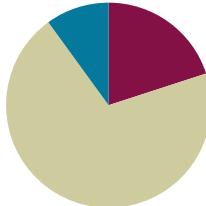


Lesson 5

Objective: Use addition and subtraction to solve multi-step word problems involving length, mass, and capacity.

Suggested Lesson Structure

Fluency Practice	(12 minutes)
Concept Development	(42 minutes)
Student Debrief	(6 minutes)
Total Time	(60 minutes)



Fluency Practice (12 minutes)

- Sprint: Convert to Kilograms and Grams **4.MD.1** (8 minutes)
- Convert Units **4.MD.1** (2 minutes)
- Unit Counting **4.MD.1** (2 minutes)

Sprint: Convert to Kilograms and Grams (8 minutes)

Materials: (S) Convert to Kilograms and Grams Sprint

Note: This Sprint helps students automatize their gram and kilogram conversions when applying them in word problems.

Convert Units (2 minutes)

Materials: (S) Personal white board

Note: Isolated review builds fluency with conversion so that students can use this skill as a tool for solving word problems.

- T: (Write $1 \text{ L } 400 \text{ mL} = \underline{\hspace{2cm}} \text{ mL}$) Fill in the equation.
 S: (Write $1 \text{ L } 400 \text{ mL} = 1,400 \text{ mL}$.)

Repeat the process for $1 \text{ L } 40 \text{ mL}$, $1 \text{ L } 4 \text{ mL}$, and $1 \text{ L } 90 \text{ mL}$.

NOTES ON STANDARDS ALIGNMENT:

In Module 2, students convert metric length, mass, and capacity units to add and subtract mixed units. This lesson builds on the content of **2.MD.5** and **3.MD.2**.

Occasionally, students work beyond the **4.MD.1** and **4.MD.2** standards by converting from a smaller unit to a larger unit. They do this by connecting metric units to place value units.

Develop students' basic number sense to make these conversions, and always accept answers in the smaller unit.

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Some of the objectives of the Sprint are to generate excitement about math, to cultivate self-determination and perseverance, and to offer joyful experiences of success in math. The first weeks of school are an appropriate time to involve students in the design of their Sprint experience. Guide students through discussion to make optimal decisions about tools and supports that can be used, the sequence or timing for completion, and the type of reward and recognition for success and improvement.

Unit Counting (2 minutes)

Note: This fluency activity deepens student understanding of the composition and decomposition of unit conversions and works towards their mastery of adding and subtracting meters and centimeters. The numbers in bold type indicate the point at which the direction of the counting changes.

Direct students to count by centimeters using the following sequence:

- 800 cm, 1,600 cm, 2,400 cm, 3,200 cm, 4,000 cm, **3,200 cm**, 2,400 cm, 1,600 cm, 800 cm
- 800 cm, 1,600 cm, 2,400 cm, 3,200 cm, 4 m, **3,200 cm**, 2,400 cm, 1,600 cm, 800 cm
- 800 cm, 1 m 600 cm, 2 m 400 cm, 3 m 200 cm, 4 m, **3 m 200 cm**, 2 m 400 cm, 1 m 600 cm, 800 cm

Concept Development (42 minutes)

Materials: (S) Problem Set

Note: In this lesson, the Problem Set is comprised of the word problems from the lesson and used during the lesson itself for Problems 1–4. Problems 5 and 6 should be completed independently at the conclusion of the Concept Development. The lesson concludes with the Debrief.

1. Model the problem.

Have two pairs of students who can successfully modeling the problem work at the board while the others work independently or in pairs at their seats. Review the following questions before beginning the first problem.

- Can you draw something?
- What can you draw?
- What conclusions can you make from your drawing?

As students work, circulate. Reiterate the questions above.

After two minutes, have the two pairs of students share *only* their labeled diagrams.

For about one minute, have the demonstrating students receive and respond to feedback and questions from their peers.

2. Calculate to solve and write a statement.

Give everyone two minutes to finish work on that problem, sharing their work and thinking with a peer. All should then write their equations and statements of the answer.

3. Assess the solution for reasonableness.

Give students one to two minutes to assess and explain the reasonableness of their solution.

