



# MATH NEWS



LAFAYETTE  
PARISH SCHOOL SYSTEM

Grade 3, Module 2, Topic A

October 2013

## 3<sup>rd</sup> Grade Math

*Module 2: Place Value and Problem Solving with Units of Measure*

### Math Parent Letter

This document is created to give parents and students a better understanding of the math concepts found in Eureka Math (© 2013 Common Core, Inc.) that is also posted as the Engage New York material which is taught in the classroom. Module 2 of Eureka Math (Engage New York) covers Place Value and Problem-Solving with Units of Measure. This newsletter will discuss Module 2, Topic A.

Topic A. Time Measurement and Problem Solving

### Vocabulary Words

- Seconds
- Minutes
- Continuous
- Analog Clock
- Intervals
- Halfway
- Number line
- Plot (plotting)
- Point

### Things to Remember!!!

When drawing the hands on a clock, the minute hand must be longer than the hour hand. When reading a clock and looking at the hour hand the hour will always be the number that the hour hand has passed or is directly on.

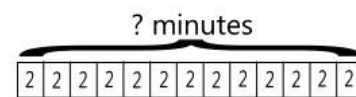
## OBJECTIVE OF TOPIC A

- 1 Explore time as a continuous measurement using a stopwatch.
- 2 Relate skip-counting by 5 on the clock and telling time to a continuous measurement model, the number line.
- 3 Count by five and one on the number line as a strategy to tell time to the nearest minute on the clock.  
Solve word problems involving time intervals within 1
- 4 hour by counting backwards and forwards using a number line and clock.
- 5 Solve word problems involving time intervals within an hour by adding and subtracting on the number line.

## Focus Area- Topic A

*Time Measurement and Problem Solving*

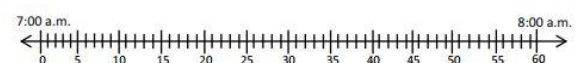
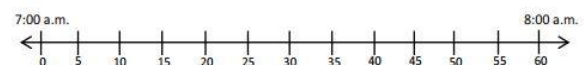
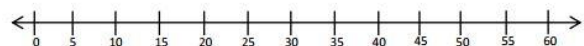
*Stacy has 13 math problems on her test. It takes her 2 minutes to complete each problem. How many minutes does it take Stacy to finish all 13 problems?*



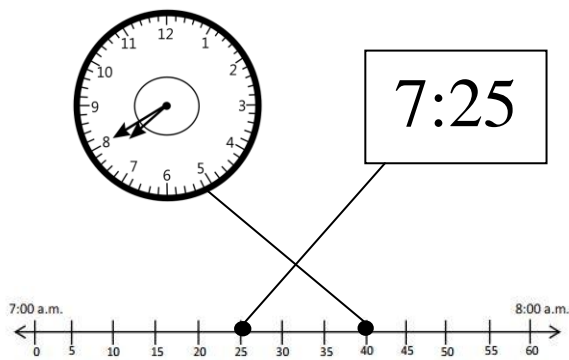
$$13 \times 2 = 26 \text{ minutes}$$

It takes Stacy 26 minutes to finish her test.

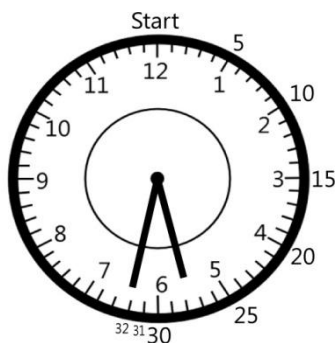
*In Lesson 2, students use a number line to understand that time is a continuous unit of measurement. Students apply what they learn about skip-counting by fives to telling time on a number line. They learn how to read/draw a number line with hours as endpoints and minutes in multiples of five. In Lesson 3, students begin to use a number line that is divided into one-minute intervals.*



Plot a point on the number line for the time shown on the clock below. Draw a line to match the clock to the points.

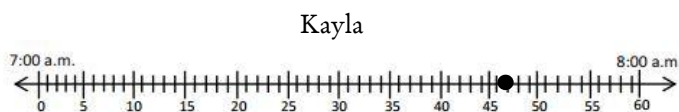


Skip count, then count on...

