{35 \text{ kg }} 685 \text{ g} \\
 + \phantom{35 \text{ kg }} 435 \text{ g} \\
 \hline
 \phantom{35 \text{ kg }} 1120 \text{ g} \\
 \phantom{35 \text{ kg }} \swarrow \phantom{1120 \text{ g}} \\
 \phantom{35 \text{ kg }} 1,000 \text{ g} \phantom{120 \text{ g}} \\
 \phantom{35 \text{ kg }} \phantom{1,000 \text{ g}} 120 \text{ g} \\
 \phantom{35 \text{ kg }} 1 \text{ kg} \phantom{120 \text{ g}}
 \end{array}$$

I can leave my answer as 35 kg 1,120 g, but I choose to rename in largest units. 1,120 g is equal to 1 kg 120 g.

$$36 \text{ kg } 120 \text{ g}$$

The combined weight of the crates of watermelon is 36 kg 120 g.

G4-M2-Lesson 3

1. Complete the conversion table.

Liquid Capacity	
L	mL
6	6,000
18	18,000
32	32,000

There are 1,000 milliliters in 1 liter. The rule for converting is the same from Lesson 1 and 2.

2. Convert the measurements.

a. $26 \text{ L } 38 \text{ mL} = \underline{26,038} \text{ mL}$

b. $427,009 \text{ mL} = \underline{427 \text{ L } 9} \text{ mL}$

I remember doing these conversions in Lessons 1 and 2, just with different units.

3. Solve.

a. Express the answer in the smaller unit:

$32 \text{ L } 420 \text{ mL} + 685 \text{ mL}$

$$\begin{array}{r}
 32,420 \text{ mL} \\
 + \quad 685 \text{ mL} \\
 \hline
 33,105 \text{ mL}
 \end{array}$$

Before adding, I rename 32 L 420 mL as milliliters since the answer is to be in the smaller unit.

b. Express the answer in mixed units:

$62 \text{ L } 608 \text{ mL} - 35 \text{ L } 739 \text{ mL}$

$$\begin{array}{r}
 62,608 \text{ mL} \\
 - 35,739 \text{ mL} \\
 \hline
 26,869 \text{ mL}
 \end{array}$$

I can subtract mixed units as given, or I can rename the units to the smallest unit, subtract, and then rename as mixed units.

G4-M2-Lesson 4

1. Complete the table.

Smaller Unit	Larger Unit	How Many Times as Large as?
<i>ten</i>	thousand	100

I ask myself, "One thousand is 100 times as large as what unit?" I know 1 thousand is 100 tens (1×100 tens). So, my smaller unit is ten.

2. Fill in the unknown unit in word form.

125 is 1 *hundred* 25 ones.

I ask myself, "125 ones is the same as 1 of what larger unit and 25 ones?"

125 cm is 1 *meter* 25 cm.

The units are centimeters. I can make a larger unit. 100 centimeters equals 1 meter. So, 1 meter 25 cm is the same as 125 cm.

3. Write the unknown number.

 142,728 is 142 thousands 728 ones.

I can decompose 142 thousands 728 into smaller units. 142 thousands is the same as 142,000 ones. So, 142 thousands 728 ones is 142,728.

 142,728 mL is 142 L 728 mL.

I know 1 liter equals 1,000 milliliters. So, 142 liters equals 142,000 milliliters, and 142 liters 728 milliliters equals 142,728 milliliters.

4. Fill in each with
- $>$
- ,
- $<$
- , or
- $=$
- .

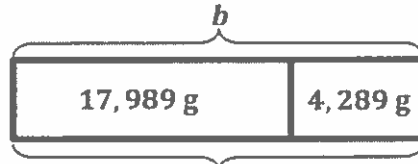
740,259 mL $>$ 74 L 249 mL

74 L 249 mL is the same as 74,249 mL. 74 ten thousands is greater than 7 ten thousands.

5. Mikal's backpack weighs 4,289 grams. Mikal weighs 17 kilograms 989 grams more than his backpack. How much do Mikal and his backpack weigh in all?

1 kg = 1,000 g

$$\begin{array}{r} 17,989 \text{ g} \\ + 4,289 \text{ g} \\ \hline 22,278 \text{ g} \end{array}$$

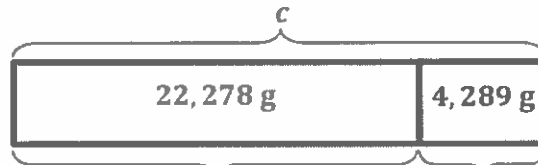


$b = 22,278 \text{ g}$

Mikal's weight

To find Mikal's weight, I add.
Mikal weighs 22,278 g.

$$\begin{array}{r} 22,278 \text{ g} \\ + 4,289 \text{ g} \\ \hline 26,567 \text{ g} \end{array}$$



$c = 26,567 \text{ g}$

Mikal

backpack

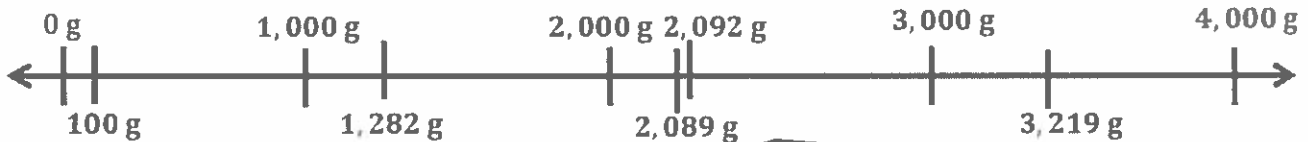
I add to find the total weight.