Problem 1: Solve a two-step problem involving grams.

The potatoes Beth bought weighed 3 kilograms 420 grams. Her onions weighed 1,050 grams less than the potatoes. How much did the potatoes and onions weigh together?

Solution 1

$$\begin{array}{r} \text{Potatoes} \boxed{3 \text{ kg } 420 \text{ g}} \\ \text{Onions} \boxed{\checkmark \quad 1,050 \text{ g}} \\ \hline \end{array} \quad \left. \begin{array}{r} W \\ - 1,050 \text{ g} \\ \hline 2 \text{ kg } 370 \text{ g} \end{array} \right\}$$

$$\begin{array}{r} 3 \text{ kg } 420 \text{ g} \\ + 2 \text{ kg } 370 \text{ g} \\ \hline 5 \text{ kg } 790 \text{ g} \end{array}$$

The potatoes and onions weigh 5 kg 790 g.

Solution 2

$$\begin{array}{r} P \boxed{3 \text{ kg } 420 \text{ g}} \\ O \boxed{1,050 \text{ g}} \\ \hline ? \end{array}$$

$$3420 - 1050 = 2370$$

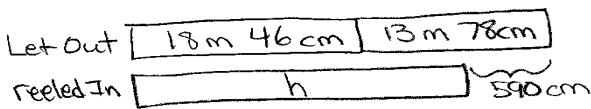
$$\begin{array}{r} 2370 \\ + 3420 \\ \hline 5790 \end{array}$$

The potatoes and onions weighed 5 kg 790 g.

The structure of this problem and what it demands of the students is similar to that found within Module 1. Therefore, students are familiar with the process of a two-step problem. The main differences within this problem are that the focus is on mass and that students are computing with mixed units. Lessons 1–4 have prepared the students for mixed unit calculations and conversions. Answering in mixed units or as a single unit of grams should be accepted. Watch for students using alternate strategies as well.

Problem 2: Solve a two-step problem involving meters.

Adele let out 18 meters 46 centimeters of string to fly her kite. She then let out 13 meters 78 centimeters more before reeling back in 590 centimeters. How long was her string after reeling it in?

Solution 1

$$\begin{array}{r}
 18 \text{ m } 46 \text{ cm} \\
 + 13 \text{ m } 78 \text{ cm} \\
 \hline
 31 \text{ m } 124 \text{ cm}
 \end{array}$$

~~31 m 124 cm~~

~~1m 24cm = 32m 24cm~~

~~32 m 24 cm = 3,224 cm~~

~~24 cm~~

~~3,224 cm~~

~~- 590 cm~~

~~2,634 cm~~

$$\begin{array}{r}
 2,634 \text{ cm} \\
 / \quad \backslash \\
 26 \text{ m } 34 \text{ cm}
 \end{array}$$

The string was 26 m 34 cm
after reeling it in.

Solution 2

$$\begin{aligned}
 & 18 \text{ m } 46 \text{ cm} + 13 \text{ m } 78 \text{ cm} \\
 &= 31 \text{ m } 46 \text{ cm} + 78 \text{ cm} \\
 &\quad \swarrow \quad \searrow \\
 &\quad 30 \quad 16 \quad 70 \quad 8 \\
 &= 31 \text{ m } 124 \text{ cm} \\
 &= 32 \text{ m } 24 \text{ cm}
 \end{aligned}$$

$$\begin{array}{r}
 32 \text{ m } 24 - 590 \text{ cm} \\
 3224 - 590 \text{ cm} \\
 \hline
 2224 \quad \cancel{+ 000} \\
 \hline
 2224 + 410 = 2634
 \end{array}$$

The string was 26 m 34 cm.

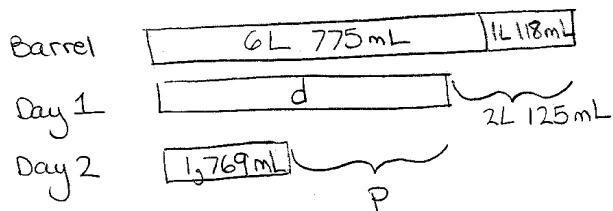
This two-step problem requires regrouping from meters to centimeters. As in the previous problem, students use what they have learned so far in Grade 4 to help solve this problem. Students might regroup across mixed units or change to similar units. In the second solution, the student adds the meters first, then the centimeters, and finally subtracts 590 centimeters from the total.