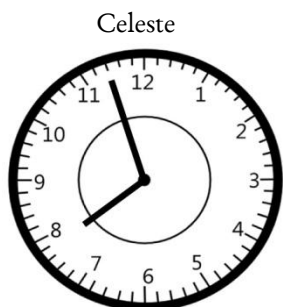


5, 10, 15, 20, 25, 30, 31, 32 so the time is 5:32

Kayla and Celeste started walking at 7:00 a.m. The clock and the number line show the times that Kayla and Celeste stopped walking. Who finished first? How do you know?



Kayla



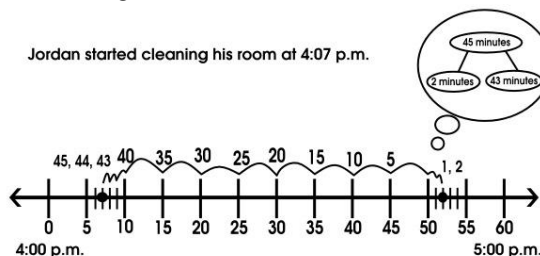
Kayla: 7:47  
Celeste: 7:57  
Kayla finished walking first because 7:47 comes before 7:57. I know this because I pictured Kayla's time on the clock that shows Celeste's time.

Students will begin to draw number lines used to represent time while learning about this topic.

**Start Unknown Problem** – End time and minutes elapsed known, start time unknown.

Jordan cleans his room for 45 minutes. He finished cleaning his room at 4:52 p.m. What time did Jordan start cleaning his room?

Jordan started cleaning his room at 4:07 p.m.

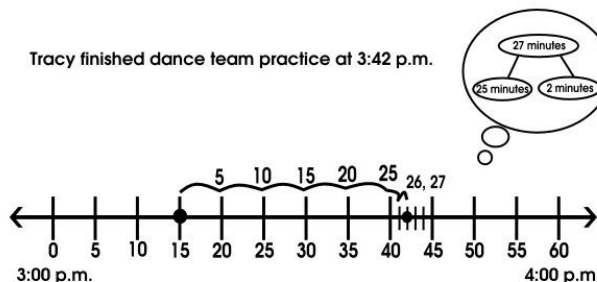


We need to count back 45 minutes, so we count 2, then 40, then 3 more.

**Result Unknown Problem** – Start time and minutes elapsed known, end time unknown.

Tracy starts dance team practice at 3:15 p.m. She practices for 27 minutes. What time does dance practice end?

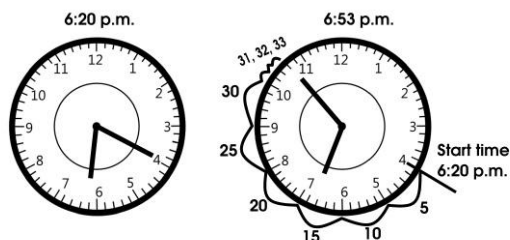
Tracy finished dance team practice at 3:42 p.m.



We need to count 27 minutes, so we skip-count to 25 and then add on 26, 27.

**Change Unknown Problem** - Start time and end time known, elapsed time unknown.

Jo-Ann started running at 6:20 p.m. and stopped running at 6:53 p.m. How many minutes did Jo-Ann run?



Jo-Ann ran for 33 minutes.

We need to begin counting at 6:20 p.m. and stop counting at 6:53 p.m., so we count 5, 10, 15, 20, 25, 30, 31, 32, 33.



# MATH NEWS



LAFAYETTE  
PARISH SCHOOL SYSTEM

Grade 3, Module 2, Topic B

October 2013

## 3<sup>rd</sup> Grade Math

*Module 2: Place Value and Problem Solving with Units of Measure*

### Math Parent Letter

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Topic B. Measuring Weight and Liquid Volume in Metric Units

### Vocabulary Words

- Gram (g)
- Kilogram (kg)
- Weight
- Scale
- Halfway
- ≈ Approximate
- Liter (L)
- Milliliter (mL)
- Estimate
- Capacity
- Liquid Volume
- Beakers

### Helpful Hints!!!

In previous units we studied about a place value chart. The tens place is the same as 10 ones, the hundreds place is the same as 10 tens, the thousands place is the same as 10 hundreds.

Thousands	Hundreds	Tens	Ones
-----------	----------	------	------

Weight can relate to a place value because 10 g is equal to ten 1 grams, 100 g is equal to ten 10 grams, and 1 kg is equal to 1,000 grams which is ten 100 grams.

1 kg = 1000 g	100 g	10 g	1 g
---------------	-------	------	-----

Capacity can relate to a place value because 10 mL is equal to ten 1 mL, 100 mL is equal to ten 10 mL, and 1 L is equal to 1,000 mL which is ten 100 mL.