Altogether Mikal and his backpack weigh 26,567 g or 26 kg 567 g.

6. Place the following measurements on the number line:

1 kg 282 g 2,089 g 2 kg 92 g 3,219 g 100 g

Each unit on the number line is 1,000 g.
I label each tick mark.



I compare 2,092 and 2,089. 9 tens are more than 8 tens. So, 2,092 is more than 2,089.

G4-M2-Lesson 5

1. David weighs 46 kilograms 89 grams. Adam weighs 3,741 grams less than David. Joseph weighs 2,801 grams less than Adam. How much does Joseph weigh?

David 46,089 g

Adam a } 3,741 g

Joseph j } 2,801 g

$$a = 46,089 \text{ g} - 3,741 \text{ g}$$

$$a = 42,348 \text{ g}$$

$$\begin{array}{r} \overset{5}{\cancel{6}}, \overset{10}{\cancel{0}} \ 8 \ 9 \ \text{g} \\ - \phantom{\cancel{6}}, \phantom{\cancel{0}} \ 3 \ 7 \ 4 \ 1 \ \text{g} \\ \hline 4 \ 2, \ 3 \ 4 \ 8 \ \text{g} \end{array}$$

I don't know Adam's weight. I label this unknown with letter a . I subtract to solve for a .

$$j = 42,348 \text{ g} - 2,801 \text{ g}$$

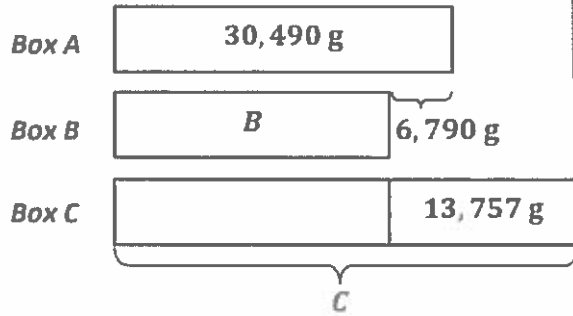
$$j = 39,547 \text{ g}$$

$$\begin{array}{r} \overset{11}{\cancel{4}} \overset{13}{\cancel{7}}, \overset{13}{\cancel{3}} \ 4 \ 8 \ \text{g} \\ - \phantom{\cancel{4}}, \phantom{\cancel{7}}, \phantom{\cancel{3}} \ 2 \ 8 \ 0 \ 1 \ \text{g} \\ \hline 3 \ 9, \ 5 \ 4 \ 7 \ \text{g} \end{array}$$

Now that I know Adam's weight, I solve for j (Joseph's weight).

Joseph weighs 39,547 grams.

2. Box A weighs 30 kilograms 490 grams. Box B weighs 6,790 grams less than Box A. Box C weighs 13 kilograms 757 grams more than Box B. What is the difference, in grams, between the weights of Box C and Box A?



I know Box B weighs 6,790 grams less than Box A. I label this part and subtract to solve for "B". Box B weighs 23,700 g.

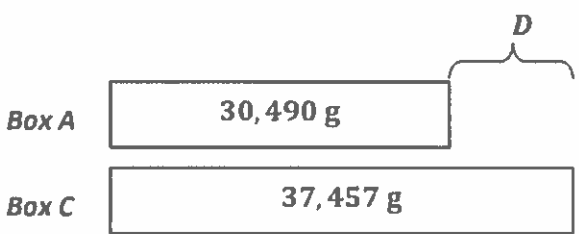
$$B = 30,490 \text{ g} - 6,790 \text{ g}$$

$$B = 23,700 \text{ g}$$

$$\begin{array}{r} 2 \quad 9 \quad 14 \\ \cancel{3} \cancel{0}, \cancel{4} \quad 9 \quad 0 \quad \text{g} \\ - \quad 6, \quad 7 \quad 9 \quad 0 \quad \text{g} \\ \hline 2 \quad 3, \quad 7 \quad 0 \quad 0 \quad \text{g} \end{array}$$

I know Box C weighs 13,757 grams more than Box B. If Box B weighs 23,700 grams, I can add to find "C". Box C weighs 37,457 g.

$$\begin{array}{r} 2 \quad 3, \quad 7 \quad 0 \quad 0 \quad \text{g} \\ + \quad 1 \quad 3, \quad 7 \quad 5 \quad 7 \quad \text{g} \\ \hline 3 \quad 7, \quad 4 \quad 5 \quad 7 \quad \text{g} \end{array}$$



I know the weights of Boxes A and C. I can subtract to find the difference, D.

$$D = 37,457 \text{ g} - 30,490 \text{ g}$$

$$D = 6,967 \text{ g}$$

$$\begin{array}{r} 13 \\ 6 \quad \cancel{7} \quad 15 \\ 3 \quad 7, \quad \cancel{4} \quad \cancel{9} \quad 7 \quad \text{g} \\ - \quad 3 \quad 0, \quad 4 \quad 9 \quad 0 \quad \text{g} \\ \hline 6, \quad 9 \quad 6 \quad 7 \quad \text{g} \end{array}$$

The difference between the weights of Box C and Box A is 6,967 g.