Problem 3

Solve a three-step problem involving liters.

Shyan's barrel contained 6 liters 775 milliliters of paint. She poured in 1 liter 118 milliliters more. The first day Shyan used 2 liters 125 milliliters of the paint. After the second day, there were 1,769 milliliters of paint remaining in the barrel. How much paint did Shyan use on the second day?

Solution 1



$$\begin{array}{r}
 6 \text{ L} & 775 \text{ mL} \\
 + 1 \text{ L} & 118 \text{ mL} \\
 \hline
 7 \text{ L} & 893 \text{ mL}
 \end{array}
 \quad
 \begin{array}{r}
 7 \text{ L} & 8\cancel{7}^{\text{13}} \text{ mL} \\
 - 2 \text{ L} & 125 \text{ mL} \\
 \hline
 5 \text{ L} & 768 \text{ mL}
 \end{array}
 = 5,768 \text{ mL}$$

Shyan used 3,999 mL of paint on the second day.

Solution 2

$$\begin{array}{r} 6775 - 2125 = 4650 \\ 4650 + 1118 = 5768 \\ 5768 - 1769 = 3999 \end{array}$$

$\swarrow \searrow$

3768 2000 231 Shyan used 3 L 999 mL on the
second day.

This is a three-step problem involving regrouping across units. Students are familiar with multi-step problems from Module 1 and extend their practice with them by solving with mixed units or by converting to milliliters prior to solving. In the second solution, the student sees that it is easy to subtract 2,125 from 6,775 first, then adds the amount Adele poured in, and finally finishes the problem in the same way as shown in Solution 1, by subtracting the part left in the barrel.

Problem 4: Solve a three-step problem involving grams.

On Thursday, the pizzeria used 2 kilograms 180 grams less flour than they used on Friday. On Friday, they used 12 kilograms 240 grams. On Saturday, they used 1,888 grams more than on Friday. What was the total amount of flour used over the three days?

Solution 1

The diagram shows three horizontal bars representing flour usage:

- Thurs.**: A bar labeled "W" above it, with a bracket below it labeled "2kg 180g".
- Fri.**: A bar labeled "12 kg 240 g".
- Sat.**: A bar labeled "12 kg 240 g" followed by "1,888g".

To the right, there is a subtraction calculation:

$$\begin{array}{r} 12 \text{ kg } 240 \text{ g } \\ - 2 \text{ kg } 180 \text{ g } \\ \hline \text{Thurs. } 10 \text{ kg } 60 \text{ g } \end{array}$$

Below this, the total for Friday and Saturday is calculated:

$$\begin{array}{r} 12 \text{ kg } 240 \text{ g } \\ + 1,888 \text{ g } \\ \hline \text{Sat. } 14,128 \text{ g } \end{array}$$

Finally, the total for all three days is calculated:

$$\begin{array}{r} 10,060 \text{ g } \\ 12,240 \text{ g } \\ 14,128 \text{ g } \\ \hline 36,428 \text{ g } \\ | \\ 36 \text{ kg } 428 \text{ g } \end{array}$$

The handwritten note states: "The total amount of flour was 36 kg 428g."

Solution 2

$$3 \text{ units of } 12 \text{ kg } 240 \text{ g } = 36 \text{ kg } 720 \text{ g}$$

$$2 \text{ kg } 180 \text{ g } - 1 \text{ kg } 888 = 292 \text{ g}$$

$$\begin{array}{r} 1 \text{ kg } 1000 \text{ g } \\ \swarrow \searrow \\ 1 \text{ kg } 112 \text{ g } \end{array}$$

$$36 \text{ kg } 720 \text{ g } - 292 \text{ g } = 36 \text{ kg } 428 \text{ g}$$

$$\begin{array}{r} 720 \\ \swarrow \searrow \\ 420 \ 300 \ 8 \end{array}$$

The bakery used 36 kg 428g.