1 L = 1000 mL	100 mL	10 mL	1 mL
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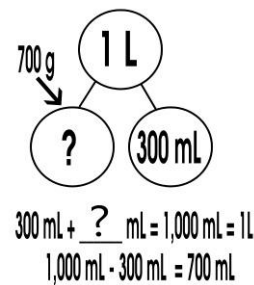
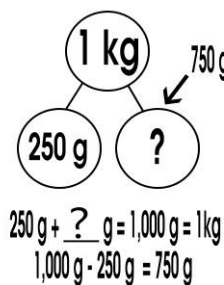
## OBJECTIVE OF TOPIC B

- 1 Build and decompose a kg to reason about the size and weight of 1 kg, 100 g, 10 g, and 1 g.  
Develop estimation strategies by reasoning about weight in kg of a series of familiar objects to establish mental benchmark measures.
- 2 Solve one-step word problems involving metric weights within 100 and estimate to reason about solutions.
- 3 Decompose a liter to reason about the size of 1 L, 100 mL, 10 mL, and 1 mL.
- 4 Estimate and measure liquid volume in L and mL using the vertical number line.
- 5 Solve mixed word problems involving all four operations with g, kg, L, and mL given the same units.
- 6

## Focus Area– Topic B

*Measuring Weight and Liquid Volume in Metric Units*

*Decomposing liters and kilograms using number bonds.*



Students should understand that 1 kg is equal to 1,000 g. If part of 1 kg (1,000 g) is 250 g then the other part (?) should equal to 1 kg (1,000 g).

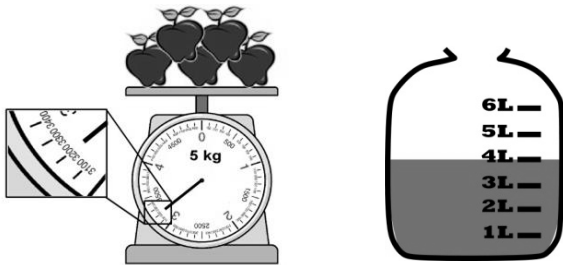
$$1,000\text{ g} - 250\text{ g} = 750\text{ g}.$$

They should also understand that 1 L is equal to 1,000 mL. If part of 1 L (1,000 mL) is 300 mL then the other part (?) should equal to 1 L (1,000 mL).

$$1,000\text{ mL} - 300\text{ mL} = 700\text{ mL}.$$

## Measuring with Scales and Beakers

Students will learn how to read a scale. The apples weigh 3,200 g. The beaker holds 4 L of liquid.



## Estimate Weight & Liquid Capacity



Students will learn how to estimate how much an item weighs. A small dog weighs about 4 kg. A bottle of soda is about a liter.

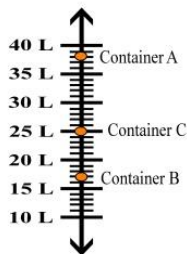


## Use a number line to record capacity

What is the difference between the capacity of Container A and Container C?

Look at the number line and record the amount of each container.

Container A	38 L
Container B	17 L
Container C	25 L



Subtract the amount in Container A from the amount in Container C to find the difference.

$$38 \text{ L} - 25 \text{ L} = 13 \text{ L}$$

The difference is 13 L.

## One-Step Addition Word Problem

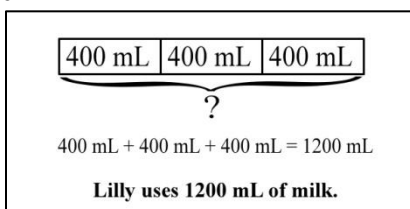
Jessie has 2 dogs. He feeds one dog 25 g of food and the other 35 g of food. How much dog food does Jessie feed his dog?

$$25 \text{ g} + 35 \text{ g} =$$

$$30 + 30 = 60 \text{ g}$$

Jessie feeds his dogs  
60 g of dog food.

A recipe requires 400 mL of milk. Lilly decides to triple the recipe for lunch. How many milliliters of milk does she need for lunch?