This three-step problem increases the complexity in that students might calculate, as in the first solution, for the three addends to complete the third step for determining how much flour was used over the three days. In the second solution strategy, the student, because of the tape diagram, notices 3 units of Friday minus the difference between the two small chunks. The answer will be a little less than three Fridays' worth of flour.

MP.7

Problem Set (10 minutes)

Please note that Problems 1 through 4 of the Problem Set for this lesson are comprised of the lesson's problems as stated at the introduction of the lesson. Problems 5 and 6 may be completed individually during this point of the lesson.

For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students should solve these problems using the RDW approach used for Application Problems.

Student Debrief (6 minutes)

Lesson Objective: Use addition and subtraction to solve multi-step word problems involving length, mass, and capacity.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

You may choose to use any combination of the questions below to lead the discussion.

- How was the work completed to solve Problem 5 in the Problem Set different than the other problems?
- Did you find yourself using similar strategies to add and to subtract the mixed unit problems? Explain.
- How can drawing different models to represent a problem lead you to a correct answer?
- How was drawing a model helpful in organizing your thoughts to solve Problem 6?
- Describe a mixed unit. What other mixed units can you name?
- How can converting to a smaller unit be useful when solving problems? When is it not useful?

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Sustain engagement during this challenging lesson by guiding and rewarding responsible collaboration among students. Teach students to independently ask themselves, "Can I draw something? What can I draw? What conclusions can I make from my drawing?" Empower students to self-monitor their math work with a rubric for problem solving. Students working below or above grade level may want to omit drawing. Emphasize the value of modeling. Ask, "How did the picture help you solve? What happened when you did not draw the picture? Why?"

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 5 Problem Set 4•2

Name Jack Date _____

Directions: Model each problem with a tape diagram. Solve and answer with a statement.

1. The potatoes Beth bought weighed 3 kilograms 420 grams. Her onions weighed 1,050 grams less than the potatoes. How much did the potatoes and onions weigh together?

$$\begin{array}{r} \text{potatoes } 3\text{ kg } 420\text{ g} \\ \text{onions } \boxed{\checkmark} \quad 1,050\text{ g} \\ \hline \end{array}$$

$$\begin{array}{r} 3\text{ kg } 420\text{ g} \\ - 1,050\text{ g} \\ \hline 2\text{ kg } 370\text{ g } (\text{onions}) \end{array}$$

$$\begin{array}{r} 3\text{ kg } 420\text{ g} \\ + 2\text{ kg } 370\text{ g} \\ \hline 5\text{ kg } 790\text{ g} \end{array}$$

The potatoes and onions together weigh 5 kg 790 g.

2. Adele let out 18 meters 46 centimeters of string to fly her kite. She then let out 13 meters 78 centimeters more before reeling back in 590 centimeters. How long was her string after reeling it in?

$$\begin{array}{r} \text{let out } 18\text{ m } 46\text{ cm} \\ \text{after } \boxed{\checkmark} \\ \text{reeling in } \boxed{h} \quad 590\text{ cm} \\ \hline \end{array}$$

$$\begin{array}{r} 18\text{ m } 46\text{ cm} \\ + 13\text{ m } 78\text{ cm} \\ \hline 31\text{ m } 12\text{ cm} \end{array}$$

$$\begin{array}{r} 31\text{ m } 12\text{ cm} \\ - 590\text{ cm} \\ \hline 1\text{ m } 24\text{ cm} \end{array}$$

$$\begin{array}{r} 32\text{ m } 24\text{ cm} = 3,224\text{ cm} \\ 23\text{ m } 14\text{ cm} \\ - 23\text{ m } 99\text{ cm} \\ \hline 2,634\text{ cm} \end{array}$$

$$\begin{array}{r} 2,634\text{ cm} \\ - 26\text{ m } 84\text{ cm} \\ \hline 26\text{ m } 34\text{ cm} \end{array}$$

The string was 26 m 34 cm after reeling it in.