## One-Step Subtraction Word Problem

Kathy wants to ride the roller coaster. The minimum weight to ride is 33 kilograms. She weighs 13 kilograms less than the required weight. How many kilograms does Kathy weigh?

$$33 - 13 = \underline{\quad}$$
$$33 - 10 - 3 = 20 \text{ kg}$$

Take away with results unknown

Cindy gets a motor scooter that weighs 13 kilogram for her birthday. Before she opened it the box it weighed 17 kilograms. How much does the box weigh without the motor scooter in it?

$$17 - 13 = \underline{\quad}$$
$$17 - 10 - 3 = 4 \text{ kg}$$

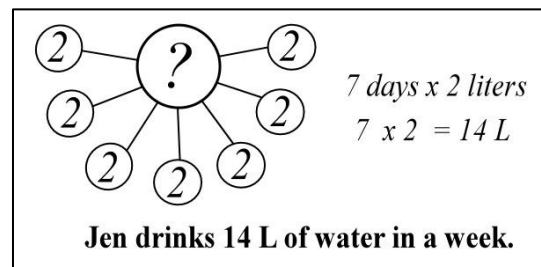
Take from with change unknown

Charlie weighs 72 kilograms. After exercising every day for 2 months he loses weight. He now weighs 68 kilograms. How much weight did Charlie lose?

$$72 - \underline{\quad} = 68$$
$$72 - 68 = 4 \text{ kg}$$

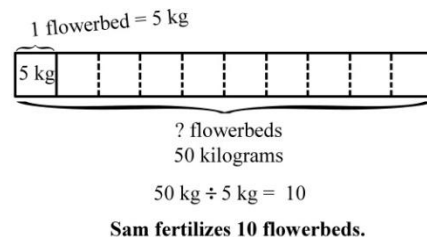
Equal Groups Result Unknown

Jen drinks 2 liters of water a day, how many liters of water does Jen drink in a week?



Results Known Groups Unknown

Sam purchases 50 kilograms of fertilizer for her flowerbeds. She needs 5 kilograms of fertilizer for each flowerbed. How many flowerbeds can she fertilize? Draw a tape diagram to solve.



Skip-counting by fives to 50 could be another way to solve this problem.



# MATH NEWS



LAFAYETTE  
PARISH SCHOOL SYSTEM

Grade 3, Module 2, Topic C

October 2013

## 3<sup>rd</sup> Grade Math

*Module 2: Place Value and Problem Solving with Units of Measure*

### Math Parent Letter

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Topic C. Rounding to the Nearest Ten and Hundred

### Vocabulary Words

- Halfway
- Round
- About
- Vertical
- $\approx$  Approximate
- Endpoint
- Point
- Plot
- Tick Marks

### Helpful Hints!

*Included in this newsletter are different questions that could be used to help students understand the concept of rounding.*

**Rounding to tens:** If the number ends with 5-9 then round up to the higher ten. Ex. 15 rounds to 20.

**Rounding to hundreds:** If the number ends with 50-99 then round to the higher hundred. Ex. 250 rounds to 300.

## OBJECTIVE OF TOPIC C

- 1 Round two-digit measurements to the nearest ten on the vertical number line.
- 2 Round two-digit and three-digit numbers to the nearest ten on a vertical number line.
- 3 Round to the nearest hundred on a vertical number line.

## Focus Area– Topic C

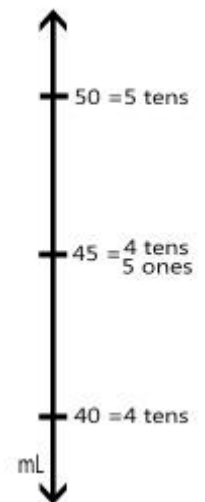
*Rounding to the Nearest Ten and Hundred*

*Draw a vertical number line. Plot 48 mL on the number line.*

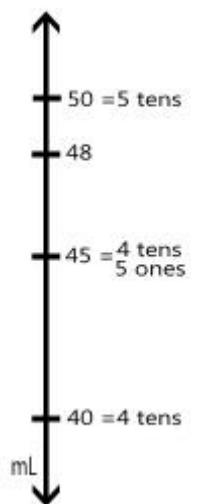
1. Numbers are continuous; to show this an arrow is drawn on both sides of the number line.
2. Place a **tick mark** at the top of the number line and the bottom of the number line. How many tens are in 48? 4 tens or 40. The lowest tick mark will be 40. What is 1 more ten than 4 tens? 5 tens or 50. The highest tick mark is 50.
3. Find the **halfway** point on the number line and put a tick mark. What number is halfway between 40 and 50? 45. Label the halfway point 45.