3. Shyan's barrel contained 6 liters 775 milliliters of paint. She poured in 1 liter 118 milliliters more. The first day Shyan used 2 liters 125 milliliters of the paint. At the end of the second day, there were 1,769 milliliters of paint remaining in the barrel. How much paint did Shyan use on the second day?

$$\begin{array}{r} \text{Barrel } 6\text{ L } 775\text{ mL } \boxed{d} \\ \text{After day 1 } \boxed{1} \quad 2\text{ L } 125\text{ mL} \\ \text{After day 2 } \boxed{1,769\text{ mL}} \quad \boxed{p} \\ \hline \end{array}$$

$$\begin{array}{r} 6\text{ L } 775\text{ mL} \\ + 1\text{ L } 118\text{ mL} \\ \hline 7\text{ L } 893\text{ mL} \end{array}$$

$$\begin{array}{r} 7\text{ L } 893\text{ mL} \\ - 2\text{ L } 125\text{ mL} \\ \hline 5\text{ L } 768\text{ mL} = 5,768\text{ mL} \end{array}$$

$$\begin{array}{r} 5,768\text{ mL} \\ - 1,769\text{ mL} \\ \hline 3,999\text{ mL} \end{array}$$

Shyan used 3,999 mL of paint on the second day.

COMMON CORE Lesson 5: Use addition and subtraction to solve multi-step word problems involving length, mass, and capacity. Date: 3/1/14 © 2013 Common Core, Inc. Some rights reserved. commoncore.org This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License. engage^{ny} 2.B.27

- How is regrouping a mixed unit of measurement similar to regrouping a whole number when adding or subtracting?
- How is converting mixed units of measurement useful in everyday situations?

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students' understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 5 Problem Set 4•2

4. On Thursday, the pizzeria used 2 kilograms 180 grams less flour than they used on Friday. On Friday, they used 12 kilograms 240 grams. On Saturday, they used 1,888 grams more than on Friday. What was the total amount of flour used over the three days?

$$\begin{array}{r} 12 \text{ kg } 240 \text{ g} \\ - 2 \text{ kg } 180 \text{ g} \\ \hline 10 \text{ kg } 60 \text{ g} \end{array}$$
 (Thursday)
$$\begin{array}{r} 10 \text{ kg } 60 \text{ g} \\ + 1,888 \text{ g} \\ \hline 12 \text{ kg } 240 \text{ g} \end{array}$$
 (Saturday)

The total amount of flour used over the three days was 36 kg 428 g.

5. The gas tank in Zachary's car has a capacity of 60 liters. He adds 23 liters 825 milliliters gas to the tank, which already has 2,050 milliliters of gas. How much more gas can Zachary add to the gas tank?

$$\begin{array}{r} 2,050 \text{ mL} \\ + 23,825 \text{ mL} \\ \hline 25,875 \text{ mL} \end{array}$$

Zachary can add 34,125 mL more gas to his car.

6. A giraffe is 5 meters 20 centimeters tall. An elephant is 1 meter 77 centimeters shorter than the giraffe. A rhinoceros is 1 meter 58 centimeters shorter than the elephant. How tall is the rhinoceros?

$$\begin{array}{r} 5 \text{ m } 20 \text{ cm} \\ - 1 \text{ m } 77 \text{ cm} \\ \hline 3 \text{ m } 43 \text{ cm} \end{array}$$

$$\begin{array}{r} 3 \text{ m } 43 \text{ cm} \\ - 1 \text{ m } 58 \text{ cm} \\ \hline 1 \text{ m } 85 \text{ cm} \end{array}$$

The rhinoceros was 1 meter 85 centimeters tall.

COMMON CORE LESSON 5 Date: 3/1/14 Use addition and subtraction to solve multi-step word problems involving length, mass, and capacity. © 2013 Common Core, Inc. Some rights reserved. commoncore.org engageNY 2.B.2B This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

A

Correct _____

Write in kilograms and grams.