4. The number measured is 48 mL. So label the unit measured on the number line mL.
5. Now **plot** 48 mL on the number line. 48 is larger than 45 and smaller than 50, so the tick mark should be between those numbers. 48 is a little more than halfway between 45 and 50 so draw the tick mark a little more than halfway between the two numbers.
6. Look at the number line. What is the nearest 10 to 48? 50, so **round** 48 to 50.

### Label First



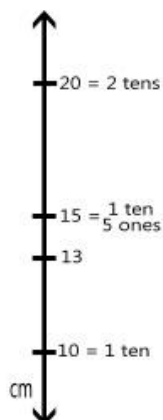
### Plot Next



## Rounding 13 cm to the nearest 10

Look at the number line and round to the nearest ten.

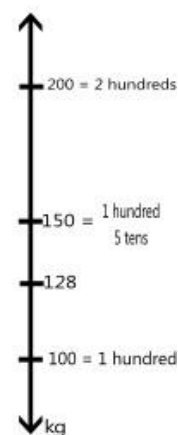
Is 13 more than halfway or less than halfway between 10 and 20? 13 is less than 15 and 15 is the number halfway between 10 and 20, so 13 is less than halfway. 13 should be rounded to 10 because it is less than halfway between 10 and 20. Another way to say this is 13 cm is about 10 cm. **About** means that it is not an exact amount.



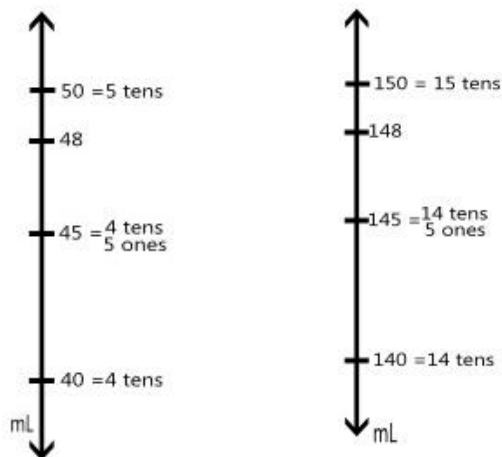
## Rounding 128 kg to the nearest 100

Look at the number line and round to the nearest hundred.

Is 128 more than halfway or less than halfway between 100 and 200? 128 is less than 150 and 150 is the number halfway between 100 and 200, so 128 is less than halfway. 128 should be rounded to 100 because it is less than halfway between 100 and 200. Another way to say this is 128 kg is approximately 100 kg. The symbol for **approximately** is  $\approx$ . So  $128 \text{ kg} \approx 100 \text{ kg}$ .

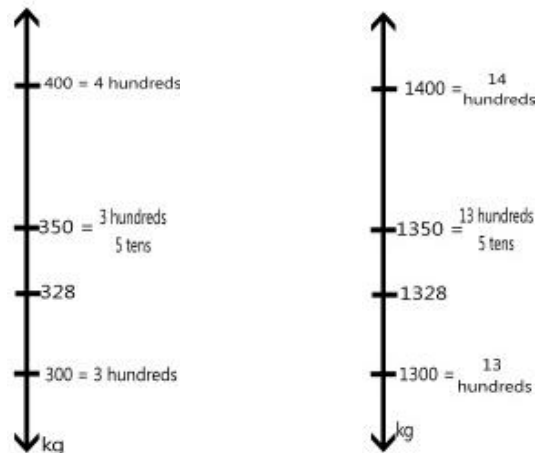


To round 48 to the nearest ten use the first number line. How will the endpoints change to round 148 to the nearest ten?



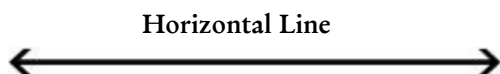
How many tens are in 148? 14 tens. What is 1 more ten than 14? 15 tens. What is the halfway point? 145. Is 148 more or less than 145? more. So 148 would round to 150.

To round 328 to the nearest hundred use the first number line. How will the endpoints change to round 1328 to the nearest hundred?

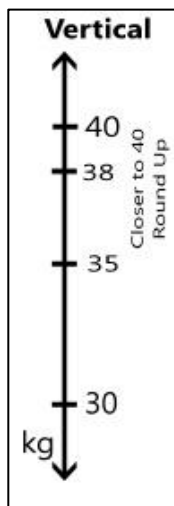


How many hundreds are in 1328? 13 hundreds. What is 1 more hundred than 13? 14 hundreds. What is the halfway point? 1350. Is 1328 more or less than 1350? less. So 1328 would round to 1300.

In previous units students used a horizontal number line to represent and understand numbers. A horizontal number line is drawn from left to right.

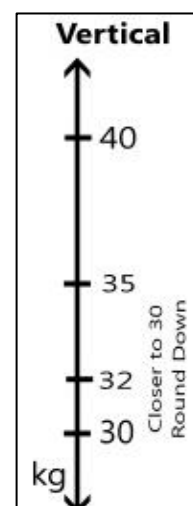


Students will now use a vertical number line. Vertical number lines are drawn up and down. A vertical number line is helpful when representing numbers that needed to be rounded. When plotting a number on a vertical number line the student can visually see which ten or hundred the number is closer to and also reminds the student to round UP or round DOWN. The same direction the number line is drawn.



38 rounds up to 40

32 rounds down to 30





# MATH NEWS



LAFAYETTE  
PARISH SCHOOL SYSTEM

Grade 3, Module 2, Topic D

October 2013

## 3<sup>rd</sup> Grade Math

*Module 2: Place Value and Problem Solving with Units of Measure*

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Topic D. Two- and Three-Digit Measurement Addition Using Standard Algorithm

### Vocabulary Words

- Standard Algorithm
- Place Value Chart
- Mental Math
- Reasonable
- Rename
- Regroup
- Precise
- Addends

### Helpful Hints!

$\approx$  Approximate      = Equals



## OBJECTIVE OF TOPIC D

- 1 Add measurements using the standard algorithm to compose larger units once.
- 2 Add measurement using the standard algorithm to compose larger units twice.
- 3 Estimate sums by rounding and apply to solve measurement word problems.

## Focus Area– Topic D

*Two- and Three-Digit Measurement Addition Using Standard Algorithm*

*Solve using a place value chart*

Tommy has a beaker with 34 mL of water and a beaker with 59 mL of water. If he pours the two beakers into one beaker, how much water would he have in that one beaker?

	tens	ones
34 mL	•••	••••
+ 59 mL	•••••	•••••
Combined	8 tens	13 ones

**Regroup** because 13 ones = 10 ones + 3 ones. To regroup, circle the 10 ones. To show that the 10 ones will be **renamed** to 1 ten, draw an arrow from the 10 ones to the tens place. Then draw a number disk in the tens place to represent 1 ten.

	tens	ones
34 mL	•••	••••
+ 59 mL	•••••	•••••
Combined	9 tens	3 ones

Now there are 9 tens and 3 ones which is equal to 93.

*Solve using standard algorithm*

Start with the ones place.  $9 + 4 = 13$ . Rename to 1 ten and 3 ones. Write the 1 so that it crosses the line under the tens in the tens place or above the 5 in the tens place (both are correct). Write the 3 below the line in the ones place. Add the tens place.  $5 + 3 + 1 = 9$ . Write the 9 below the line in the tens place. Don't forget to include the unit of measure in your answer.

$\overset{1}{5}9$	59
+ 34	+ 34
93	93

$$\begin{array}{r} 59 \text{ mL} \\ + 34 \text{ mL} \\ \hline 93 \text{ mL} \end{array}$$

Tommy has 93 mL of water if he combines the two beakers into one.

## Solve using Standard Algorithm

Casey ran for 55 minutes on Thursday. On Friday she ran for 29 minutes more than she ran on Thursday. How many total minutes did she run on Thursday and Friday?

First find out how many minutes she ran on Friday.

Thursday = 55 minutes

Friday = 55 minutes + 29 minutes

$$\begin{array}{r} 55 \text{ minutes} \\ + 29 \text{ minutes} \\ \hline 84 \text{ minutes} \end{array}$$

She ran 84 minutes on Friday

Next find out how many minutes she ran on Thursday and Friday together.

$$\begin{array}{r} \text{Casey ran 139 minutes total} \\ 84 \text{ minutes} \\ + 55 \text{ minutes} \\ \hline 139 \text{ minutes} \end{array}$$

## Solve using Mental Math

It takes Joey 13 minutes to mow the front lawn. It takes him 26 more minutes to mow the back lawn than it does to mow the front lawn. What is the total time Joey spent mowing the lawn?