1	$2,000 \text{ g} =$	kg	g	23	$3,800 \text{ g} =$	kg	g
2	$3,000 \text{ g} =$	kg	g	24	$4,770 \text{ g} =$	kg	g
3	$4,000 \text{ g} =$	kg	g	25	$4,807 \text{ g} =$	kg	g
4	$9,000 \text{ g} =$	kg	g	26	$5,065 \text{ g} =$	kg	g
5	$6,000 \text{ g} =$	kg	g	27	$5,040 \text{ g} =$	kg	g
6	$1,000 \text{ g} =$	kg	g	28	$6,007 \text{ g} =$	kg	g
7	$8,000 \text{ g} =$	kg	g	29	$2,003 \text{ g} =$	kg	g
8	$5,000 \text{ g} =$	kg	g	30	$1,090 \text{ g} =$	kg	g
9	$7,000 \text{ g} =$	kg	g	31	$1,055 \text{ g} =$	kg	g
10	$6,100 \text{ g} =$	kg	g	32	$9,404 \text{ g} =$	kg	g
11	$6,110 \text{ g} =$	kg	g	33	$9,330 \text{ g} =$	kg	g
12	$6,101 \text{ g} =$	kg	g	34	$3,400 \text{ g} =$	kg	g
13	$6,010 \text{ g} =$	kg	g	35	$4,000 \text{ g} + 2,000 \text{ g} =$	kg	g
14	$6,011 \text{ g} =$	kg	g	36	$5,000 \text{ g} + 3,000 \text{ g} =$	kg	g
15	$6,001 \text{ g} =$	kg	g	37	$4,000 \text{ g} + 4,000 \text{ g} =$	kg	g
16	$8,002 \text{ g} =$	kg	g	38	$8 \times 7,000 \text{ g} =$	kg	g
17	$8,020 \text{ g} =$	kg	g	39	$49,000 \text{ g} \div 7 =$	kg	g
18	$8,200 \text{ g} =$	kg	g	40	$16,000 \text{ g} \times 5 =$	kg	g
19	$8,022 \text{ g} =$	kg	g	41	$63,000 \text{ g} \div 7 =$	kg	g
20	$8,220 \text{ g} =$	kg	g	42	$17 \times 4,000 \text{ g} =$	kg	g
21	$8,222 \text{ g} =$	kg	g	43	$13,000 \text{ g} \times 5 =$	kg	g
22	$7,256 \text{ g} =$	kg	g	44	$84,000 \text{ g} \div 7 =$	kg	g

B

Improvement _____

Correct _____

Write in kilograms and grams.

1	$1,000 \text{ g} =$	kg	g	23	$2,700 \text{ g} =$	kg	g
2	$2,000 \text{ g} =$	kg	g	24	$3,660 \text{ g} =$	kg	g
3	$3,000 \text{ g} =$	kg	g	25	$3,706 \text{ g} =$	kg	g
4	$8,000 \text{ g} =$	kg	g	26	$4,095 \text{ g} =$	kg	g
5	$6,000 \text{ g} =$	kg	g	27	$4,030 \text{ g} =$	kg	g
6	$9,000 \text{ g} =$	kg	g	28	$5,006 \text{ g} =$	kg	g
7	$4,000 \text{ g} =$	kg	g	29	$3,004 \text{ g} =$	kg	g
8	$7,000 \text{ g} =$	kg	g	30	$2,010 \text{ g} =$	kg	g
9	$5,000 \text{ g} =$	kg	g	31	$2,075 \text{ g} =$	kg	g
10	$5,100 \text{ g} =$	kg	g	32	$1,504 \text{ g} =$	kg	g
11	$5,110 \text{ g} =$	kg	g	33	$1,440 \text{ g} =$	kg	g
12	$5,101 \text{ g} =$	kg	g	34	$4,500 \text{ g} =$	kg	g
13	$5,010 \text{ g} =$	kg	g	35	$3,000 \text{ g} + 2,000 \text{ g} =$	kg	g
14	$5,011 \text{ g} =$	kg	g	36	$4,000 \text{ g} + 3,000 \text{ g} =$	kg	g
15	$5,001 \text{ g} =$	kg	g	37	$5,000 \text{ g} + 4,000 \text{ g} =$	kg	g
16	$7,002 \text{ g} =$	kg	g	38	$9 \times 8,000 \text{ g} =$	kg	g
17	$7,020 \text{ g} =$	kg	g	39	$64,000 \text{ g} \div 8 =$	kg	g
18	$7,200 \text{ g} =$	kg	g	40	$17,000 \text{ g} \times 5 =$	kg	g
19	$7,022 \text{ g} =$	kg	g	41	$54,000 \text{ g} \div 6 =$	kg	g
20	$7,220 \text{ g} =$	kg	g	42	$18,000 \text{ g} \times 4 =$	kg	g
21	$7,222 \text{ g} =$	kg	g	43	$14 \times 5,000 \text{ g} =$	kg	g
22	$4,378 \text{ g} =$	kg	g	44	$96,000 \text{ g} \div 8 =$	kg	g

Name _____ Date _____

Model each problem with a tape diagram. Solve and answer with a statement.