Mentally add the ones.

$$\begin{array}{l} 6 \text{ ones} + 3 \text{ ones} = 9 \text{ ones} \\ 9 \text{ ones} = 9 \end{array}$$

Mentally add the tens.

$$\begin{array}{l} 2 \text{ tens} + 1 \text{ ten} = 3 \text{ tens} \\ 3 \text{ tens} = 30 \end{array}$$

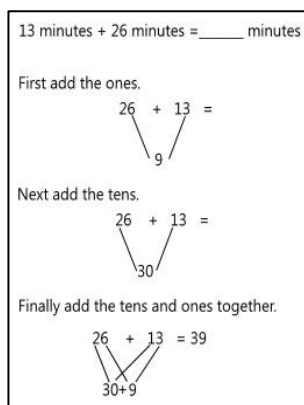
Mentally add the ones and tens together.

$$30 + 9 = 39$$

Joey mowed the front lawn in 13 minutes and the back lawn in 39 minutes. Add  $39 + 13$  to find out how many total minutes Joey mowed the lawn.

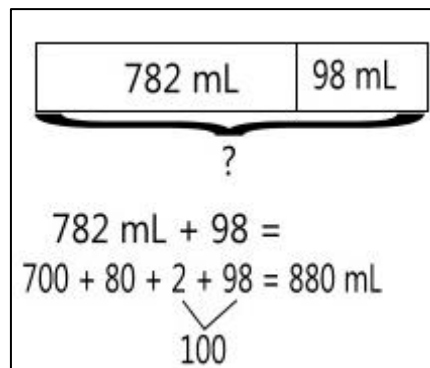
$$39 + 13 = 52$$

Joey mows the lawn for a total of 52 minutes.



## Draw a Tape Diagram to Solve

Tammy is making lemonade. She uses 782 mL of water and 98 mL of squeezed lemon juice. What is the capacity of the lemon juice and water?



The total capacity of Tammy's lemonade is 880 mL.

## Estimate the Sum by Rounding

Doug practices foot ball for 459 minutes the first week and 262 minutes the second week. Estimate the total time practiced in three different ways.

$$459 + 262 = 721$$

- a. Nearest Hundred  $500 + 300 = 800$
- b. Nearest Fifty  $450 + 250 = 700$
- c. Nearest Ten  $460 + 260 = 720$

Because the **addends** (numbers added together) are close to the halfway point between the rounding units, rounding to the nearest 10 of 50 would give a more **precise** estimate.

Only C could help check to see if the answer is **reasonable** (makes sense). If A or B was used the exact answer could be way off. A close estimate is needed to see if the actual sum is reasonable.

## Estimate the Sum

A black bear weighs 187 kilograms. Her cub weighs 73 kilograms. Estimate the total weight of the bear and her cub and then find the exact weight of the bear and her cub.

Estimated

$$\begin{array}{r} 187 + 74 \\ 190 + 70 = 260 \end{array}$$

The bear and her cub weigh  $\approx 260$  kg. The bear and her cub have an actual weight of 261.

Actual

$$187 + 74 = 261$$





# MATH NEWS



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Grade 3, Module 2, Topic E

October 2013

## 3<sup>rd</sup> Grade Math

*Module 2: Place Value and Problem Solving with Units of Measure*

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Topic E. Two- and Three-Digit Measurement Subtraction Using Standard Algorithm

### Vocabulary Words

**Minuends** – the quantity or number from which another is subtracted.

### Place Value Chart

hundreds	tens	ones

Borrowed is not a word commonly used in the classroom anymore, instead of borrowing students unpack or unbundle, and regroup.

## OBJECTIVE OF TOPIC E

- 1 Decompose once to subtract measurements including three-digit minuends with zero in the tens or ones place.
- 2 Decompose twice to subtract measurements including three-digit minuends with zeros in the tens and ones place.
- 3 Estimate differences by rounding and apply to solve measurement word problems.
- 4 Estimate sums and differences of measurements by rounding, and then solve mixed word problems.

## Focus Area– Topic E

*Two- and Three-Digit Measurement Subtraction Using Standard Algorithm*

*Solve using a place value chart*

Sabrina had 726 milliliters of water when she started her hiking trip. She has 182 milliliters of water after her hiking trip. How many milliliters of water did Sabrina drink?

726 - 182 = _____		
hundreds	tens	ones
7	2	6

726 - 182 = _____		
hundreds	tens	ones
5	4	4

Start with the ones. Can 2 ones be taken away from 6 ones? Yes, 6 ones – 2 ones = 4 ones. Move to the tens, can 8 tens be taken away from 2 tens? No! There are not enough tens to subtract so **unbundle** 1 hundred and create 10 tens. Now there are 12 tens. 12 tens – 8 tens = 4 tens. Can 1 hundred be taken away from 6 hundreds? Yes 6 hundreds – 1 hundred = 5 hundreds.

*Sabrina drank 544 mL of water on her hiking trip.*

*Solve using standard algorithm*

Start with the ones place. 6 ones – 2 ones = 4 ones. Now move to the tens place. Can 8 tens be taken from 2 tens? Unpackage 1 hundred for 10 tens. Now regroup and there are 12 tens. Can 8 tens be taken away from 12 tens? Yes 12 tens – 8 tens = 4 tens. Now move to the hundreds place. Because 1 hundred was unpacked from 7 hundreds, there are 6 hundreds left. Can 1 hundred be taken from 6 hundred? Yes, 6 hundreds – 1 hundred = 5 hundreds.

$$\begin{array}{r}
 6 \overline{) 726} \\
 \underline{- 182} \\
 4
 \end{array}$$

$$\begin{array}{r}
 6 \overline{) 726} \\
 \underline{- 182} \\
 544
 \end{array}$$

*Sabrina drank 544 mL of water on her hiking trip. This word problem can be solved in more than one way.*

## Two- Step: Solve by Decomposing

Casey ran for 50 minutes on Thursday. On Friday she ran for 19 minutes less than she ran on Thursday. How many total minutes did she run on Thursday and Friday?

First find out how many minutes she ran on Friday.

Decompose the 50 into 30 and 20. Subtract the 19 from the 20.  $20 - 19 = 1$ . The numbers left are 30 and 1.  $30 + 1 = 31$ . She ran 31 minutes on Friday.

Thursday = 50 minutes  
Friday = 50 minutes - 19 minutes

$$\begin{array}{r} 50 \\ -19 \\ \hline 31 \end{array}$$

She ran 31 minutes on Friday

Next find out how many minutes she ran on Thursday and Friday together.  $50 + 31 = 81$  She ran 81 minutes total.

## Draw a Tape Diagram to Solve

Tammy went to the fruit stand. She bought 682 grams strawberries on Monday. On Tuesday she buys 273 grams of strawberries. How many more strawberries did Tammy buy on Monday than on Tuesday?

682 g
273 g

?

$$\begin{array}{r} 7\ 12 \\ 682 \\ -273 \\ \hline 409 \end{array}$$

Tammy bought 409 g more strawberries on Monday than on Tuesday.

## Draw a Tape Diagram to Solve

John has to drive from Lafayette to New Orleans. The total distance is 294 kilometers. John has 85 kilometers left to drive, how many kilometers did John drive so far?

294 km
85 km

?

$$\begin{array}{r} 8\ 14 \\ 294 \\ -85 \\ \hline 209 \end{array}$$

John drove 209 km

## Estimate the 449 - 262 by Rounding

$$449 - 262 = 187$$

- |                    |                   |
|--------------------|-------------------|
| a. Nearest Hundred | $400 - 300 = 100$ |
| b. Nearest Fifty   | $450 - 250 = 200$ |
| c. Nearest Ten     | $450 - 260 = 190$ |

Only C could help check to see if the answer is **reasonable** (makes sense). If A or B was used the exact answer could be way off. A close estimate is needed to see if the actual sum is reasonable.

## Subtract Using Mental Math Strategies

Strategy 1: "Breaking up Tens and Ones" - Abstractly:

$$\begin{array}{r} 57 - 18 = 39 \\ 47\ 10 \\ -10\ -8 \\ \hline 37\ 2 \end{array}$$

Equations:

$$\begin{aligned} 57 - 18 \\ &= (47 - 10) \text{ and } (10 - 8) \\ &= 37 + 2 \\ &= 39 \end{aligned}$$

Strategy #3 Compensation: "Uncle and Nephew"

Equations:

$$\begin{aligned} 57 - 18 \\ +2\ +2 \\ = 59 - 20 \\ = 39 \end{aligned}$$

Strategy 4: "Rounding Numbers":

Equations:

$$\begin{aligned} 57 - 18 \\ &= 57 - 20 + 2 \\ &= 39 \end{aligned}$$

Strategy 2: "Breaking up the 2<sup>nd</sup> term"

Number Bonds:

$$\begin{array}{r} 57 - 18 \\ 17\ 1 \end{array}$$

Equations:

$$\begin{aligned} 57 - 18 \\ &= 57 - 17 - 1 \\ &= 40 - 1 \\ &= 39 \end{aligned}$$

Strategy 5: "Number Lines":