1. The potatoes Beth bought weighed 3 kilograms 420 grams. Her onions weighed 1,050 grams less than the potatoes. How much did the potatoes and onions weigh together?



2. Adele let out 18 meters 46 centimeters of string to fly her kite. She then let out 13 meters 78 centimeters more before reeling back in 590 centimeters. How long was her string after reeling it in?



3. Shyan's barrel contained 6 liters 775 milliliters of paint. She poured in 1 liter 118 milliliters more. The first day Shyan used 2 liters 125 milliliters of the paint. At the end of the second day, there were 1,769 milliliters of paint remaining in the barrel. How much paint did Shyan use on the second day?

4. On Thursday, the pizzeria used 2 kilograms 180 grams less flour than they used on Friday. On Friday, they used 12 kilograms 240 grams. On Saturday, they used 1,888 grams more than on Friday. What was the total amount of flour used over the three days?



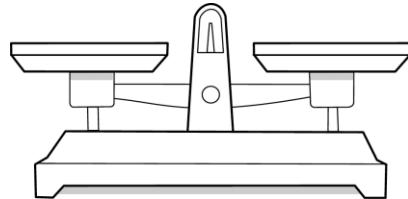
5. The gas tank in Zachary's car has a capacity of 60 liters. He adds 23 liters 825 milliliters gas to the tank, which already has 2,050 milliliters of gas. How much more gas can Zachary add to the gas tank?

6. A giraffe is 5 meters 20 centimeters tall. An elephant is 1 meter 77 centimeters shorter than the giraffe. A rhinoceros is 1 meter 58 centimeters shorter than the elephant. How tall is the rhinoceros?

Name _____ Date _____

Model each problem with a tape diagram. Solve and answer with a statement.

- Jeff places a pineapple with a mass of 890 grams on a balance scale. He balances the scale by placing two oranges, an apple, and a lemon on the other side. Each orange weighs 280 grams. The lemon weighs 195 grams less than each orange. What is the mass of the apple?



- Brian is 1 meter 87 centimeters tall. Bonnie is 58 centimeters shorter than Brian. Betina is 26 centimeters taller than Bonnie. How tall is Betina?

Name _____ Date _____

Date _____

Model each problem with a tape diagram. Solve and answer with a statement.

1. The capacity of Jose's vase is 2,419 milliliters of water. He poured 1 liter 299 milliliters of water into the empty vase. Then, he added 398 milliliters. How much more water will the vase hold?
 2. Eric biked 1 kilometer 125 meters on Monday. On Tuesday, he biked 375 meters less than on Monday. How far did he bike both days?
 3. Zachary weighs 37 kilograms 95 grams. Gabe weighs 4,650 grams less than Zachary. Harry weighs 2,905 grams less than Gabe. How much does Harry weigh?

4. A Springer Spaniel weighs 20 kilograms 490 grams. A Cocker Spaniel weighs 7,590 grams less than a Springer Spaniel. A Newfoundland weighs 52 kilograms 656 grams more than a Cocker Spaniel. What is the difference, in grams, between the weights of the Newfoundland and the Springer Spaniel?
5. Marsha has three rugs. The first rug is 2 meters 87 centimeters long. The second rug has a length 98 centimeters less than the first. The third rug is 111 centimeters longer than the second rug. What is the difference in centimeters between the length of the first rug and third rug?
6. One barrel held 60 liters 868 milliliters of sap. A second barrel held 20,089 milliliters more sap than the first. A third barrel held 40 liters 82 milliliters less sap than the second. If the sap from the three barrels was poured into a larger container, how much sap would there be in all?